

EFIC5-0489

Basic Science (Anatomy/physiology/pharmacology/behaviour): Primary Afferents

TRPV1-DEPENDENT MENINGEAL NEUROGENIC SENSORY VASODILATATION IS ATTENUATED IN DOXORUBICIN-TREATED RATS

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Background and aims: Doxorubicin is a potent antitumor drug with severe cardiotoxic and neurotoxic effects. Previous findings in our laboratory demonstrated an interplay between doxorubicin and chemosensitive primary afferent neurons which express the transient receptor potential vanilloid type 1 receptor (TRPV1). The aim of the present study was to examine the effect of doxorubicin treatment on the functions of meningeal chemosensitive nerves implicated in the pathomechanism of headaches.

Methods: Adult male Wistar rats were treated with doxorubicin (cumulative dose: 15 mg/kg). Changes in dural blood flow induced by TRPV1 activation with capsaicin were measured with laser Doppler flowmetry in an *in vivo* open cranial window preparation. Calcitonin gene related peptide (CGRP) release was measured with ELISA in an *ex vivo* dura mater preparation. Immunohistochemistry was employed to study the innervation of the dura mater.

Results: In control rats, stimulation of meningeal nociceptive afferents by capsaicin elicited a significant increase in blood flow. This effect of capsaicin was reproducible: three consecutive applications of the drug produced similar responses. In doxorubicin-treated animals, the vasodilatory effect of capsaicin was significantly reduced. Doxorubicin treatment also resulted in significant reductions in the vasodilatory effect of CGRP and the capsaicin-induced release of CGRP. Immunofluorescence studies showed similar densities of innervation by TRPV1- and CGRP-positive nerve fibers in control and doxorubicin treated rats.

Conclusions: The present findings indicate profound impairments of vasomotor and nociceptive functions of meningeal chemosensitive afferent nerves following doxorubicin treatment which may contribute to pathologies associated with antineoplastic therapy.

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THE ROLE OF A- AND C-FIBER PRIMARY AFFERENT NEURONS IN THE RAT SPINAL MICROGLIAL RESPONSE TO PERIPHERAL NERVE INJURY

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Background and aims: Peripheral nerve injury-induced reactive microgliosis and glia-neuron interactions in the spinal dorsal horn are regarded as important pathogenetic factors of neuropathic pain. In order to identify subpopulations of spinal primary afferents which initiate microgliosis, the effects of neurotmesis and C-fibre specific chemodenervation were compared in the rat.

Methods: In adult male Wistar rats the sciatic nerve was either transected (neurotmesis) or treated perineurally with capsaicin (1%) to produce selective C-fibre chemodenervation. Two weeks later, the animals were sacrificed and sections of the lumbar spinal cord were processed for the demonstration of microglia and C-fiber primary afferents using OX42-immunohistochemistry and *Bandeiraea simplicifolia* isolectin (IB4) histochemistry. Quantification of the microglia response was performed in thin optical sections obtained with the aid of a laser-scanning confocal microscope and an image analysis software.

Results: Following peripheral nerve transection robust somatotopically localized microgliosis was observed within the spinal dorsal horn. The density of microglial processes increased significantly by $237 \pm 36\%$ and $525 \pm 78\%$ in laminae I-II and in laminae III-X, respectively, as compared to the contralateral control side. In contrast, perineural capsaicin treatment resulted only in small increases of microglial density by $58 \pm 22\%$ and $59 \pm 17\%$ in laminae I-II and in laminae III-X, respectively.

Conclusions: The present findings indicate a principal role of A-fiber primary afferent neurons in the initiation of the nerve injury-induced spinal microgliosis and neuropathic pain. Since perineural capsaicin treatment produces selective damage to populations of C-fiber afferents, spinal microgliosis cannot be regarded as a reliable biomarker of nerve injury.

PROPERTIES OF VGLUT3-POSITIVE SENSORY FIBRES INVOLVED IN OXALIPLATIN-INDUCED HYPERSENSITIVITIES

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Background and Aims:

Chemotherapy is frequently associated with severe side effects, such as mechanical or thermal pain hypersensitivity. These adverse events are difficult to treat as they respond poorly to pharmaceutical therapies. Recent data from our lab has shown that a class of non-nociceptive sensory afferents, characterized by their expression of the vesicular glutamate transporter, subtype 3 (VGLUT3⁺) is involved in mechanical and cold hypersensitivity induced by the chemotherapeutic agent oxaliplatin. Aims of the present study were to define and characterize potential subpopulations within the VGLUT3⁺ fibre population and to identify pharmaceuticals inhibiting neurotransmitter release from VGLUT3⁺ sensory fibres.

Methods:

We performed immunohistochemistry, *in-situ* hybridization, and patch-clamp recordings in spinal cord slices of transgenic mice, expressing the light-activated Channelrhodopsin-2 in VGLUT3⁺ neurons.

Results:

Our data show that VGLUT3⁺ sensory fibres are monosynaptically connected to lamina I projection neurons and consist of at least three subpopulations: 1) A-fibres, likely developmentally expressing VGLUT3; 2) tyrosine hydroxylase (TH) expressing C-LTMRs, putatively innervating lamina II neurons; and 3) TH-negative C-fibres, expressing the cold-sensitive transient receptor potential melastatin 8 channel. The μ -opioid receptor agonist DAMGO (0.5 μ M) inhibited VGLUT3⁺ C-fibres innervating spinal dorsal horn lamina I neurons much stronger than C-fibres innervating lamina II neurons or VGLUT3⁺ A-fibres. The δ -opioid receptor agonist SNC80 (50 μ M) generally had marginal effects while the GABA_B receptor agonist baclofen (1 μ M) strongly inhibited all fibre populations investigated.

Conclusions:

We conclude that GABA_B receptors are a more promising target than μ - or δ -opioid receptors in oxaliplatin-induced mechanical and cold hypersensitivities.

EFIC5-0610

Basic Science (Anatomy/physiology/pharmacology/behaviour): Primary Afferents

VGLUT3 EXPRESSING PRIMARY AFFERENTS CONTRIBUTE TO OXALIPLATIN-INDUCED MECHANO-COLD HYPERSENSITIVITY

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Background and aims:

Mechanical- and cold- hypersensitivity are common attendant-symptoms of various neuropathies. Most notably over the administration of oxaliplatin, a chemotherapeutic agent used to treat colorectal-cancer, patients frequently develop a mechano-cold hypersensitivity which includes a cumulative aggravation over the cyclic application pattern. Recently, a subpopulation of primary afferents, characterised by the expression of the vesicular glutamate transporter 3 (VGLUT3), has been described. These fibres are able to detect mechano-cold stimuli, which are the prime modalities affected by oxaliplatin-treatment. Therefore, the aim of the present study was to elucidate the role of VGLUT3⁺ primary afferents in oxaliplatin-induced neuropathic pain.

Methods:

We performed immunohistochemical analysis of dorsal root ganglia and behavioural tests for mechanical and thermal thresholds in wild-type and VGLUT3 knock-out mice. In addition, we tested the responsiveness of VGLUT3⁺ afferents electrophysiologically and on a behavioural level in mice selectively expressing the light activated ion-channel Channelrhodopsin2 in VGLUT3⁺ fibres.

Results:

Our study revealed a strong mechanical- and cold-hypersensitivity in WT mice upon oxaliplatin treatment, but an impaired development of these hypersensitivities in VGLUT3-KO mice. When selectively stimulated optogenetically, VGLUT3⁺ fibres mediated mild behavioural responses in naïve mice, but were sufficient to mediate nocifensive reactions in mice treated with oxaliplatin. Additionally, we found that VGLUT3⁺ fibres express transient receptor potential melastatin 8 (TRPM8), the prime detector of environmental cold, and that their synaptic transmission is facilitated by a TRPM8-agonist.

Conclusion:

We conclude that VGLUT3 expressing primary afferents contribute to the development of mechanical and cold hypersensitivity in the oxaliplatin-induced neuropathy.

EFIC5-0620

Basic Science (Anatomy/physiology/pharmacology/behaviour): Primary Afferents

NOCICEPTIN/ORPHANIN FQ OPIOID PEPTIDE RECEPTOR PROTEIN EXPRESSION IN NORMAL HUMAN SKIN

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Background and aims: Peripheral nociceptin/orphaninFQ opioid peptide (NOP) receptors have been shown to modulate nociception in rodents and non-human primates. Here, we studied peripheral NOP receptor protein expression in normal human skin to investigate whether their cellular localization is in line with a presumed nociceptive function in humans.

Methods: An antibody raised against human NOP receptor was used in combination with antibodies against PGP9.5, CGRP and 200kD neurofilament protein to assess the distribution of NOP receptor immunolabeling (IL) in 3mm punch biopsies of normal human glabrous and hairy skin from the hands of 5 healthy volunteers.

Results: NOP receptor was densely and consistently expressed on the superficial-most stratum of live epidermal keratinocytes (stratum granulosum) previously shown to express several varieties of neurotransmitters and receptors implicated in inhibitory and excitatory activation or modulation of C and A δ fiber sensory endings terminating in or near the epidermis. Distinct but faint NOP receptor-IL was detected on the deepest layer of keratinocytes (stratum basalis) that express signaling molecules implicated in excitatory mechanisms and cytogenesis. NOP receptor-IL was also detected among C fiber endings in the epidermis and upper dermis that lack CGRP and likely A δ and A β fiber endings, the latter terminating in Meissner corpuscles and as lanceolate endings on hair follicles that are rapidly adapting low threshold mechanoreceptors.

Conclusions: These results suggest that NOP receptors in human skin may participate directly or indirectly in the modulation of innervation implicated in nociception, thermoreception as well as low threshold mechanoreception.

REGULATION OF THE BLOOD-NERVE BARRIER BY RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR FOR PERINEURIAL APPLICATION OF HYDROPHILIC OPIOIDS OR NAV1.7 BLOCKER

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The perineurium surrounding the peripheral nerve and endoneurial vessels form the blood-nerve barrier. The perineurial barrier is sealed by tight junction proteins like claudin-1 preventing e.g. application of analgesics for selective regional pain control. Claudin-1 expression is regulated via low-density lipoprotein receptor related protein (LRP-1). Application of the LRP-1 agonist metalloproteinase 9 leads to downregulation of claudin-1 via Erk phosphorylation. Here, we examined recombinant tissue plasminogen activator (rtPA) as an agonist for LRP-1 to open the blood-nerve barrier for the treatment with hydrophilic analgesics.

Application of rtPA as well as the catalytically inactive rtPAi downregulated claudin-1 mRNA, protein and immunoreactivity in the perineurium of the sciatic nerve for up to 5 d in Wistar rats (approved by the local animal care committee). Local application of opioids or the Nav1.7 blocker Protoxin-II was only effective together with rtPA or rtPAi. No nerve degeneration or macrophage infiltration was observed. rtPA-induced barrier opening was mediated via Erk phosphorylation and inhibited by LRP-1 antagonists like RAP. In colonic epithelial cells, HT-29/B6, rtPA reduced the transepithelial resistance. Blood-nerve barrier closure after 5 d occurred via the increased transcription factors b-catenin and caudal homeobox (cdx)-2 but not Snail leading to upregulation of claudin-1 mRNA and protein.

rtPA opens the blood-nerve barrier via LRP-1 and pErk and closes the barrier via b-catenin and cdx-2. This mechanism could be used to facilitate drug delivery or, potentially, reseal the barrier under pathologic conditions.

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CONTROL OF MENINGEAL BLOOD FLOW BY NO-H₂S-HNO-TRPA1-CGRP SIGNALLING AND ITS IMPLICATION FOR VASCULAR HEADACHES

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Background and aims: Calcitonin gene-related peptide (CGRP) and nitric oxide (NO) released in the cranial dura mater mediate meningeal blood flow elevation possibly linked to vascular headaches. Thereby nitroxyl (HNO), generated by the reaction of NO with hydrogen sulfide (H₂S), may be the main vasodilatory mediator. We investigated the involvement of HNO in meningeal blood flow and CGRP release.

Methods: Blood flow was recorded by laser Doppler flowmetry around rat meningeal arteries. CGRP release from the dura mater in the hemisected rat head was quantified using ELISA. NO and H₂S were localised in the dura mater using histochemical methods with specific sensors.

Results: Upon topical administration of the NO donor DEA-NONOate the blood flow increased by 30%. This response was reduced by preadministration of oxamic acid, an inhibitor of H₂S synthesis. The H₂S precursor Na²S increased the flow by 20%. This effect was abolished by the TRPA1 antagonist HC030031 or the CGRP receptor antagonist CGRP⁸⁻³⁷ and reduced after inhibition of endogenous NO synthesis by L-NMMA. Na²S caused dose-dependent CGRP release, facilitated by co-administration of DEA-NONOate. Inhibition of endogenous NO or H₂S synthesis lowered basal CGRP release. NO, H₂S and HNO were histochemically localised to arterial vessels and perivascular nerve fibre bundles. HNO staining was lost after pretreatment with L-NMMA and oxamic acid.

Conclusions: HNO formed by NO and H₂S increases meningeal blood flow through activation of TRPA1 receptor channels and subsequent CGRP release. This signalling cascade activating TRPA1 receptors of trigeminal afferents may be involved in primary headaches.

RELATIONSHIP OF PERK-ACTIVATED SPINAL NEURONS WITH NORMAL AND INJURED L5 PRIMARY AFFERENTS IN RESPONSE TO NOXIOUS HEAT STIMULI APPLIED TO HIND PAW

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Background and Aims

The skin of the hind paw of the rat is innervated mainly by L4-L5 nerves. Rats develop hyperalgesia and allodynia in the hind paw after L5 nerve ligation and transection. We investigated the relationship between normal and injured L5 primary afferents and activated spinal neurons in response to noxious heat stimuli.

Methods

Left L5 spinal nerve was ligated and sectioned in rats. After 3 days, both hind paws were immersed in water at 52°C. Sections from L3-L6 spinal segments were stained immunocytochemically for phosphorylated Extracellular Regulated Kinases (pERK) as a pain marker and one of the following: Isolectin (IB4), calcitonin gene related peptide (CGRP), vesicular glutamate transporter1 (VGLUT1), as markers for normal unmyelinated C, thin myelinated A δ and myelinated A β primary afferents respectively, the injected mixture of IB4 and cholera toxin B (CTb) to identify injured unmyelinated and myelinated afferents and vasoactive intestinal polypeptide (VIP) as a marker for injured unmyelinated primary afferents.

Results

pERK immunoreactivity was not detectable in the normal spinal cord but activated in neurons after noxious heat stimulation. pERK positive neurons overlapped with CGRP- and IB4-immunoreactive nerve terminals in laminae I-II with no overlap with VGLUT1 or CTb-transganglionically transported immunoreactivities in deep laminae. The pERK heat-activated neurons in L4 and L5 spinal segments intermingled with IB4-transganglionically transported and up-regulated VIP immunoreactive fibers.

Conclusion

Our data demonstrate that L4 spinal neurons receive primary afferents of both injured and uninjured nerves and might be significant in the production of heat hyperalgesia after L5 injury.

CONTRIBUTION OF THE BV8/PK SYSTEM ACTIVATION IN THE G-CSF (GRANULOCYTES-COLONY STIMULATING FACTOR) INDUCED PAIN

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G-CSF is a current therapy to increase neutrophil counts in patients after chemotherapy, nevertheless pain is a common side effect. G-CSF is the major inducer of the new chemokine Bv8/PK2 expression in bone marrow mononuclear cells (BMMC) and in circulating and tissue-infiltrating granulocytes (1). PK2 released from inflammatory granulocytes is a main mediator of pain through activation of its receptors, PKR1 and PKR2 (2).

Aim: Aim of our research was to verify whether G-CSF-induced pain could be related to increased PK2 expression and release and whether G-CSF-induced pain could be reduced antagonizing the Bv8/PK system.

Methods and results: In 8 female patients bearing breast cancer, subjected to intravenous chemotherapy, G-CSF treatment (Pegfilgrastim, 100 mg/Kg, s.c.) induced a significant increase in granulocyte PK2-mRNA (RT-PCR) and in serum PK2-protein levels (ELISA). The low number of patients impaired us to obtain a significant temporal correlation between PK2 serum levels and painful state; hence we performed a translational experiment in mice.

In mice, repeated administrations of G-CSF (10 µg s.c.) also induced a significant decrease in base-line allodynic threshold that temporally correlated with the increase in BMMC PK2-mRNA and PK2 serum levels (1). Acute and chronic treatment with the PKR antagonist, PC1 abolished allodynia.

Conclusions: Our data correlate G-CSF induced allodynia with activation of the Bv8/PK system, at least in mouse, and demonstrate that blocking PKR might be a promising therapeutic strategy to control G-CSF-induced pain in cancer patients.

References:

- 1) Shojaei et al. (2007). *Nature*, 450:825-831.
- 2) Giannini et al., (2009). *PNAS*, 106:14646-14651.

THE GRANULOCYTES-DERIVED CHEMOKINE BV8/PK2 IS INVOLVED IN G-CSF INDUCED PAIN

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Granulocyte-colony stimulating factor (G-CSF) is commonly employed to reduce the risk of chemotherapy-induced neutropenia in cancer patients, however pain is relevant side effect. G-CSF is the major inducer of the chemokine Bv8/PK2 in inflammatory granulocytes¹. Bv8/PK2, through GPCR, PKR1 and PKR2, produces pro-algesic and pro-inflammatory effects^{2, 3}. Receptors and signaling mediators of G-CSF are functionally expressed on DRG neurons⁴.

Aim: To verify, in mice, whether thermal hyperalgesia induced by intraplantar (i.pl.) administration of G-CSF is mediated by Bv8/PK2 system.

Methods: We evaluated thermal hyperalgesia (TH, plantar-test), induced by i.pl. increasing doses of G-CSF, in WT, PKR1-KO and PKR2-KO mice and the ability of a PKR₁-antagonist (PC1) and of a TRPV1 antagonist (NF1-56 HCl) to abrogate G-CSF-induced thermal hyperalgesia. Number of circulating granulocytes (Burker-chambre), PK2-mRNA (RT-PCR) and granulocyte-recruitment (myeloperoxidase-assay) in G-CSF or saline injected paw were assessed 4 h after injection.

Results: *In WT and in PKR₂-KO mice G-CSF (300ng) induced TH for 8h, whereas PKR1-KO mice were significantly less sensitive (>1 mcg vs 300ng). PC1 (50 ng) antagonized G-CSF-induced TH in WT and in PKR2-KO mice, whereas it was inefficacious (up to 500ng) in PKR1-KO mice. The TRPV1 antagonist, NF1-56-HCl (50ng), antagonized TH in all three genotypes.*

Conclusions: Our results underlay positive cooperation of PKR1 in G-CSF-induced hyperalgesia. Because PKR1 cooperates with TRPV1² we suppose a crosstalk between G-CSFR and PKR1 via TRPV1 sensitization.

- 1) Shojaei et al., (2007). *Nature*,450:825-831.
- 2) Negri et al., (2007). *LifeSciences*,81:1103–1116.
- 3) Giannini et al., (2009). *PNAS*,106:14646-14651.

INHIBITION OF COLLATERAL SPROUTING OF C-FIBER AFFERENTS BY PERSISTENT MYELINATED AXONS IN THE CHEMODENERVATED RAT SKIN

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Background and aims: Methods for long-term follow-up of functional cutaneous nerve regeneration are limited. This study employed laser Doppler perfusion imaging (LDI) of the sensory neurogenic vasodilatory response for the longitudinal investigation of cutaneous reinnervation.

Methods: The right saphenous nerve of adult male Wistar rats was either transected or treated perineurally with capsaicin (1%) under anaesthesia. Three to sixty days later LDI was used to capture perfusion images of the dorsal skin of the hindpaws before and after the topical application of mustard oil (5%).

Results: Transection or perineural capsaicin treatment of the saphenous nerve resulted in substantial decreases of mustard oil-induced vasodilatation in the medial part of the dorsal hindpaw skin already 3 days postoperatively (control: $71.0 \pm 21.9\%$, transected: $24.6 \pm 13.8\%$, capsaicin: $31 \pm 11.3\%$). Twelve to 20 days after neurotmesis but not perineural capsaicin, the vasodilatory responses showed marked progressive recovery towards control values in the saphenous skin area bordering the innervation territory of the sciatic nerve. However, if the the capsaicin treated nerve was transected 30-50 days postoperatively, a significant restitution of the vasodilatory response was observed in the previously chemodenedervated skin area.

Conclusions: This study demonstrates that LDI is a reliable technique for the longitudinal study of cutaneous nerve regeneration. The findings show the reinnervation of the denervated skin by collateral sprouting after neurotmesis but not perineural capsaicin. In the chemodenedervated skin, collateral reinnervation developed only after transection of the capsaicin-treated (saphenous) nerve indicating a hitherto unrecognized inhibitory effect of persistent capsaicin-insensitive, most probably myelinated sensory axons.
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EPIDERMAL NERVE FIBRE DENSITY REDUCTION AS A FUNCTION OF APPLICATION-TIME OF TOPICAL CAPSAICIN

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Background and aims

Topical capsaicin is approved for the treatment of peripheral neuropathic pain. Single application of high-dose and repetitive administration of low-dose capsaicin demonstrated an analgesic effect. Pain relief is associated with reversible reduction of epidermal-nerve-fibre-density (ENFD) often described as degeneration. In literature reduction of ENFD is documented mainly following one brief high-dose capsaicin application. Nevertheless articles reporting loss of ENFD following one single low-dose capsaicin administration exist.

We aimed to verify a dose-effect relationship between application-time of capsaicin (high-dose and low-dose) and ENFD-reduction as a surrogate for related pain relief.

Methods

Each thigh of 12 healthy volunteers was divided in six application-areas. Five 3x3cm pieces of a capsaicin-8%-patch were applied to one thigh. On the other thigh five blobs of capsaicin-0.05%-cream were administered and covered with a 3x3cm plaster. On each thigh one application-area remained untreated as control-area. According to randomisation after distinct points of time (15, 30, 45, 60, 120 minutes) one capsaicin-8%-patch and one blob of capsaicin-0.05%-cream were removed respectively. One week later a skin biopsy of every application-area was taken for evaluation of ENFD-reduction, whereas the untreated areas served as reference biopsies.

Results

For both capsaicin dosages ENFD-reduction did not correlate with application-time.

Following the administration of capsaicin-8%-patch ENFD was significantly reduced (>60%) in the 120-minutes application-area ($p < 0.037$), in contrast to capsaicin-0.05%-cream ($p < 0.487$).

Conclusions

Using ENFD-reduction as a parameter for the effect of topical capsaicin no dose-effect relationship could be proven. Other ways of evaluating the effect of capsaicin are required to illuminate discrepancy of data.

ANTIHYPERALGESIC EFFECT OF SEMICARBAZIDE SENSITIVE AMINE OXIDASE (SSAO) INHIBITORS IN AN ANIMAL MODEL OF NEUROPATHIC PAIN VIA POTENTIAL MODULATION OF TRPA1 CHANNELS

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Background and aims

Transient receptor potential channel ankyrin 1 (TRPA1) is a cation channel functioning as one of the key noxious transducers of polymodal nociceptors. TRPA1 is activated by noxious cold, irritant compounds such as mustard oil and various reactive aldehydes. The latter can be generated by endogenous processes, one of which is the widely-expressed semicarbazide sensitive amine oxidase (SSAO). The aim of the present study was to assess the effect of SSAO inhibitors in a traumatic mononeuropathy model in rats and in TRPA1^{+/+} and TRPA1^{-/-} mice.

Methods

The mechanonociceptive threshold of male Wistar rats or TRPA1^{+/+} and TRPA1^{-/-} mice was measured by a dynamic plantar aesthesiometer. Under anaesthesia, the sciatic nerve was partially ligated on one side. Seven days after nerve lesion SSAO inhibitors SZV-1287 or SZV-1911 were administered at a dose of 20 mg/kg i.p. and mechanical thresholds were measured 15 min afterwards.

Results

The mechanonociceptive threshold was decreased by 40-50% compared to pre-operation values in rats and mice, likewise. In rats, SZV-1287 or SZV-1911 significantly decreased neuropathic mechanical hyperalgesia by 31% and 29%, respectively. In wild-type mice, an antihyperalgesic effect of similar magnitude was revealed which was absent in gene-deleted mice.

Conclusions

The present results suggest that SSAO products are involved in the development of traumatic mechanical hyperalgesia via activation/sensitization of TRPA1. It is a new mechanism of endogenous TRPA1 activation and a potential novel drug target for neuropathic pain treatment.

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EFIC5-0634

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

THE ROLE OF FAAH POLYMORPHISM IN EXPERIMENTAL AND POSTOPERATIVE PAIN IN 1000 WOMEN UNDERGOING SURGERY FOR BREAST CANCER

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Background and Aims: Fatty Acid Amide Hydrolase (FAAH) metabolizes the endocannabinoid anandamide, an important mediator in nociception. The activity of FAAH has been hypothesized to affect pain sensitivity in humans, but the matter has not been addressed clinically. Our aim was to investigate the role of common *FAAH* single nucleotide variants (SNPs) in experimental and postoperative pain.

Methods: 1.000 women undergoing surgery due to breast cancer were preoperatively tested for cold and heat pain sensitivity. Patients pain intensities and analgesic consumption were recorded postoperative in the postanesthesia care unit, on the ward and at home during first week after discharge. *FAAH* polymorphisms were genotyped from all individuals. Eight *FAAH* SNPs and nine pain phenotypes were analyzed using linear regression.

Results: Two of the eight SNPs (rs324420 and rs1571138) were in tight 98% linkage disequilibrium. These SNPs showed significant associations to experimental cold pain and a nominal association to oxycodone consumption. Rs3766246 and rs4660928 showed associations to cold pain, though they remained nominal. Rs324425 showed a nominal association to pain intensity on the first day after discharge.

Conclusions: In our study *FAAH* SNPs were shown to alter cold pain sensitivity. Some minor effects were also seen in oxycodone consumption and pain intensity on the 1st day after discharge. The strongest associations were seen with cold pain and a known missense variant, rs324420. This variant has been shown to reduce *FAAH* activity potentially resulting in higher anandamide concentrations in the synaptic cleft.

EFIC5-0651

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

THE EFFECT OF DIFFUSE NOXIOUS INHIBITORY CONTROLS ON SPINAL REFLEXES IN THE MONOSODIUM IODOACETATE MODEL OF OSTEOARTHRITIS PAIN

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Background and aims

Human experimental evidence suggests descending inhibitory pathways are less effective in symptomatic osteoarthritis (OA). The present study therefore investigated the efficacy of diffuse noxious inhibitory controls (DNIC) in the rat monosodium iodoacetate (MIA) model of OA pain.

Methods

MIA (1mg/50µl; n=5) was injected into the left knee joint of male Sprague-Dawley rats; control rats received an injection of 50µl sterile saline (n=6). Pain behaviour was monitored over 28 days to assess weight bearing asymmetry and mechanical allodynia. Subsequently, under alfaxalone anaesthesia, electromyograms were measured in flexors tibialis anterior (TA) and biceps femoris (BF) as well as the extensor medial gastrocnemius (MG) following electrical stimulation of the lateral toe or heel respectively. Activation of DNIC by capsaicin (5mg/ml i.m.) into the contralateral forelimb or hindlimb was compared between groups.

Results

At day 28, ipsilateral hindlimb weight bearing was significantly reduced in MIA versus saline rats ($40 \pm 1.3\%$ vs. $50 \pm 0.1\%$, $p < 0.0001$). Mechanical allodynia was significant over 28 days ($p < 0.05$). For both groups, capsaicin injected at either site induced significant inhibition to $< 10\%$ controls ($p < 0.05$) for flexors BF and TA, but not MG. However, for BF responses in particular, this inhibition appeared less robust in MIA compared to saline rats with duration being significantly shorter (51 ± 4 min and 63 ± 0 min respectively, $p < 0.05$) following the contralateral hindlimb injection.

Conclusions

These data provide evidence for a reduction in DNIC efficacy in the MIA model during established pain behaviour hence suggest that descending inhibition may be less effective in chronic OA pain.

EFIC5-0760

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

A FMRI STUDY COMPARING THE PAIN INHIBITING EFFECTS OF STRESS AND DISTRACTION.

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Background and aims

The experience of pain is modulated by contextual variables such as acute stress (e.g. Yilmaz et al. (2010). Pain, 151, 522-529.). This study investigated the effects of stress and distraction on pain perception.

Methods

17 healthy persons (7 males; mean age = 47.5 years; SD = 16.3) participated in the experiment. They were examined on two days in two different conditions: stress (difficult mental arithmetic) and distraction (finding a double number in a row of numbers). Pain and tolerance thresholds were measured before and after both conditions. In addition pain ratings and functional magnetic resonance imaging were performed during blocks of painful stimuli. Heart rate, blood pressure and stress ratings were also obtained.

Results

The stress compared to the distraction condition elicited significantly more physiological reactivity and higher stress ratings. Pain threshold and tolerance increased after both conditions; $F=42.212$, $p < 0.001$) but without a differential effect. The brain activation patterns in both conditions were also similar and showed activations in regions like the insula and anterior cingulate cortex for both conditions.

Conclusions

Acute stress as well as cognitive activity serves to decrease pain perception. Our initial analyses show similar effects although one condition was clearly perceived as stressful and the other was not. We will perform further analyses to delineate potential differences between the two conditions; however, it is possible that they rely in similar neurobiological mechanisms.

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EFIC5-0833

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

LARGE-BODY-AREA COMPRESSION EXERTS ANALGESIC MODULATION ON EXPERIMENTAL PAIN

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Background and aims

Compression therapy is used for lymph edema and venous disorders. We propose that similar compression, on a large body area, generating massive afferent sensory input may exert analgesia.

Methods

Thirty healthy subjects (20-40 ages, 15 F) received painful heat 'test-stimulus' (47°C for 30", forearm) as a stand-alone and then, simultaneously with contra-lateral foot immersion in cold noxious water (8-10°C, 60"), a conditioned pain modulation (CPM) protocol. Thereafter, subjects were exposed to 3 applications of 12', 60mmHg compression applied to the lower body using Lympha Pants system ; (1) 'small' (feet), (2) 'medium' (feet and legs) and (3) 'large' (feet, legs and thighs) areas, in random order. Test-stimulus was applied at 5th (T1) and 11th min (T2) during compression, while CPM was re-assessed after each compression protocol.

Results

A significant analgesic main effect of compression on pain perception ($P=0.042$ ANOVA) was found. Post-hoc analysis revealed greater effect for large compression area ('large' vs. 'medium' protocol; $P=0.032$). rmANOVA also revealed increase in the CPM efficiency after the 'medium' compression compared to the 'small' compression ($P=0.017$).

CPM response positively correlated with compression-induced analgesia ($r=0.42$, $P<0.001$ at T1 and $r=0.24$, $P=0.014$ at T2 for the 'large' protocol).

Conclusions

Large body area compression exerts analgesic effect on experimental pain stimuli. The observed correlation with pain inhibition in response to robust non-noxious sensory stimulation may suggest that compression therapy share similar mechanisms with inhibitory pain modulation assessed via CPM.

EFIC5-0878

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

NOCICEPTIVE BEHAVIOURAL RESPONSES TO THERMAL AND MECHANICAL STIMULATION IN ROTENONE MODEL OF PARKINSON'S DISEASE.

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Background and aim:

Pain is a frequent non-motor symptom in patients with Parkinson's disease (PD), however the mechanisms underlying pain in PD are not well understood. The purpose of this study was to assess the mechanical and thermal sensitivity in an animal model of PD.

Methods:

The study was carried out on male Wistar rats. Animals were treated with either vehicle (control) or rotenone (2.75mg/kg i.p.; 5 days/week) for 6 weeks. Mechanical hypersensitivity using von Frey test and thermal hyperalgesia using Hargraeves test were investigated during 6 weeks.

Results:

All rotenone-treated animals developed bradykinesia, postural instability and rigidity, which were reversed by apomorphine, consistent with a lesion of the nigrostriatal dopamine system.

Rotenone treated rats displayed increased nociceptive responses to mechanical and thermal stimulation of the hind paw compared to control rats. The dopamine agonist apomorphine increased pain threshold and decreased nociceptive behaviour in animal model of PD.

Conclusions:

The present study explored the mechanical and thermal hypersensitivity in rotenone model of PD. These results provide additional evidence for the involvement of the nigrostriatal system in the processing of noxious somatosensory information.

EFIC5-0960

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

THE EFFECT OF EARLY LIFE INFLAMMATORY PAIN ON THE MATURATION OF ENDOGENOUS OPIOIDERGIC PAIN CONTROL SYSTEMS

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Background and Aims

Responses to pain in early life are significantly different to those in adults. Activity-dependent maturation in nociceptive pathways occurs over the first 40-50 postnatal days in rodents with the maturation of spinal networks preceding those in supraspinal sites. We have reported significant maturation of endogenous opioid signalling during postnatal development¹ and that early life pain alters maturation of the supraspinal control of spinal pain processing². Here we describe functional and anatomical alterations in the maturation of endogenous opioid systems following inflammatory pain at birth.

Methods

Sprague Dawley rats were injected s.c. with complete Freund's adjuvant (10µl) or saline on postnatal day (P)1 in one hindpaw. Bi-lateral behavioural mechanical withdrawal thresholds were assessed as animals matured. At P60 rats were injected in the same hindpaw with 5µl carrageenan or saline and acute alterations in mechanical withdrawal thresholds and weight bearing were assessed. Rats were euthanized and transcardially perfused with paraformaldehyde. Brains, spinal cords, dorsal root ganglia and skin were harvested and immunohistochemistry performed to assess the expression of opioidergic, glial and neuronal peptides.

Results

Early life pain significantly altered the expression of all components of the opioidergic system when compared to non-inflamed controls. Re-inflammation was associated with altered behavioural responses in rats compared to those that received saline.

Conclusion

Maturation of opioidergic pain control systems are significantly affected by early life inflammation and pain which alter later life pain responses.

References

- 1) Kwok, Devonshire, Bennett, Hathway. Pain (2014) 155(1):168-78
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AN INTRA-LOCUS COERULEUS HIGH AMOUNT OF BUPROPION CAN ABOLISH PHASE I AND II OF FORMALIN-INDUCED PAIN IN RAT.

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Background and aims: Formalin-induced pain can modulate by Locus Coeruleus (LC) nucleus. Our previous study showed that bupropion as an atypical antidepressant can decrease formalin-induced pain behavior in moderate concentration intra-LC and dose dependently. This study was evaluated the acute effect of intra-LC microinjection of high amount of bupropion on formalin-induced pain.

Methods: Wistar male rats were divided into 4 bupropion microinfused (0.01, 0.1, 1, and 10 microgram), control, and sham groups. The injection guide cannulae were implanted into juxta-LC bilaterally under sterile condition. The sham group received drug vehicle but control group had no intra-LC injection. Fresh formalin (50 µl, 2.5%) was injected subcutaneously in dorsoplantar region of right hindpaw in all animals (in animals with bupropion microinfusion, 30 minute after drug administration). Nociceptive signs were registered each minute and presented in 5 min bin size. Common pain score was used for pain assessment.

Results: The analysis of data with repeated-measured one-way ANOVA showed that bupropion not only reduced pain score in two phases of pain behavior dose dependently, but also the phase I and II pattern of formalin-induced pain were abolished effectively in dose 10 microgram. The pain killing effect of bupropion was dose dependent in lower amounts but the phase II is decreased greatly.

Conclusion: The phase I of formalin-induced pain is related to peripheral nociceptive afferents clearly. The inhibition formalin-induced phase I of pain revealed that LC nucleus has descending inhibitory effect on primary afferent neurons that mediated by catecholaminergic and cholinergic neurotransmission.

EFIC5-1072

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

NEURONAL ACTIVITY OF DIFFERENT SUPRASPINAL PAIN PATHWAYS DURING DNIC ACTIVATION

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Background and aims

Diffuse Noxious Inhibitory Controls (DNIC) are part of the endogenous pain modulation system. DNIC involves the modulation of trigeminal and spinal wide dynamic range neurons through descending pathways. However, if and how these DNIC are reflected directly in brain regions is unclear. Specifically, it is not known how areas involved either on the sensory or the emotional components of pain respond while DNIC happens. Here we analyze neuronal activity in the thalamus (key in the sensory pain component) and the central nucleus of the amygdala (CeA; key in the emotional pain component) during DNIC activation.

Methods

Thalamus and CeA neurons were recorded before and after application of von Frey filaments to rats left hindpaw and DNIC was induced by a pinch applied to the ear in isoflurane-anaesthetized control and neuropathic animals. Spinal nerve ligation (SNL) was used as a model of neuropathy and yohimbine, an $\alpha 2$ -adrenoceptor antagonist, was administered after baseline recordings.

Results

During DNIC activation neuronal activities of the thalamus and CeA were changed in different manners. Additionally, these changes were also different between control and neuropathy animals. Administration of yohimbine results in a general increase in neuronal firing.

Conclusions

Here we investigated neuronal activity of two key brain areas during DNIC induction in control and neuropathic rats. We suggest that the different variation in the neuronal activities of the thalamus and CeA is reflective of the pathways in which these brain areas are involved and their importance to pain modulation in both control and neuropathic rats.

PREDICTING PLACEBO PROPENSITY USING RESTING STATE FMRI*P. Tetreault¹, A. Mansour¹, T. Schnitzer², A.V. Apkarian³, M. Baliki¹*¹Physiology, Northwestern University, Chicago, USA²Rheumatology, Northwestern University, Chicago, USA³Physiology Anaesthesia and Surgery, Northwestern University, Chicago, USA

Background and aims: Because placebo response is identified to be driven by central nervous system mechanisms, it is reasonable to expect that specific brain states or traits can predispose individuals to respond or not to a placebo treatment. However no functional brain properties has been recognized so far to be able to identify and predict placebo responses especially in a clinical trial setting. **Methods:** We studied placebo related brain functional connectivity in 2 clinical trials, using resting state functional connectivity (rs-fMRI) in knee osteoarthritis (OA) patients. Study 1 was used to identify brain circuits for placebo propensity, and study 2 to validate outcomes. In study 1, 17 OA received placebo treatment for two weeks, and underwent rs-fMRI. In study 2, 19 OA received placebo and underwent rs-fMRI. Placebo response was dichotomized using > 20% decrease in pain. **Results:** In study 1, a region in the prefrontal cortex (PFC) was associated with placebo responders. Furthermore, the rostral anterior cingulate cortex, insula, caudate and periaqueductal gray were involved in a two-synapses network explaining placebo response. In study 2, functional connectivity of PFC (coordinates from study 1) predicted placebo response propensity with an area under the curve of the receiver-operating characteristic of 0.92 ($p = 0.0015$). **Conclusion:** This study suggest that propensity to placebo response to a treatment is embedded in functional properties of patients and represent a unique brain characteristic that might be used as a biomarker to perform targeted treatment approach. Supported in part by an IIT from Eli Lilly.

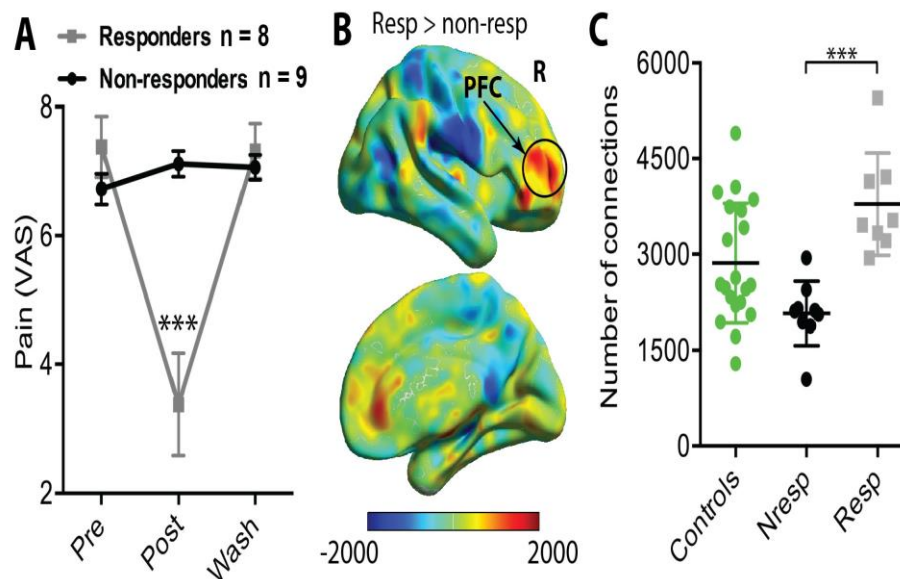


Figure: **A.** Shows the pain response of 17 OA subjects undergoing a 2-week placebo treatment, and a 2-week washout. Eight responded and 9 did not to placebo treatment. Responders returned to baseline pain after the washout. **B.** Functional connectivity contrast between responders and non-responders identifies the PFC. **C.** Number of functional connections in PFC in controls, responders (Resp) and non-responders (Nresp).

LONGITUDINAL EXPERIMENTAL HEAT PAIN PARADIGM INDUCES GRAY MATTER ALTERATIONS IN HEALTHY VOLUNTEERS IN BRAIN REGIONS ASSOCIATED WITH CHRONIC PAIN

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Recently, brain plasticity has been in the spotlight of basic and clinical research alike. Exercise-dependent changes on brain morphometry were observed in healthy volunteers [1]. In clinical populations, alterations in gray matter (GM) volume have been associated with chronic pain syndromes [2]. In a previous study, GM increase but not decrease was observed in healthy volunteers induced by a short daily paradigm applying noxious stimulation over 8 days [3]. The present study investigated changes in GM in an extended pain paradigm using voxel-based-morphometry (VBM). 67 healthy participants underwent a standardized longitudinal heat paradigm consisting of 60 suprathreshold (46°C) stimuli applied on 21 consecutive days. On days 1, 8, 14, and 21, structural MRI scans were acquired to test for GM alterations over three weeks. As previously found, we identified an increase in GM over days in the medial frontal gyrus and medial cingulate. In addition, the extended longitudinal paradigm revealed reduced GM over 21 days in pain-processing areas which have been found to be decreased in volume in pain patients, including insula and anterior cingulate. Our findings further shed light on morphometric changes in GM volume in healthy volunteers due to painful stimulation. It seems that 8 days are not sufficient to induce a significant decrease in GM, whereas the same standardized nociceptive input over 3 weeks seems to initiate these changes, which have been repeatedly observed in chronic pain patients.

References:

[1] Johansen-Berg et al. (2012) *Neuron*

[2] Smallwood et al. (2013) *J Pain*

[3] Teutsch et al. (2008) *Neuroimage*

INTERACTIONS BETWEEN PAIN AND MOTOR PROCESSING IN THE HUMAN BRAIN

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Background and aims: Pain is mostly conceptualized as a perceptual phenomenon. However, to be adaptive, pain does not only include a perceptual component but essentially depends on motor responses to avoid injury and promote recovery. The brain mechanisms of this motor component of pain are largely unknown yet. Here, we investigated how motor preparation functionally interacts with pain processing in the human brain.

Methods: 20 healthy human subjects participated in an experiment, where thermal stimuli of increasing intensity were applied to the hand. Subjects were able to stop the painful stimulation by an adaptive motor response, i.e. by pressing a button. Button presses without pain, and pain without button presses served as control conditions. During the experiment, brain activity was recorded by using EEG.

Results: The adaptive motor response was associated with a reduced amplitude of the preparatory readiness potential as compared to a similar, but non-protective button press. Likewise, the adaptive motor response was associated with a weaker preparatory suppression of beta oscillations (14-30 Hz) over frontal premotor areas than the non-protective button press.

Conclusions: Our results show that protective motor responses are associated with less preparatory brain activity than phenomenologically similar, but non-protective motor acts. This relative lack of voluntary motor preparation directly before a motor response might indicate that motor preparation occurs involuntarily and continuously during pain. These results support the hypothesis that motor preparation represents an inherent part of pain processing in the human brain.

EFIC5-0071

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

THE PROTECTIVE EFFECT OF GABAPENTIN ON SPINAL CORD INJURY

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Background and aims: Extensive research has been focused on neuroprotection after spinal cord trauma to alleviate the effects of secondary injury. The aim of this study was to research the neuroprotective effect of gabapentin in experimental spinal cord ischemia-reperfusion damage.

Methods: Eighteen adult male New Zealand white rabbits received spinal cord ischemic injury using the aortic occlusion model. Animals were divided into 3 groups (sham, control, gabapentin treatment groups; 6 rabbits in each group). (200 mg/kg) doses of gabapentin were administered to the animals in the treatment groups after spinal cord ischemic injury.

The spinal cord malondialdehyde (MDA), Advanced oxidation protein products (AOPP) and glutathione (GSH) levels were measured by a spectrophotometric method.

Results: In ischemia group the spinal cord MDA and AOPP levels were significantly higher and GSH levels were significantly lower compared to the control group. The spinal cord MDA and AOPP levels were significantly lower and GSH levels significantly higher in gabapentin treatment groups compared to the ischemia. When gabapentin treatment groups compared with control groups, no significant difference were found between spinal cord MDA, AOPP and GSH levels.

Conclusion: Gabapentin demonstrated significant neuroprotection after early phases of ischemic injury.

EFIC5-0123

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

EFFECT OF CANNABINOIDS ON CGRP RELEASE IN THE ISOLATED RAT LUMBAR SPINAL CORD PAIN PATHWAY

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Background & Aims: The mechanisms by which cannabinoids cause analgesia are debated. It has been proposed that cannabinoids can provide analgesia in the spinal cord by modulating the release of CGRP, an inflammatory peptide, involved in neurogenic inflammation in the CNS and nociceptive signalling. The aims of our experiments were to test this hypothesis.

Methods: We tested the action of cannabinoid CB1 and CB2 receptor agonists on capsaicin-evoked CGRP release from isolated rat lumbar spinal cord and sciatic nerve preparations as measured with ELISA, and used immunohistochemistry to confirm the presence of CGRP in lumbar spinal cord afferents terminals.

Results: Immunohistochemistry confirmed strong, specific expression of CGRP in the spinal cord which was localised to areas primarily involved in nociceptive signalling. We found that the TRPV1 agonist capsaicin treatment CGRP release and that the TRPV1 antagonist capsazepine was successful in inhibiting capsaicin-evoked CGRP release. However, in contrast to previous reports none of the cannabinoid receptor agonists tested produced a significant effect on CGRP release.

Conclusions: These results conflict with the majority of studies conducting similar investigations and calls into question the role of cannabinoids in modulating spinal cord neurogenic inflammation and subsequent nociceptive sensitization.

EFIC5-0150

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

INTRATHECALLY APPLIED MINOCYCLINE PREVENTS BUT DOES NOT REVERSE NGF-INDUCED HYPEREXCITABILITY OF DORSAL HORN NEURONS

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Background and aims: Microglia has been proved to be involved in pain mechanisms, but little is known about the influence of microglia in muscle pain. The present study aimed at investigating the role of spinal microglia in nerve growth factor (NGF) - induced hyperexcitability of spinal dorsal horn neurons in a rat model of non-specific low back pain.

Methods: Recordings from dorsal horn neurons (L2) were made in anesthetized rats to study hyperexcitability induced by 2 NGF injections into the multifidus muscle at an interval of 5 days. Minocycline (200 µg/day), a specific inhibitor of microglial activation, or solvent (controls) were continuously administered intrathecally starting 1 day before (pre-minocycline) or 2 days after (post-minocycline) the 1st NGF injection.

Results: Compared to controls, rats with pre-minocycline exhibited a significant decrease in NGF-induced hyperexcitability. The proportion of neurons responsive to mechanical stimulation of deep tissues (muscle and/or fascia) was reduced from 50% to 17.65% ($P < 0.01$). The proportion of neurons with convergent input (responding to stimulation of at least 2 types of different tissues) decreased from 35.29% to 5.88% ($P < 0.01$). However, no significant decrease in neuronal hyperexcitability was found in post-minocycline rats.

Conclusions: The block of microglial activation prevented but did not reverse the neuronal hyperexcitability induced by NGF injections into the multifidus muscle. The induction of neuronal hyperexcitability depends on microglia, but not its maintenance.

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THE NOCICEPTIVE INHIBITORY REFLEX IN VASOCONSTRICTOR NEURONS

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Background and aims:

Cutaneous (CVC) and muscle vasoconstrictor (MVC) neurons exhibit typical reflex patterns to physiological stimulation of somatic and visceral afferent neurons. Here we tested the hypothesis that CVC neurons are inhibited by stimulation of cutaneous nociceptors but not of muscle nociceptors and that MVC neurons are inhibited by stimulation of muscle nociceptors but not of cutaneous nociceptors.

Methods:

The activity in the vasoconstrictor neurons was recorded from postganglionic axons isolated from the sural nerve or the lateral gastrocnemius-soleus nerve in anesthetized rats. The nociceptive afferents were excited by mechanical stimulation of the toes of the ipsilateral hindpaw (skin), by hypertonic saline injected into the ipsi- or contralateral gastrocnemius-soleus muscle or by heat or noxious cold stimuli applied to the axons in the common peroneal nerve or tibial nerve.

Results:

CVC neurons are inhibited by noxious stimulation of skin but not by noxious stimulation of skeletal muscle. MVC neurons are inhibited by noxious stimulation of skeletal muscle but not by noxious stimulation of skin. These inhibitory reflexes are most likely organized in the spinal cord. Stimulation of nociceptive cold sensitive afferents does not elicit inhibitory or excitatory reflexes in cutaneous or muscle vasoconstrictor neurons.

Conclusions:

The reflex inhibition of activity in the vasoconstrictor neurons generated by stimulation of nociceptive cutaneous or muscle afferents during tissue injury leads to local increase of blood flow resulting in an increase of transport of immunocompetent cells, proteins and oxygen to the site of injury and enhancing the processes of healing.

EFIC5-0256

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

PERK1/2 IMMUNOFLUORESCENCE IN RAT DORSAL HORN AND PARAVENTRICULAR NUCLEUS NEURONS AS A MARKER FOR SENSITIZATION AND INHIBITION IN THE PAIN PATHWAY

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Background and Aims: The aim of the present study was to visualize activation and pharmacological inhibition in the pain pathway of the rat at the level of the lumbar dorsal horn and the parvocellularis part of the paraventricular nucleus.

Methods: In rats anesthetized with sodium pentobarbital an intermittent noxious heat stimulus (5 min) or a sequence of mustard oil (5 min) and noxious heat stimulus was applied to both hind paws. The phosphorylation of the signalling molecule ERK1/2 was investigated by fluorescence-immunohistochemistry following the noxious thermal hind paw stimulation. Pretreatment with morphine or the NMDA antagonist MK-801 was used as a pharmacological tool to modify pain transmission.

Results: Two and 10 min after the thermal stimulation a 4-fold increase in pERK1/2 immunoreactivity was observed in cells of lamina I/II of the L3-L5 dorsal horn. The combination of mustard oil with heat led to a 5-6-fold increase in the pERK1/2 signal. The pERK1/2 immunoreactivity in the parvocellularis part of the paraventricular nucleus increased by 2-fold following the heat stimulus, with no further increase following the sequential mustard oil and heat stimulus. A pretreatment with the opioid analgesic morphine or the NMDA antagonist MK-801 markedly attenuated ERK1/2 phosphorylation in both areas of the pain pathway.

Conclusions: The present findings support the concept that the pERK1/2 immunofluorescence signal can be used as a quantitative marker for sensitization or inhibition in the pain pathway at spinal and hypothalamic level.

EFIC5-0458

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

SUPERFICIAL VERSUS DEEP LAMINAE OF THE DORSAL HORN ARE DIFFERENTIALLY INNERVATED BY BULBAR SEROTONERGIC PROJECTIONS IN THE RAT

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Convergent data showed that bulbo-spinal serotonergic (5-HT) projections exert complex modulatory influences on nociceptive signaling within the dorsal horn. These neurons are located in the B3 area which comprises the median raphe magnus (RMg) and the lateral paragigantocellular reticular (LPGi) nuclei. We recently noted that LPGi 5-HT neurons differ from RMg 5-HT neurons regarding both their respective electrophysiological properties and responses to noxious stimuli (Pain 154:647-59, 2013). We herein used anatomical approaches for further characterization of the respective projections of LPGi versus RMg 5-HT neuron subgroups.

Adult Sprague-Dawley rats were stereotactically injected into the RMg or the LPGi with the anterograde tracer Phaseolus vulgaris leucoagglutinin (PHA-L). The precise location of injection site and RMG vs LPGi spinal projections into the different dorsal laminae were visualized by PHA-L immunolabeling. Double immunofluorescent labeling of PHA-L and serotonin transporter (5-HTT) allowed detection of serotonergic fibers among bulbo-spinal projections.

Anterograde tracing showed that RMg neurons project preferentially into the deep laminae V/VI whereas LPGi neurons projections are confined to the superficial laminae I/II. Double immunolabeling clearly showed that a portion of PHA-L positive fibers had a serotonergic phenotype in both superficial and deep laminae all along the spinal cord.

These results support the idea that distinct B3 5-HT projections could modulate pain signaling by superficial versus deep laminae neurons in the rat spinal cord. Experiments are under way to investigate whether such differential projections might underlay specific modulatory influences of LPGi vs RMg 5-HT neurons on hyperalgesia vs allodynia in neuropathic rats.

EFIC5-0607

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

ROLE OF THE SPINAL CORD IN HYPERALGESIC PRIMING IN THE RAT

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Background and Aims

Hyperalgesic priming models the transition from acute to chronic pain. Our aim was to replicate a model of hyperalgesic priming and investigate possible spinal mechanisms.

Methods

Male Sprague-Dawley rats received an intraplantar injection of 1% carrageenan or saline (5µl), and paw withdrawal thresholds (PWTs) were assessed. PGE₂ (1µg, 5µl) was then injected into the same site and behaviour was assessed for 7 days. Rats were perfused and spinal cord slices were stained for Iba-1 (microglia). In a separate group of rats, mechanically-evoked responses of wide dynamic range neurones (WDR) in the dorsal horn were recorded pre and post injection of PGE₂ 7 days following carrageenan/saline injection.

Results

Carrageenan evoked mechanical hyperalgesia (lowered PWT) which resolved at 3-5 days. PGE₂ injection lowered PWTs in both carrageenan and saline pre-treated rats. PGE₂ mediated responses were short-lived (1h) in saline-treated rats. In carrageenan-treated rats, PGE₂ mediated responses lasted 7 days. Numbers of activated Iba-1 positive microglia in the ipsilateral dorsal horn 7 days post PGE₂ injection were comparable in saline and carrageenan pre-treated rats. 7 days post carrageenan injection; intraplantar injection of PGE₂ increased mechanically-evoked firing of WDR neurones to a comparable extent in rats pre-treated with saline or carrageenan.

Conclusions

The hyperalgesic priming of behavioural responses to mechanical stimuli was not associated with alterations in evoked responses of spinal neurones, nor long-term changes in activation state of spinal microglia.

EFIC5-0673

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

CAN NAV1.7 BE TARGETED FOR CONTROLLING PAIN AFTER BURN INJURY?

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Background and aims: controlling pain in burn injury patients is still a major clinical challenge and an unmet medical need. **Na_v1.7 has been suggested as a potential therapeutic target for pain management in various conditions.** Our aim was **to find out whether Na_v1.7 is feasible target for control pain in burn injury.**

Methods: experiments were performed in accordance with the requirements of the Animals (Scientific Procedures) Act 1986 (UK) Amendment Regulations 2012 (SI 2012/3039) and adhered to the guidelines of the Committee for Research and Ethical Issues of IASP published in Pain, 16 (1983) 109- 110. One of the hind paws of urethane-anaesthetised Sprague-Dawley adult male rats was immersed into 60°C water for 2 minutes to induce a partial thickness second degree scalding type burn injury. Voltage clamp recordings and immunostaining with an anti-Na_v1.7 in primary sensory neurons were used to assess changes in the activity and expression of Na_v1.7. pERK1/2 expression was assessed to find out the effect of blocking Na_v1.7 on spinal nociceptive processing.

Results: burn injury increased Na_v1.7 expression and activity in primary sensory neurons. The number of pERK1/2 positive neurons peaked at 5 minutes post-injury stabilised at a reduced level at later time points (up to 3 hours). Blocking Na_v1.7 significantly reduces spinal pERK1/2 expression.

Conclusion: Na_v1.7 appears to be a feasible target to reduce pain in burn injury.

ALTERED EXPRESSION OF ADIPOKINES IN SPINAL CORD WITH DIABETES: A ROLE IN PAIN MODULATION?

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Adipose tissue derived adipokines play a major role in a variety of disease conditions, and expression is altered with obesity and in type 2 diabetic patients; both conditions associated with development of co-morbid pain. The aim of this study was to characterise adipokine expression in plasma and spinal cord in a rat model of type 2 diabetes (T2D) and to determine if changes in expression parallel altered sensory processing.

Responses to thermal and mechanical stimulation of the hindpaw were assessed in adult male Wistar rats fed a high fat diet for 16 weeks and injected intraperitoneally with low dose of streptozotocin (30mg/kg; model of T2D), and control rats fed a normal diet and injected with vehicle. A Proteome Profiler Antibody Array was used to measure adipokine expression in plasma and real-time PCR measured mRNAs in spinal cord.

T2D rats but not control rats displayed significant thermal and mechanical hyperalgesia ($P < 0.001$ vs. controls). The Array data showed clear alterations ($>50\%$ change in expression in T2D vs. control rats) in 8 out of 31 adipokines (including RAGE, adiponectin, leptin, LIF, IL-10; IL-1 β , IL-6, TNF- α), while in spinal cord altered expression of adiponectin, lipocalin-2, RAGE, IL-1 β , TNF- α and leptin mRNAs was observed in diabetic rats.

The increased pain sensitivity and altered adipokine expression profile in T2D rats fits well with the hypothesis that changes in key adipokines, both in circulation and centrally may underlie pain with diabetes, although further studies are necessary to confirm a causative role.

PEALUT: A NEW APPROACH IN NEUROREGENERATION AFTER SPINAL CORD INJURY

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Background: Spinal cord injury (SCI) is well-known to induce the activation of astrocytes and the infiltration of immune cells at the lesion site, but whether SCI also induces the production of new neurons *in vivo* remains controversial. Moreover, several studies showed that spinal neurogenesis occurs to a limited extent after SCI, but that it could be stimulated by experimental intervention. In that regard, recently, we demonstrated that treatment with a new formulation including palmitoylethanolamide (PEA) and the antioxidant compound luteolin (Lut), namely co-ultraPEALut, significantly reduced inflammation associated with SCI.

Aims: The aim of this study was to investigate the possible neuroregenerative effect of co-ultraPEALut in the injury-induced neurogenesis in an experimental model of SCI.

Methods: SCI was induced in mice by the application of vascular clips to the dura via a four-level T5 to T8 laminectomy. Mice were administered co-ultraPEALut (1 mg/kg, intraperitoneally) daily for 72h after SCI.

Results: Chronic exogenous administration of co-ultraPEALut increased bromodeoxyuridine (BrdU) and doublecortin immunoreactive cells in the spinal cord from SCI mice. This neuronal development was correlated with synaptic plasticity, identified using the Golgi impregnation method to analyze dendritic spines density in spinal cord. In addition, co-ultraPEALut treatment also increased the expression of different neurotrophic factors, such as brain-derived neurotrophic factor (BDNF), glial cell-derived neurotrophic factor (GDNF), nerve growth factor (NGF) and neurotrophin-3 (NT-3).

Conclusions: The results indicate that co-ultraPEALut have a role on survival, differentiation of new neurons and maturation of spines and could be a therapeutic treatment in traumatic diseases.

BILATERAL ANTINOCICEPTIVE EFFECT OF BOTULINUM TOXIN TYPE A IN A RAT MODEL OF „MIRROR“ PAIN INVOLVES SPINAL GABA

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Background and aims: According to recent observations botulinum toxin type A (BTX-A) alleviates different types of pain by acting within central nervous system, but the mechanism of its central action is poorly understood. Previously we reported the bilateral antinociceptive effect of BTX-A in carrageenan induced bilateral muscle pain. Here we investigated the effects of selective GABA antagonist bicuculline on BTX-A's bilateral antinociceptive action.

Methods: Male Wistar rats were injected into right gastrocnemius muscle with 100 µL of 3% carrageenan or saline. Animals which developed bilateral secondary mechanical allodynia (tested with von Frey filaments) were divided into following groups (6 animals per group): saline or BTX-A (5 U/kg) (intraplantar, into the right hind paw); saline or BTX-A + bicuculline (1 µg/ 10 µL, intrathecal); saline or BTX-A + bicuculline (1 µg/ 10 µL, into cisterna magna). BTX-A was injected 5 days and bicuculline 30 min before nociceptive testing.

Results: Unilaterally injected BTX-A decreased mechanical hypersensitivity not only on ipsilateral ($p < 0.001$), but on the contralateral side as well ($p < 0.001$). Intrathecal, low dose of bicuculline abolished the bilateral antinociceptive effect in BTX-A treated animals ($p < 0.001$), while the same dose applied into cisterna magna had no effect on BTX-A's antinociceptive action. Bicuculline alone had no effect on carrageenan induced bilateral allodynia.

Conclusions: Unilaterally injected BTX-A has bilateral antinociceptive effect in carrageenan induced bilateral pain that can be prevented with GABA antagonist bicuculline. This indicates the involvement of central GABA-ergic system in bilateral antinociceptive effect of BTX-A, most probably at spinal level.

EFIC5-0907

Basic Science (Anatomy/physiology/pharmacology/behaviour): Spinal cord

ARE FEMALE MICE MORE SUSCEPTIBLE TO CRPS-LIKE CHANGES AFTER BONE FRACTURE THAN MALES?

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The prevalence of the neurological disease Complex Regional Pain Syndrome (CRPS), which can occur after bone fracture, is higher in female patients. Mimicking CRPS in mice, a tibial fracture model has been developed but most studies are conducted in male mice. We compared male with female animals in their behavioral and electrophysiological outcome after tibial fracture and followed them over six months. Females differed in exaggeration of the posttraumatic inflammation and spinal reorganization after bone fracture. Receptive fields in the spinal cord were enlarged after the trauma in males and females however they recovered only in male mice, not females. Thus gender specific mechanisms might impact on the vulnerability to develop a CRPS in humans as well as in mice.

OFFSET ANALGESIA IS ACCOMPANIED BY REDUCED BOLD RESPONSES TO NOXIOUS STIMULATION IN THE SPINAL CORD

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Background and aims:

Offset analgesia is a marked pain reduction subsequent to short-term stimulus increase that is significantly stronger than due to stimulus adaptation (Grill and Coghill, 2002). Previous studies indicated a potential involvement of the descending pain modulatory system during this phenomenon (Derbyshire & Osborn, 2009). Given that the ultimate target of this system is the dorsal horn of the spinal cord, we investigated neuronal responses during an offset-analgesia paradigm at the spinal level.

Methods:

22 healthy volunteers (mean age $25.6y \pm 0.7sem$) underwent painful thermal stimulation (Peltier-Thermode) to the left radial forearm (dermatome C6). Trials consisted either of constant thermal stimulation at P60 for 45s ("constant trials"), an temperature profile with a 10s stimulus increase of $1.5^{\circ}C$ after 15s and a subsequent return to the initial temperature ("offset trials"), or an identical stimulation profile but a return to the baseline temperature during the last phase ("baseline trials"). Neuronal activity in the spinal cord was assessed with high-resolution BOLD fMRI.

Results:

We observed significant BOLD responses corresponding to the "main effect of pain" in the ipsilateral dorsal horn of the spinal segment C6 ($t(20)=3.63$, $p<0.05$). BOLD responses were significantly lower during the last phase of the offset trials compared to the last phase of the constant trial ($p<0.05$) at the same site, while no difference to the baseline trials was observed.

Conclusions:

Given offset analgesia is most likely centrally mediated, the results point towards a top-down modulation of spinal activity underlying offset analgesia.

NOCICEPTIN RECEPTOR EXPRESSION IN CLINICAL SENSORY DISORDERS AND ITS FUNCTIONAL EFFECTS IN CULTURED HUMAN DORSAL ROOT GANGLION NEURONS

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Background and aims. The nociceptin/orphanin FQ peptide (NOP) receptor exerts several effects including modulation of pain signalling. We have studied NOP receptor distribution and levels in tissues from clinical visceral and somatic sensory disorders, and its functional effects in sensory neurons.

Methods. Specimens were immunostained with a rabbit polyclonal antibody (sc-15309) for NOP receptors, and effects of nociceptin assessed in cultured dorsal root ganglion (DRG) neurons.

Results. In control post-mortem human DRGs, 82% and 75% small-diameter neurons were NOP receptor-positive in lumbar and sacral DRG respectively; expression in avulsion-injured cervical human DRGs was similar. NOP receptor-positive nerve fibres within the urothelium/sub-urothelium showed a significant increase in both Detrusor Overactivity (p

Conclusions. Increased receptor expression highlights the potential of NOP receptor agonists particularly in bladder syndromes, in accord with reports of effective nociceptin instillation in patients with Neurogenic Detrusor Overactivity. The regulation of NOP receptor expression in sensory neurons deserves further study, as does the effect of NOP receptor agonists in clinical bladder disorders.

EFIC5-0277

Basic Science (Anatomy/physiology/pharmacology/behaviour): Receptors

CARRAGEENAN-INDUCED KNEE JOINT INFLAMMATION INCREASES P2X3 RECEPTORS EXPRESSION IN THE CHONDROCYTES OF ARTICULAR CARTILAGE OF RATS

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Background and aim: We have recently demonstrated that endogenous ATP via P2X3 receptors activation is essential to carrageenan-induced articular pain and inflammation development in rats knee joint. Since the P2X3 receptor is expressed in chondrocytes, the aim of this study was to investigate whether the carrageenan injection in the rats' knee joint could alter the P2X3 receptor expression in the chondrocytes of the articular cartilage.

Methods: All experimental procedures were approved by the Ethics Committee in Animal Research at the UNICAMP (2049-1) and UIOWA. Male wistar rats under anesthesia received an intra-articular injection of carrageenan or vehicle. Three hours later, rats were euthanized and the whole knee joints were removed, decalcified, embedded in OCT compound and cryosectioned at 20µm using a cryostat. The P2X3 receptor expression was quantified by immunofluorescence method.

Results: The intra-articular administration of carrageenan (300 µg/knee) increased the P2X3 receptor expression on the chondrocytes of the articular cartilage covering the femoral condyle, tibial plateau and meniscus when compared with the 0.9% NaCl and naive groups (P<0.05, Tukey test). The 0.9% NaCl injection alone did not affect the P2X3 receptor expression in the chondrocytes of the three regions analyzed when compared with the naive group (P>0.05, Tukey test).

Conclusion: Knee joint inflammation significantly increases the P2X3 receptor expression in the chondrocytes of the articular cartilage and this increased expression may contribute to carrageenan-induced articular hyperalgesia.

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EFIC5-0593

Basic Science (Anatomy/physiology/pharmacology/behaviour): Receptors

INVESTIGATIONS OF SIGNALING OF OXYMORPHONE ANALOGUES, AS POTENT AGONISTS INTERACTING WITH THE MU OPIOID RECEPTOR

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Background and aims: The mu opioid receptor (MOR), the primary molecular target of clinically used opioids, is involved in pain modulation, but also mediates unwanted effects. Physiological effects of MOR activation result from different signaling pathways: analgesia is G protein-mediated, and adverse effects are linked to the β -arrestin2 recruitment. Functionally selective ligands which do not engage β -arrestin2 interactions, but activate G protein signaling preferentially may serve as effective analgesics with improved side-effect profiles. We describe signaling of three analogues of the opioid analgesic oxymorphone, namely 14-O-methyloxymorphone (14-OMO), 14-methoxymetopon (14-MM) and 5-benzyl-14-O-methyloxymorphone (BOMO) in different signaling assays.

Methods: Cell lines expressing human MORs were utilized to evaluate G protein coupling, β -arrestin2 recruitment and MOR internalization in specific assays. Antinociceptive activities were determined in mice using chemical and thermal nociceptive tests.

Results: All three molecules display high affinity and selectivity for the MOR, and high potency and efficacy in promoting MOR-mediated G protein signaling. They were potent in inducing β -arrestin2 recruitment, with 14-OMO and 14-MM showing full efficacy (>80%), while BOMO had lower efficacy (17%), compared to the prototypical agonist DAMGO. BOMO was less effective in stimulating MOR internalization, a profile different from the other two agonists. They induce potent antinociception in mice.

Conclusions: Ongoing analysis of the MOR activity profile for the three oxymorphone analogues will probe whether they display bias toward one pathway over another. These data provide valuable insights into the different signaling pathways activated by the oxymorphone analogues, with BOMO as the most interesting agonist for further investigations.

EFIC5-0741

Basic Science (Anatomy/physiology/pharmacology/behaviour): Receptors

EFFECT OF INTRATHECAL ADMINISTRATION OF A TLR4 BLOCKER IN AN ANIMAL MODEL OF OSTEOARTHRITIS

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Background and aim: Contribution of Toll-Like Receptor 4 (TLR4) to pain sensitization has been demonstrated to occur under chronic pain conditions. We previously described an antinociceptive effect of TLR4-A1, a TLR4 inhibitor in peripheral neuropathic pain. Here, we investigated the effect on pain behaviour of this TLR4 blocker, centrally administered, in an animal model of osteoarthritis (OA).

Methods: Wistar rats weighing 250-300g were used. OA was induced by a single intraarticular injection of 2mg of monosodium iodoacetate (MIA) on the right knee joint of anaesthetized rats. Intrathecal surgery was performed as previously described (Avila-Martin et al., 2011). TLR4-A1, 10mgkg⁻¹, was intrathecally administered during the first five days post-MIA injection. SHAM-animal and Saline-treatment were used as control. Heat-hyperalgesia and tactile-allodynia were tested on day 0, 7, 14 and 21, immediately before drugs administration. TLR4-A1 was synthesized by Dr Quesada from a compound described by Peri (2009).

Results. In SHAM animals, no differences in mechanical and thermal thresholds were found for 3 weeks of experiments. MIA produced a statistically-significant mechanical-allodynia (decrease of threshold on 57.3% and 53.3% vs 100% control) and heat-hyperalgesia (decrease of threshold on 75.1% and 83.8% vs 100% control) on day 14 and 21 respectively. Saline-treatment did not modify mechanical nor thermal thresholds. TLR4-A1-treatment reduced tactile-allodynia and values returned to control on day 14 (92.9%) and 21 (94.7%). TLR4-A did not modify heat-hyperalgesia on day 14 (67%) nor 21 (82% vs 100% control)

Conclusion. Intrathecal blocked of TLR4 receptors induces a decrease of tactile-allodynia in MIA induced osteoarthritis.

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P2X7 RECEPTORS EXPRESSED ON NON-NEURONAL CELLS OF RAT SENSORY GANGLIA CONTRIBUTE TO ESTABLISHMENT OF PERIPHERAL INFLAMMATORY PAIN

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Background and aim: Studies indicate that ATP-induced P2X7R activation is essential to maturation and release of IL-1 β on peripheral tissues. This is one of the main proinflammatory cytokines which has been associated in pain conditions by upregulating pro-nociceptive mediators. On the other hand, the role of P2X7R expressed on non-neuronal cells (satellite glial cells, SGCs) of sensory ganglia (dorsal root ganglia, DRG) is unknown. Therefore, our aim was to evaluate the contribution of P2X7 receptors expressed on SGCs during the development of peripheral inflammatory pain.

Methods: Complete Freund's adjuvant (CFA) was administered in rat hindpaw (intraplantar; 100 μ L 50% CFA solution) and mechanical hyperalgesia was measured by electronic von Frey test. P2X7R selective antagonist A-740003 (0.01mM, 0.1mM or 1.0mM/5 μ L) was administered directly into L5-DRG immediately before CFA and tests were performed hourly for 6h after CFA administration. Oligodeoxynucleotide antisense (ODN-AS) against the P2X7R (30 μ g/5 μ l) was also administered into L5-DRG during four days prior to CFA stimuli and the test was performed 6h after CFA administration (mechanical hyperalgesia peak).

Results: Both treatments A-740003 (all doses, Fig.1) and ODN-AS (Fig.2) demonstrated significant antihyperalgesic effect as compared with control-treated animals. Also A-740003 (0.1mM or 1.0mM doses) presented prolonged antihyperalgesic effect along the 6h after CFA administration (F=5.59, P<0.005). These data demonstrate that selective blockade or the lack of P2X7R expression in DRG attenuated the establishment of mechanical hyperalgesia.

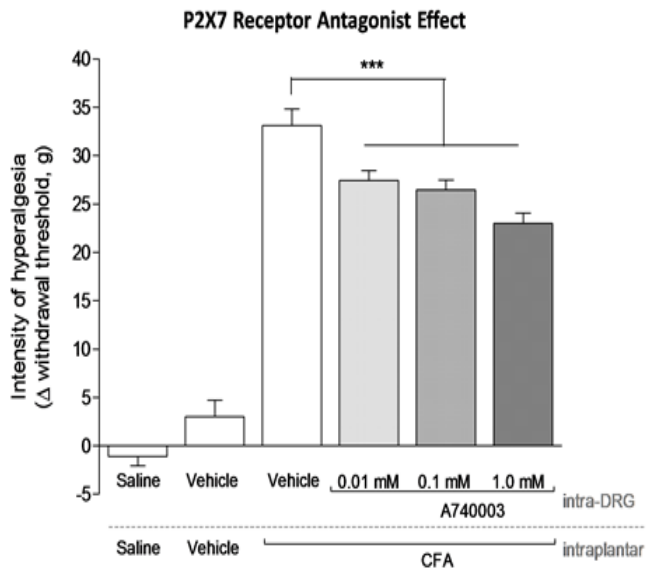


Fig.1 - Antihyperalgesic effect of A-740003 (intra-DRG; 5μL; 0.01, 0.1 e 1.0mM) on mechanical hyperalgesia peak induced by CFA (6th hour) as compared with saline or vehicle-treated animals. Data are expressed as mean ± SEM (n = 7 / group). ***ANOVA and Bonferroni post test (F = 17.76, P < 0.0001).

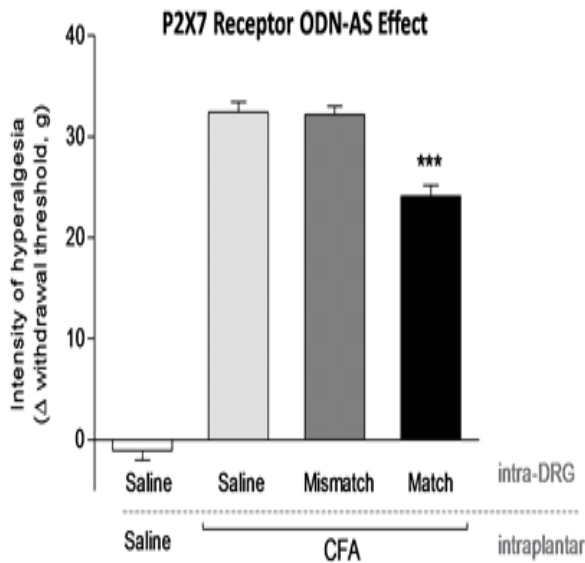


Fig.2 - Antihyperalgesic effect of ODN-AS against the P2X7R (intra-DRG; 30μg / 5μL / 4 days) on mechanical hyperalgesia peak induced by CFA (6th hour) as compared with saline or mismatch-treated animals. Data are expressed as mean ± SEM (n = 6-7 / group). ***ANOVA and Bonferroni post test (F = 188.8, P < 0.0001).

Conclusion: We provided evidence that SGCs (via P2X7R) contribute to establishment of mechanical hyperalgesia due to a peripheral inflammatory pain.

Acknowledgement: FAPESP Grant #2013/08678-6.

PRIMARY DISRUPTION OF MOTOR COORDINATION AFFECTS ASSESSMENT OF ANALGESIC EFFECT INDUCED BY PHARMACOLOGICAL MODULATION OF D2/D3 DOPAMINE RECEPTORS

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Background and Aims

Several studies have shown that pharmacological modulation of dopamine receptors has a direct analgesic effect in animal models of pain and that lesioning of the midbrain dopaminergic neurons affects pain-related behavior. However, the majority of tests for analgesia assessment in animal models rely on motor responses and surprisingly almost no studies have controlled for motor impairment during evaluation of dopamine-related analgesia. In this study we checked if changes in general locomotor activity may confuse the analysis of analgesia efficacy.

Methods

Experiments were performed in Sprague-Dawley adult male rats subjected to the Spared Nerve Injury (SNI) model of neuropathic pain or to a sham intervention (n=10 per experimental group). Animals received vehicle (saline solution, 0.9% w/v NaCl), D2/D3 receptors agonist quinpirole hydrochloride (0.01, 0.05, 0.1, 0.5, and 1 mg/kg i.p.) or D2/D3 receptors antagonist raclopride tartrate (0.01, 0.05, 0.1, 0.5, and 1 mg/kg i.p.). Locomotor activity performance was evaluated using a video-tracking analysis of open-field exploration. Somatosensory responses were evaluated using Von Frey filaments, paw flick test, tail flick test, and Randall-Selitto paw pressure test.

Results

We describe that modulation of D2 receptors cause profound changes in the locomotion and exploratory activity of animals; drug dosages that have been previously described to have analgesia efficacy induce strong dyskinesia and catalepsy.

Conclusions

We conclude that modulation of D2/D3 receptors have important sensorimotor consequences that mask any clear analgesic effect. Future studies should consider motor impairment when using nociceptive testing in animal models.

BLOCKAGE OF SPINAL NEURONS AND MICROGLIA PLAYS AN IMPORTANT ROLE IN THE ANTI-NOCICEPTIVE EFFECT OF BD1047 IN ZYMOSAN INDUCED HYPERALGESIA IN RATS

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Background and aim: It has been reported that the sigma-1 receptor (Sig-1R) is a promising analgesic target in several pain models. However, the precise mechanisms underlying the antinociceptive effect of Sig-1R antagonist in inflammatory pain conditions were not fully understood. Methods: In this reason, present study was aimed to elucidate the role of spinal neuron and microglia in the anti-nociceptive mechanism of BD1047 (a selective Sig-1R antagonist) using intraplantar injection of zymosan induced inflammatory pain model. Results: Oral pretreatment of BD1047 significantly reduced zymosan induced thermal and mechanical hyperalgesia as well as spinal neuronal activation including Fos, protein kinase C (PKC) and PKC-dependent phosphorylation of the NMDA receptor subunit NR1. Zymosan induced inflammation also led to increase CD11b immunoreactivity (a marker of microglia) accompanying with phosphorylated p38 mitogen activated protein kinase (p-p38) and interleukin-1 β (IL-1 β) immunoreactivity in spinal dorsal horn, which was completely reversed by oral pretreatment of BD1047. Immunohistological finding and spinal neuronal single cell RT-PCR revealed that the Sig-1R was predominantly located in both central ending of unmyelinated primary afferent fiber and spinal dorsal horn neurons. Consistently, intrathecal pretreatment of BD1047 reproduced a similar antinociceptive effect as compared with that of its oral administration. Pharmacological study further revealed that intrathecal injection of microglia modulator (minocycline), p-p38 inhibitor (SB203580) or IL-1 β neutralizing antibody dramatically reduced zymosan-induced hyperalgesia. Conclusions: These data suggested that antinociceptive effect of BD1047 may be mediated, at least in part, by the spinal inhibition of neuron and microglia activation in the inflammatory conditions.

DIFFERENTIAL ROLE OF DESCENDING SEROTONERGIC MODULATION INVOLVING SPINAL 5-HT_{1A} RECEPTOR IN EARLY AND LATE MECHANICAL ALLODYNIA OF CARRAGEENAN-INDUCED PERIPHERAL INFLAMMATION

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Backgrounds and aim: Direction of spinal serotonergic modulation could be dependent on the type of pain and activated 5-HT receptor (5-HT_R) subtypes. It was reported that descending serotonergic inhibition is dominant over facilitation, and spinal 5-HT release is peaked 2-3 hours but returns to baseline 8 hours during early-phase of carrageenan-induced inflammatory pain. In addition, electrophysiologic studies found a lack of significant involvement of 5-HT_{3R}, a well-known facilitatory 5-HT_R subtype. Instead, spinal 5-HT_{1A} and 5-HT_{1BR} were shown to exert a facilitatory effect on neuronal responses of carrageenan-injected rat. We examined the role of 5-HT_{1R} and 5-HT_{3R} using behavioral tests and evaluated the overall role of descending serotonergic projections in carrageenan model.

Methods: Effects of intrathecal (i.t.) 5-HT hydrochloride and agonists of 5-HT_{1AR} (8-OH-DPAT), 5-HT_{1BR} (CP-93,129) or 5-HT_{3R} (mCPBG) on mechanical allodynia were examined in male Sprague-Dawley rats. Drugs were injected either 1 hour (early-phase allodynia) or 24 hours (late-phase allodynia) after intraplantar injection of carrageenan.

Results: I.t. treatment with 5-HT did not affect the early-phase mechanical allodynia, but significantly attenuated the late-phase allodynia in a dose-dependent fashion when administered 24 hours after carrageenan injection ($p < 0.05$). Similarly, i.t. 8-OH-DPAT produced an anti-allodynic effect for late-phase allodynia, but not for early-phase. Neither i.t. CP-93,129 nor mCPBG showed any anti-allodynic effect.

Conclusion(s): Spinal serotonergic projections are involved in inhibitory descending modulation on nociceptive processing of both early- and late-phase allodynia with greater anti-allodynic effect for late-phase of carrageenan-inflammation, possibly mediated by 5-HT_{1AR}, but not by 5-HT_{1BR} or 5-HT_{3R}.

EFIC5-0022

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

DIFFERENCES IN ADAPTIVE BEHAVIOR IN ADOLESCENT RATS EXPOSED TO PAIN OR STRESS DURING NEWBORN PERIOD

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Background and aims Early noxious events can alter development of the nociceptive and stress systems and have long-term consequences. In this study we addressed the tonic pain-related response, anxiety- and depression-related behaviors, and spatial learning in adolescent male and female rats exposed as newborns to repeated inflammatory pain or stress. There are a few studies in females in this area which demonstrate inconsistent results.

Methods The tonic nociceptive system in the formalin test, anxiety- and depression-related behaviors in the elevated plus maze and in the forced swim test, respectively, and spatial learning in the Morris labyrinth were investigated in adolescent male and female rats exposed during the first and the second days of life to adverse influences (formalin-induced pain, maternal deprivation, combination of these two influences).

Results Rats which as newborns experienced stress of short-term maternal deprivation, displayed increased licking behavior in the formalin test. Combined effect of inflammatory pain and maternal deprivation in newborns failed to change pain sensitivity. Only males with early inflammatory pain, but not females, displayed hyperalgesia in the formalin test in the adolescent period. Adverse events manifested themselves also in other kinds of adaptive behavior. Males with neonatal pain and males with pain and stress displayed spatial learning disability.

Conclusions Separation in influences of early stress or pain was revealed in adolescent females in the formalin test: early maternal deprivation induced hyperalgesia, whereas early pain failed to change functional activity of the tonic nociceptive system.

Acknowledgement: This work was supported by the RFBR (N 14-04-01381).

EFIC5-0023

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

NEONATAL INFLAMMATORY PAIN CHANGES ADAPTIVE BEHAVIORS IN LATER LIFE IN RATS

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Background and aims Neonatal repeated pain can influence pain sensitivity and behavior in later life, but mechanisms are poorly studied. Results obtained in various experimental conditions favor understanding mechanisms of this phenomenon. The aim of the study was to evaluate pain sensitivity, the level of anxiety- and depression-like behaviors and spatial learning in adolescent rats which as neonates were exposed to repeated inflammatory pain.

Methods Male and female rats at the age of 7 and 8 days were exposed to injection of formalin at the pad of the left hind paw and then to maternal deprivation for 60 min (I); the controls: formalin injection without maternal deprivation (II), saline injection+maternal deprivation (III), saline injection without maternal deprivation (IV). At the age of 25 days these rats were examined in the hot plate test, formalin test, elevated plus maze, forced swim test and Morris labyrinth.

Results Adolescent male and female rats (II) showed a decrease in the latent period in the hotplate test, an increase in licking duration in the tonic phase in the formalin test; males (I, II, III) and females (II) showed an increase in the time of immobility in the forced swimming test; females (II) showed decreased level of anxiety-like behavior in the elevated plus maze; males (I and II) displayed spatial learning disability.

Conclusions Thus, neonatal repeated inflammatory pain strengthened pain-related behavior caused by the same chemical agent and changed adaptive behaviors in adolescent rats.

Acknowledgement: This work was supported by the RFBR (N14-04-01381).

THE ANALGESIC EFFICACY OF MORPHINE-KETAMINE-MAGNESIUM COMBINATION IS INFLUENCED BY THE ORDER OF MEDICATION ADMINISTRATION

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Background and aims: Ketamine and magnesium, both N-methyl-D-aspartate (NMDA) receptor antagonists, enhance the antinociceptive effects of opioid analgesics in different animal models of pain, as well as in humans. This study aimed at evaluating whether magnesium sulphate added to morphine-ketamine combination produces a higher level of analgesia.

Methods: Analgesic activity was assessed by tail-immersion test in male Wistar rats (200-250 g).

Results: Magnesium sulphate (0.5-60 mg/kg, s.c.) and ketamine (5-30 mg/kg, i.p.) administered alone did not produce any effect. Magnesium sulphate (5 and 60 mg/kg) and ketamine (5 and 30 mg/kg) increased the antinociceptive effect of morphine (2.6 mg/kg, i.p.). Magnesium sulphate (5 mg/kg) increased the antinociceptive effect of the morphine (2.6 mg/kg)-ketamine (2.5 or 5 mg/kg) combination when magnesium sulphate was added to morphine after, and not before ketamine. It is also demonstrated that magnesium sulphate prolonged the duration of the antinociceptive effect of the morphine-ketamine combination. Low dose of morphine (2.6 mg/kg), ketamine (5 mg/kg) and magnesium sulfate (5 mg/kg) given together did not cause motor impairment that could be verified on a rotarod test. The antinociceptive effect of the triple combination was readily antagonized with naloxone (3 mg/kg, s.c.), a nonselective antagonist of opioid receptors, indicating that the effect is mediated *via* opioid receptors.

Conclusions: This study revealed that the efficacy of the morphine-ketamine-magnesium sulphate combination in tail-immersion test in rats is influenced by the order of medication administration; a higher level of activity is demonstrated only when ketamine is added to morphine before magnesium sulphate.

EFIC5-0064

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

INTRAPERITONEALLY ADMINISTERED LIDOCAINE ATTENUATES THERMAL ALLODYNIA IN A MURINE SECOND HIT CHRONIC CONSTRICTION INJURY MODEL

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Background

Neuropathic pain is defined as pain arising after nerve injury and is common after surgery.

Methods

Mice underwent mechanical ventilation (MV) and were allocated to receive sham (MV-sham) or chronic constriction injury (MV-CCI) surgery. Postoperative systemic cytokines were determined on day 0 and 16 and sensory testing was performed on day 0, 3, 7 and 16 by cold plate test (number of lifts (NOL) and cumulative reaction time (CRT)) and von Frey test.

Results

MV-Sham showed an increase in interleukin (IL)-1 β and tumor necrosis factor (TNF)- α compared with MV, MV-CCI lido in keratinocyte derived chemokine (KC) compared with MV. MV-CCI showed a difference between the left and right paw on day 7, MV-CCI lido on day 7 and 16. The NOL on the left paw was lower in MV-sham compared with MV-CCI and lower in the MV-CCI lido compared with MV-CCI mice on day 16.

The left and right hind paw were different in CCI group on day 3 and 7. In MV-CCI lido the left and hind paw were different on day 7. The CRT was higher in MV-CCI mice than MV-sham mice on day 16 and in MV-CCI mice than in MV-CCI lido mice. The left hind paw scored lower on maximal force before withdrawal on day 16 in the CCI lido group than the right hind paw.

Conclusion

We demonstrated that nerve injury and not systemic inflammatory response seems mandatory for development of neuropathic pain in a 'second-hit' model. Lidocaine attenuates cold allodynia in mice.

EFIC5-0153

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

EFFECTS OF PREGABALIN AND DULOXETINE ON NEUROTRANSMITTERS IN THE SPINAL DORSAL HORN OF RESERPINE-INDUCED MYALGIA RATS

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Background and Aims: Fibromyalgia is a prevalent musculoskeletal disorder characterized by chronic widespread pain that significantly reduces the quality of life of patients. Reserpine-induced myalgia (RIM) is a putative rat model of fibromyalgia in which muscle pressure thresholds and monoamine content in the brain and spinal cord are decreased.

Methods: We investigated the effects of pregabalin and duloxetine on the levels of extracellular neurotransmitters in the spinal dorsal horn of RIM rats using microdialysis.

Results: The monoamines norepinephrine, dopamine, and serotonin were detected using high-performance liquid chromatography with electrochemical detection (HPLC-ECD), and glutamate and GABA were detected using liquid chromatography-mass spectrometry (LC-MS). Although the levels of these three monoamines were significantly lower in the spinal cord of RIM rats than in normal rats, levels of glutamate and GABA did not differ markedly. Duloxetine dose-dependently increased levels of the three monoamines in normal and RIM rats. In contrast, pregabalin did not increase transmitter levels in normal rats but did increase norepinephrine levels in RIM rats.

Conclusions: These results suggest that the antinociceptive mechanisms for pregabalin and duloxetine in the spinal cord differ considerably.

PRONOCICEPTIVE EFFECTS OF A TRPA1 CHANNEL AGONIST METHYLGLYOXAL IN HEALTHY CONTROL AND DIABETIC ANIMALS

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Background and aims: Methylglyoxal (MG), a reactive carbonyl compound generated in diabetes mellitus (DM), produce sustained activation of the TRPA1 ion channel. It is, however, not known whether MG produces mechanical hypersensitivity or ongoing pain involved in peripheral neuropathy.

Methods: Limb withdrawal to monofilaments was used as an index of MG-induced hypersensitivity, and observation of sustained pain-like behavior and conditioned place-avoidance (CPA) test were used to assess ongoing pain. MG and Chembridge-5861528 (CHEM), a selective TRPA1 channel antagonist, or A-803467, a selective Na_v1.8 channel antagonist, were administered intradermally (i.d.) to hind paw of control animals. In vitro calcium imaging was used to assess whether MG induces sustained activation of TRPA1 channel of dorsal root ganglion (DRG) neurons. Moreover, it was examined whether the pronociceptive effect of MG is changed following its sustained endogenous release in DM induced by streptozotocin (STZ, 50-60 mg/kg i.p.).

Results: Behavioral tests showed that i.d. administration of MG produced mechanical hypersensitivity and ongoing pain behavior in control animals, which effects were reduced in DM. CHEM and A-803467 treatment at a dose suppressing MG-induced mechanical hypersensitivity failed to suppress MG-induced ongoing pain behavior. In vitro calcium imaging results indicated that sustained MG-mediated calcium inflow in DRG neurons through the TRPA1 channels was enhanced in DM.

Conclusions: The results suggest that MG induces hypersensitivity and ongoing pain that are reduced with prolongation of DM. Moreover, the MG-induced mechanical hypersensitivity can be more effectively reversed by a TRPA1 and Na_v1.8 channel antagonists than the MG-induced ongoing pain behavior.

EFFECTS OF LIDOCAINE-LOADED POLOXAMER/ALGINATE/CACL2 MIXTURE IN A RAT MODEL OF INCISIONAL PAIN*G. Choi¹, H. Kang¹, C. Baek¹, Y. Jung¹, Y. Woo¹*¹Anesthesiology and Pain Medicine, Chung-Ang University Hospital, Seoul, Korea**Background**

This study is purposed to identify the effect of lidocaine-loaded poloxamer/alginate/CaCl₂ mixture(PACM) in a rat model of incisional pain.

Methods

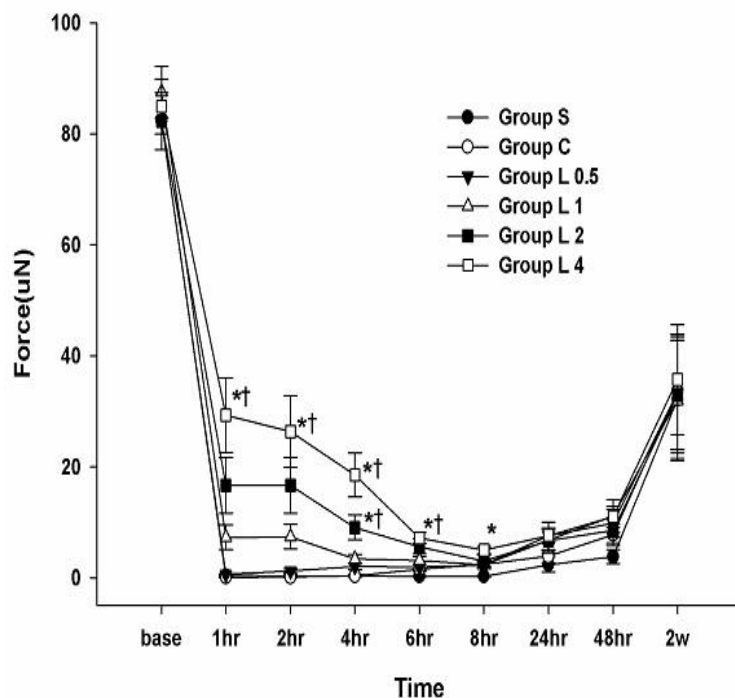
Ninety rats were allocated in six groups: sham group S; control group C; lidocaine-loaded PACM groups L0.5, L1, L2, and L4. After plantar incision and adhesion formation, PACM in group C and 0.5%, 1%, 2%, and 4% lidocaine-loaded PACMs in groups L0.5, L1, L2, and L4 were applied at incision site. Mechanical withdrawal threshold(MWT) of the hind paw was measured by von Frey filament. Serum levels of tumor necrosis factor(TNF)- α , interleukin(IL)-1 β , and IL-6 were measured. Two weeks after surgery, inflammation and fibrosis were assessed under microscopy.

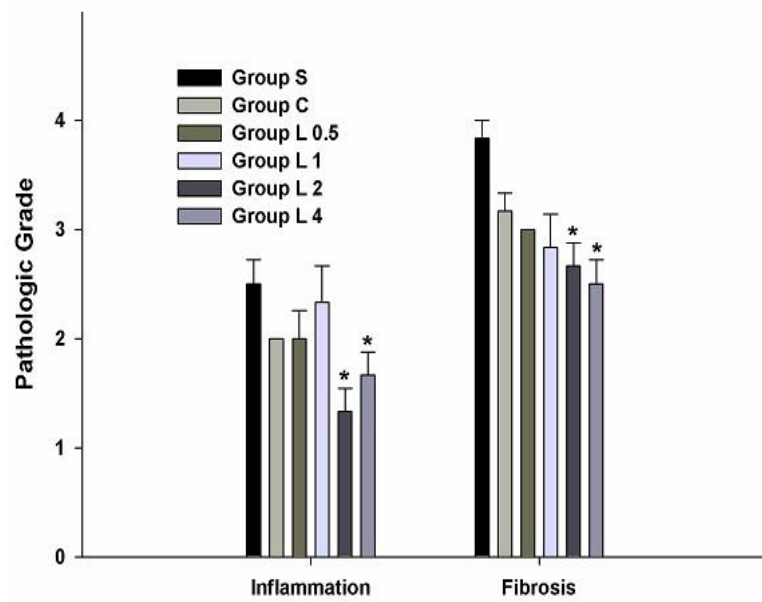
Results

MWT was significantly increased in group L4 compared to group S at 1, 2, 4, 6, and 8 hours after surgery; compared with group C at 1, 2, 4, and 6 hours after surgery. In group L2, MWT was significantly elevated compared to groups S and C at 4 hours after surgery. Inflammation and fibrosis showed a significant reduction in groups L2 and L4 compared to group S. Serum levels of TNF- α , IL 1 β , and IL-6 were significantly reduced: at 1 hour after surgery in groups L1, L2, and L4 compared to groups S, C, and L0.5; at 2 hours surgery in groups L0.5, L1, L2, and L4 compared to group C; and at 48 hours after surgery in group L1, 2, and 4 compared to group C.

Conclusions

Lidocaine-loaded PACM reduces postoperative pain and lidocaine raises anti-adhesive effect of PACM.





EFIC5-0209

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

A PAN-TRK INHIBITOR WITH LOW BRAIN PENETRATION EXERTS POTENT ANALGESIC EFFECTS IN RAT VARIOUS PAIN MODELS VIA PERIPHERAL TRKA INHIBITION

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Background and aims:

Peripheral tropomyosin receptor kinase (Trk) A is a promising target for inhibition of the signaling processes that contribute to the manifestation of chronic pain. The importance of these processes has been highlighted by the anti-NGF antibodies which have demonstrated significant analgesic effects when compared to non-opiate medications in patients with chronic pain. We discovered an orally available small molecule pan-Trk (TrkA, TrkB and TrkC) inhibitor with low brain penetration and evaluated its analgesic effects in rat NGF-induced hyperalgesia, inflammatory, osteoarthritis and cancer pain models.

Methods:

The pan-Trk inhibitor was administered orally 12 hours before NGF injection or twice a day for 4 or 8 days in pain models. The pain-related behavior was evaluated by a Randall-Selitto analgesiometer, knee bending or weight bearing on hind legs.

Results:

The pan-Trk inhibitor inhibited NGF-induced hyperalgesia in a dose-dependent manner. At doses of 1 to 3 mg/kg b.i.d. this compound was comparable to diclofenac sodium (3 mg/kg b.i.d.) in the inflammatory pain model and comparable to morphine (3 mg/kg) in the osteoarthritic and cancer pain models. The effective plasma concentrations of this compound in these pain models were similar to that at 3 mg/kg; the dose required to significantly inhibit NGF-induced hyperalgesia in rats.

Conclusion:

This pan-Trk inhibitor showed potent analgesic effects in various pain models comparable to pharmacotherapies currently in use for the management of pain. These data demonstrate that this novel small molecule with low brain penetration may exert its potent analgesic effects via peripheral TrkA inhibition.

EFIC5-0264

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

**REGULATION OF NEURONAL ACTIVITY OF THE ANTERIOR CINGULATE CORTEX
COULD RELIEVE MECHANICAL ALLODYNIA.**

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The neuronal activity of anterior cingulate cortex (ACC) has been proved to up-regulated after pain. However, if to cease the upregulated neuronal activity can relief pain remains to be questioned. We hypothesized that suppressing the upregulated neuronal activity could relief the painful condition, by using medical agent, optogenetic and chemogenetic tools. By musimol, a selective GABA_A receptor agonist, intracerebral injection, mechanical pain threshold measured by von frey could be elevated which is low after bone cancer pain establishment. By AAV-HaloRhodopsin injection in ACC, laser trigger behavioral change. By AAV-hM4D injection in ACC, the chemical agent, CNO, could relieve mechanical threshold.

CHRONIC CONSTRICTION INJURY TRIGGERS ALTERED BEHAVIOUR IN THE RADIAL-MAZE TASK IN RATS

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Background and aims: Chronic constriction injury (CCI) evokes allodynia in all rats, but evokes complex behavioural disturbances in only a sub-group (Monassi et al., 2003). Spared nerve injury leads to impaired learning on the radial-maze task (Ren et al., 2011). We examined whether rats that had pre-learned the radial-maze task had impaired memory after CCI.

Methods: Rats underwent radial-maze, von Frey and rota-rod testing before and after CCI (n=16) or sham (n=10). During each trial the same 4 arms were baited. Total entries, working memory errors (re-entry into a baited arm) and time spent in the centre atrium before choosing an arm, were recorded.

Results: CCI rats exhibited allodynia and motor impairment compared to sham (both $P < 0.001$). On the radial-maze there were no significant differences in entries or errors, although centre time was significantly increased after CCI ($P < 0.05$). A sub-group (n=4) of 'Affected' rats showed a large increase in centre time (33-fold versus sham, 6-fold versus 'Unaffected' rats). In 'Unaffected' rats (n=12), an increase in centre time was correlated with a decrease in working memory errors ($r^2 = 0.81$, $P < 0.001$).

Conclusions: CCI had no effect on memory when the maze layout was pre-learned. CCI rats took longer to complete the task, taking more time to choose an arm, particularly the 'Affected' rats. The relationship between time to choose an arm and working memory errors in the 'Unaffected' rats may represent an altered strategy to maintain performance after CCI.

References: Monassi et al., 2003, *E.J. Neurosci*, 17, 1907-20; Ren et al., 2011, *Neuropsychopharmacol*, 36, 979-992.

EFIC5-0415

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

METABOTROPIC GLUTAMATE RECEPTOR SIGNALING IS INVOLVED IN CANCER PAIN AND CANCER GROWTH

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Background and aims

Recently, it is known that peripheral metabotropic glutamate receptor (mGluR) 1 and 5 are involved in abnormal pain following peripheral nerve and tissue injury. Moreover, mGluRs express in cancer cell membrane and mGluRs signaling may induce cancer cell proliferation. However, involvement of mGluR5 signaling in cancer pain and cancer growth is not fully clarified. The aim is to clarify the mechanisms underlying initiation/maintenance of cancer pain and cancer cell proliferation.

Methods

The head-withdrawal reflex threshold (HWRT) to mechanical stimulation of the lateral facial skin and facial skin thickness were analyzed in facial SCC-158-inoculated (1.0×10^6 cells/30 μ l with PBS) rats. The expression of mGluR5 in cultured SCC-158 cells and SCC-158-inoculated facial skin was examined. Moreover, we analyzed HWRT to mechanical stimulation and facial skin thickness in facial SCC-158 inoculated rats with mGluR5 selective antagonist MTEP (10 mM, 2.5 μ l/h) continuous administration.

Results

HWRT to mechanical stimulation was significantly decreased and facial skin thickness was significantly increased in SCC-158-inoculated rats compared to PBS-injected rats. mGluR5 was expressed in cultured SCC-158 cells, Ki-67 immunoreactive cells in tumor tissue and peripheral nerve ending. The decreased HWRT and the increased facial skin thickness were significantly recovered by MTEP continuous administration.

Conclusions

These findings suggest that peripheral mGluR5 signaling is involved in cancer induced mechanical hypersensitivity and cancer growth in orofacial region.

THE THERAPEUTIC EFFECT OF HIGH ARTERIAL OXYGEN CONCENTRATION ON CFA-INDUCED ARTHRITIS

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Hyperbaric treatment is considered to decrease inflammatory pain by increasing dissolved oxygen concentration and these changes could have favorable effects on the arthritic joint in the previous studies.

Our study was to measure the effect of high arterial oxygen concentration on rheumatoid arthritic knee.

Following injection of complete Freund's adjuvant (CFA) into one side of the knee joint, 8 rats were randomly assigned to the study and control group. 2 hours of different oxygen concentration were supplied to rats with mouth mask for 4 times during 12 days. Control rats were raised in normal condition. Pain behavioral tests were performed initially and during test periods and histological analysis was taken at mid and end of the test day.

1, 2, 4, 6, 10 L of oxygen supplementation were equivalent for higher than 400 mmHg of pO₂ in arterial blood gas analysis. In both groups, the weight bearing force (WB) decreased from the first day and lowest at 3rd day and then gradually increased until 12th day of experiment. WB in study group increased significantly after 3rd oxygen supplementation than control group. The histology analysis of the study group revealed a reduction of the formation of the pannus, invasion of the intra-articulation cavity and erosion of the articulation cartilage and bone than control group.

High arterial oxygen concentration showed the favorable effect on pain behavior and decrease inflammation of the arthritic knee joints. The therapeutic effect of hyperbaric treatment might be attributed to the increased arterial oxygen concentration through inhalation.

CHRONIC PAIN AND EMOTIONAL STRESS AFFECTS ANXIETY-LIKE BEHAVIOUR AND LONG TERM POTENTIATION (LTP) IN THE RAT DENTATE GYRUS (DG)

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Background and aims: Chronic pain is an emotional condition as well as a physical sensation. It is a complex experience that affects thought, mood, and behavior. Clinical reports estimate that over half of chronic pain patients also possess a robust stress-like component, reflecting a significant affective cognitive aspect. Although many clinical aspects were studied, little emphasis has been placed by pain neurobiologists on studying the mechanisms contributing to the emotional component of pain or its impact on perception and cognitive function. The physiologic basis for the comorbidity of chronic pain and depressive illnesses is not well understood, impeding appropriate therapeutic approaches from being adopted. This study aimed at examining the impact of chronic pain on anxiety-like behaviour and on neuronal activity and plasticity in the dentate gyrus (DG).

Methods: Sprague-Dawley rats were divided into two groups: one was exposed to the Sciatic nerve ligation (SNL) procedure of neuropathic pain, and the other to a modified Chronic Mild Stress model. The effects on behaviour and on long-term potentiation (LTP), local circuit activity frequency-dependent inhibition and paired-pulse inhibition in the DG were assessed.

Results: neuropathic pain rats and CMS rats showed anxiety-like behaviour in the EPM test and in a novel place exploration paradigm. Alterations in activity and plasticity in the DG also reflected chronic pain experience and stress.

Conclusions: chronic pain and emotional stress seem to affect anxiety-like behaviour in a similar manner. The DG seems to be involved in the processing of the translation of pain sensing to distress experiencing.

THE COMPARISON BETWEEN HYPERBARIC EXPOSURE AND OXYGEN INHALATION FOR REDUCING INFLAMMATORY PAIN

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Since the mechanism of hyperbaric treatment was considered to increase the arterial oxygen, it might be more convenient to supply the oxygen by inhalation.

Our study was to examine the relative contribution of oxygen inhalation (OI) and hyperbaric treatment (HBT) for reducing inflammatory pain.

Following injection of complete Freund's adjuvant (CFA) into one side of knee joint, 20 rats were randomly assigned to control, OI and HBT group. Control rats were raised in normal condition. OI rats were assigned for two hours three times per week in normal condition supplied with 1L/min oxygen for 12 days. HBT rats were placed under 1.5 atmospheres absolute (ATA) in a hyperbaric chamber for two hours per day. Pain behavioral tests were performed two days after oxygen supply in OI and everyday in HBT. Histological analyses of three groups were taken at mid and end of the test day.

After arthritis induction, the rats in all groups showed reduced WB of the affected limbs and increased WB at the end of the test period. OI and HBT showed a significant increase of WB at the 3, 8, 10th day compared to the control group. There was no difference of WB between OI and HBT in all test periods and all group showed no statistical difference at the end of the test day.

Our findings suggested that the reducing effect of inflammation of HBT was similar to that of the OI. We can suggest that OI might be a convenient method for reducing inflammatory pain.

EFIC5-0444

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

PAIN PROCESSING AND COPING WITH SOCIAL STRESS IN RATS EXPOSED TO ADVERSIVE EARLY LIFE EVENTS

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Background and Aims:

Early life stress leads to functional alterations of the nervous, endocrine and immune systems potentially affecting pain sensitivity and coping with stress in later life. We assessed the impact of maternal separation (MS) on the processing of chronic inflammatory pain and on social stress (SS) reactivity in adulthood.

Methods:

Behavioural and biochemical parameters were assessed in four groups of rats: controls (C), MS, SS and MS+SS. MS consisted in separating pups from the dam from postnatal day 2 to 12 for 3 hours per day. For SS, the cage-mates changed twice a week from weeks 8 to 14. Baseline mechanical and thermal pain thresholds were recorded before and after SS. Anxiety and depression-related behavioural assessments were performed on weeks 8, 10, 12 and 14. Then, chronic inflammation was induced by intraplantar injection of complete Freund's adjuvant and pain sensitivity was assessed for 21 days. After decapitation, spinal cord levels L5-L6 were removed and RNA was extracted for qPCR.

Results:

The 2 stressors affected animal metabolism (weight) and behaviour in a sustained way. C and MS did not display any differences in basal pain thresholds. SS reduced basal mechanical sensitivity. Under inflammatory conditions, MS and SS showed differential changes in sensitivity to noxious stimulation and differential expression of biochemical mediators. Both groups developed depression-like behaviour.

Conclusion:

The two types of stressors used in the present study had comparable effects on emotional state but differentially affected nociceptive processing. The recorded biochemical parameters will provide clues for the underlying mechanisms.

REPEATED INTRA-ARTICULAR INJECTION OF NGF IN NAIVE MICE DOES NOT INDUCE HYPERALGESIA.

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Background and Aims

Chronic joint pain is a major clinical problem. Recent studies have focused on the contribution of nerve growth factor (NGF), which is increased in human osteoarthritis synovium, to joint pain. Repeated cutaneous injection of NGF produces prolonged hyperalgesia in rats, whether similar effects are associated with knee joint NGF is unknown. This study aims to quantify effects of repeated intra-articular injection of NGF on localised pain on loading (weight-bearing asymmetry) and distal (hindpaw withdrawal thresholds) pain behaviour in mice.

Methods

Mice received an intra-articular injection of either NGF (10µg/5µl) or saline (5µl), four days later mice received another intra-articular injection of either NGF or saline. Pain behaviour was assessed for 3 days following injection. Data were analysed by 2 way ANOVA or Kruskal-Wallis as appropriate.

Results

Intra-articular injection of NGF produced significant weight-bearing asymmetry ($4.29\% \pm 1.05$, $p < 0.001$) compared to saline ($-0.643\% \pm 0.858$) and lowered hindpaw withdrawal thresholds ($1.15\text{g} \pm 0.13$, $p < 0.001$) compared to saline ($1.8\text{g} \pm 0.09$). Intra-articular injection of NGF 96 hours later resulted in a comparable magnitude of weight-bearing asymmetry irrespective of whether the earlier injection was saline ($7.66\% \pm 2.9$) or NGF ($5.02\% \pm 1.42$). Similarly, a second NGF exposure produced comparable lowering of hindpaw withdrawal thresholds irrespective of earlier treatment.

Conclusions

This study suggests that repeated intra-articular injection of NGF does not lead to prolonged hyperalgesic responses. Previous studies report a requirement of IB4+ neurons for hyperalgesic priming, the number of which is relatively low in the knee joint.

SYNERGIC EFFECTS OF CARBAMAZEPINE IN BINARY COMBINATIONS WITH TRAMADOL AND TENOXICAM

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Background and Aims

Anticonvulsant drugs are considered choice adjuvants for neuropathic pain. There is a considerable variability of analgesia for the anticonvulsant drugs, some subjects obtaining the analgesia at lower plasma concentrations than the therapeutic levels for epilepsy, while others need considerably higher doses. Beginning from this observation, the present work proposes the analysis of binary combinations of carbamazepine with anti-inflammatory and analgesic drugs, in experimental models in mice.

Methods

The present study used male Swiss mice, 20-25 g (Cantacuzino Institute Bucharest) kept in controlled temperature conditions ($21^{\circ}\text{C} \pm 2^{\circ}\text{C}$) and a light/dark cycle of 12/12 hours.

For the evaluation of the analgesic and/or anti-inflammatory action we used the Randall-Selitto test and the test of the carrageenan-induced inflammatory oedema. Isobolar analysis was used.

The experimental procedures used in this study were made according to the international bioethics regulations, rules of the Bioethics Commission of the University „Grigore T. Popa” Iași, and the IASP guidelines.

Results

We demonstrated the synergism between carbamazepine and tenoxicam ($Z_{\text{add}} = 17,26 \pm 2,84$ mg/kg, $Z_{\text{mix}} = 2,87 \pm 0,25$ mg/kg, $Z_{\text{mix}} < Z_{\text{add}}$, $\gamma = 0,166$ analgesic action, $Z_{\text{mix}} = 6,41 \pm 0,10$ mg/kg, $Z_{\text{mix}} < Z_{\text{add}}$, $\gamma = 0,371$ antiinflammatory action) and carbamazepine-tramadol ($Z_{\text{add}} = 18,01 \pm 2,8$ mg/kg, $Z_{\text{mix}} = 3,25 \pm 0,06$ mg/kg, $Z_{\text{mix}} < Z_{\text{add}}$, $\gamma = 0,181$, analgesic action, $Z_{\text{mix}} = 10,09 \pm 1,49$ mg/kg, $Z_{\text{mix}} < Z_{\text{add}}$, $\gamma = 0,560$, antiinflammatory action).

Conclusions

Demonstrating the synergism between the investigated combinations opens new perspectives for the study of combinations among members of those families.

EFIC5-0548

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

A LARGE ANIMAL MODEL FOR COMPLEX REGIONAL PAIN SYNDROME – EQUINE LAMINITIS

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Background and aims:

Laminitis is an overtly painful condition affecting the feet of horses, and very of the structural damage found on radiography (and post-mortem histology) is not representative for the degree of pain noted in the clinical examination. In many horses, the inability to manage the pain despite using medications (e.g. gabapentine, pentoxifylline, ketamine), rather than the degree tissue destruction leads to humane destruction of the animal. The aim of this poster is to outline the similarities between this equine disease and the complex regional pain syndrome (CRPS) in man.

Methods: Based on the Budapest 2003 clinical diagnostic criteria of CRPS, studies published in English and listed in Scopus® 2005-2014 on induced or clinical laminitis in horses were examined for descriptions of clinical signs of CRPS. A total of 40 cases of induced laminitis and 828 cases of clinical laminitis were included.

Results: All reports described the continuing pain, as the reluctance to ambulate or to bear weight; this was not clearly correlated with structural changes, e.g. on radiographs. In all reports, changes in the foot (changes in horn growth and/or edema) were described. Changes in foot temperature were described in some reports. Sweating (changes/asymmetry) was not described in any report.

Conclusions: In some studies, the descriptions of signs/symptoms are inadequate to accept/refute CRPS criteria. Over all studies, the majority of clinical diagnostic criteria for CRPS are fulfilled in equine laminitis, possibly allowing comparative investigations of CRPS. One dissimilarity is that commonly more than one limb is affected.

NEUROPATHIC PAIN IN A RAT MODEL OF TYPE 1 DIABETES: THERAPEUTIC EFFICACY OF NOVEL MESENCHYMAL STEM CELL POPULATIONS

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Background and aims: Diabetic neuropathy (DN) is the most common complication of diabetes, with a third of the patients developing painful DN. We have been investigating the therapeutic potential of novel bone marrow-derived mesenchymal stem cell (MSC) populations in the streptozotocin (STZ)-induced Wistar rat model of painful DN. These MSC populations result from the development of a new platform technology for MSC based on the Orbsen Therapeutics Ltd. discovery of a novel MSC marker, CD362 (<http://www.reddstar.eu/>).

Methods: Human heterogeneous plastic adherent (PA)-MSC, CD362⁺ MSC, CD362⁻ MSC, or vehicle were intravenously administered to STZ rats 1 week after STZ injection. The efficacy of the different MSC populations in preventing the development of behavioural signs of painful DN was evaluated for 9 weeks. The Randall-Selitto paw-pressure test and the Hargreaves test were used to evaluate mechanical and thermal sensitivities, respectively. Body weights, blood glucose levels, and blood glycated haemoglobin A1C (Hb^{A1C}) levels were also monitored.

Results: Treatment of STZ rats with CD362⁺ MSCs significantly improved mechanical hyperalgesia and prevented the development of thermal hypoalgesia as compared to non-treated STZ rats. Metabolic parameters typical of this disease model (impaired weight gain, hyperglycaemia, and elevated Hb^{A1C} levels) were not affected by MSC treatment.

Conclusions: Our data strongly suggest that administration of the most efficacious MSC population—CD362⁺ MSC—may be a useful strategy to manage painful DN symptoms. We are currently evaluating the mechanisms underlying the effects of these MSCs.

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PARACETAMOL TREATMENT DURING REPETITIVE EXPERIMENTAL NEONATAL PROCEDURAL PAIN: SHORT- AND LONG-TERM EFFECTS

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In the neonatal intensive care unit (NICU), new-born infants can undergo up to 14 painful procedures per day. Clinical and experimental data suggests that this early stimulation of the developing nociceptive system can lead to short- and long-term consequences for nociception, and this proposes a need for pain management during this vulnerable period in life. Hence the aim of this study is to analyze the short- and long-term consequences of neonatal paracetamol (acetaminophen) treatment on pain behavior in an experimental rat model of neonatal pain. To that, a repetitive needle prick model was developed and used, in which neonatal rats received four needle pricks into the left hind-paw per day from postnatal day 0 to day 7. Paracetamol (50 Mg/kg/day s.c.) was administered daily during this early life period and sensitivity to mechanical stimuli was compared to a needle-prick group and to a tactile control group. At the age of 8 weeks, all animals underwent an ipsilateral paw-incision, modelling postoperative pain, and the duration of hypersensitivity was assessed. We noted no acute effect of paracetamol on mechanical hypersensitivity during the first postnatal week, whereas needle pricking led to hypersensitivity at several time-points. Baseline sensitivity from three to eight weeks was not altered by either needle pricking or neonatal paracetamol administration. The long-term effect of neonatal repetitive needle pricking resulted in an increased duration of the post-operative mechanical hypersensitivity in young adults. Neonatal paracetamol administration resulted in a reduction in the duration of post-operative mechanical hypersensitivity in later life.

ANIMAL MODELS OF CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: To assess the impact of study design characteristics and risk of bias on reported outcomes by conducting a systematic review and meta-analysis of published studies reporting *in vivo* modelling of chemotherapy-induced peripheral neuropathy (CIPN).

Methods: We systematically searched online databases in September 2012 to identify relevant publications. We assessed study quality against an 8-item checklist, extracted data to the CAMARADES database and performed DerSimonian and Laird random effects standardised mean difference meta-analysis and metaregression using STATA. We assessed for publication bias using Egger regression and trim and fill analysis.

Results: 176 publications met our inclusion criteria, 125 of these tested drug interventions. Reporting of measures to minimise the risk of bias was low; 12% reported randomisation to model group, 18% reported randomisation to treatment group, 46% reported blinded assessment of outcome, 2% reported the use of a sample size calculation and no study reported allocation concealment. Reporting of animal exclusions, chemotherapy drug, sex and species of animal accounted for a large proportion of the heterogeneity. Funnel plot asymmetry and Egger regression suggested publication bias was present. Trim and fill suggests 8 missing studies and reduced the overall summary of effect by 25% (0.4 (0.1-0.7 95% CI) SMD to 0.3 (0.02-0.6) SMD).

Conclusions: We observed that study quality across the literature was relatively low. Reporting of animal exclusions, chemotherapy drug, species and sex had an impact on reported behavioural outcomes. Publication bias appears to impact preclinical neuropathic pain research. Future study design should take account of these factors.

MICRORNA CHANGES IN THE DORSAL ROOT GANGLION OF RATS WITH SPINAL NERVE LIGATION, DORSAL ROOT LIGATION, OR VENTRAL ROOT LIGATION

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Background: A critical roles of microRNAs in the pathophysiology of neuropathic pain have been emerging. However, altering miRNAs expression in dorsal root ganglion (DRG) in different peripheral nerve injury and its relationship to neuropathic pain are poorly understood. Aim of the present study was to compare the miRNA expression profiles in DRG in three models of peripheral neuropathy which included spinal nerve ligation (SNL), dorsal root ligation (DRL), and ventral root ligation (VRL).

Methods: Rats received different kind of peripheral neuropathy injury at the L5 spinal nerve which include SNL, DRL or VRL. Foot-lift response to mechanical and thermal stimulation of the ipsilateral hindpaw were assessed. DRG obtained after 7 days of SNL, DRL, or VRL were examined using miRNA array and real-time RT-PCR for detecting dysregulated miRNAs expression.

Results: SNL produced rapid and profound mechanical allodynia. VRL resulted in intense mechanical allodynia; however, DRL provoked milder but progressive behavioral changes. When compare with sham-operated rats, 84 miRNAs in the rats with SNL were differentially expressed, including 35 miRNAs downregulated, 46 miRNAs in the rats with DRL that were differentially expressed, including 21 miRNAs downregulated, 187 miRNAs in the rats with VRL were differentially expressed, including 41 miRNAs downregulated. Among these differentially expressed miRNAs, miR-21 is the highest upregulated in the injured DRG neurons in all these three peripheral neuropathy models.

Conclusion: In this study, we demonstrated the distinct expression pattern of miRNAs in DRG in different peripheral nerve injury models and their correlation with neuropathic pain.

EFIC5-0758

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

THERMAL HYPERALGESIA IN TWO MODELS OF SPINAL CORD INJURY IN MICE: GRADED PHOTOCHEMICAL INJURY AND WEIGHT-DROP CONTUSION

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Background and aims: Weight-drop and automatic contusion devices (e.g. Ohio State University-OSU device, Infinite Horizon-IH device), aneurysm clip compression, and photochemical injury are the main models of traumatic Spinal Cord Injury (SCI). Most experimental studies evaluate motor recovery in these experimental models of SCI, but few studies also evaluate nociceptive responses in animals with traumatic SCI. The aim of the present study is to evaluate thermal hyperalgesia in mice after photochemical injury and weight-drop contusion.

Materials and methods: Two groups of female adult Balb-c mice were subjected to dorsal laminectomy at T8-T9 vertebrae. Spinal cords of one group were contused using the weight-drop technique (2 gr or 3 gr; 25 mm). The spinal cords of the other group were bathed with rose Bengal (1.5%; Sigma-Aldrich) for 10 min and illuminated at 95 kLux for 1, 5 and 10 min. Sham animals were subjected to dorsal laminectomy without contusion or photochemical injury. Then, thermal hyperalgesia was evaluated weekly during the first 8 weeks post-surgery using the Hargreaves test.

Results: The withdrawal latency of SCI mice was significantly lower than those observed in sham animals. After SCI, animals with higher degree of injury showed lower withdrawal latency than those observed in animals with lesser degree of injury. This pattern was observed in both experimental models of traumatic SCI.

Conclusions: In mice subjected to photochemical and mechanical SCI the thermal hyperalgesia showed a degree of injury-response. These findings suggest that both experimental models may be suitable for assaying treatments against pain.

EFIC5-0759

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

THERMAL HYPERALGESIA AND NUMBER OF CALBINDIN-D-28K POSITIVE CELLS IN DORSAL HORN OF MICE TREATED WITH EGCG AFTER SPINAL CORD INJURY

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Background and aims: Epigallocatechin-3-gallate (EGCG) promotes neuroprotection, motor recovery and alleviates neuropathic pain after spinal cord injury (SCI). Calbindin-D-28K (CB) is present in GABAergic interneurons localized predominantly in the superficial dorsal horn (laminae I, II, and III), and CB-immunoreactivity is related to afferent inputs. The aim of present study is to evaluate thermal hyperalgesia and number of calbinin-D-28K positive cells in mice treated with EGCG after spinal cord contusion.

Materials and methods: Female adult Balb-c mice were subjected to dorsal laminectomy at T8-T9 vertebrae and the exposed spinal cord was contused using the weight-drop technique (2 gr; 25 mm). Animals were treated with EGCG (30 mg/kg; i.p.) diluted in DMSO/saline and with DMSO/saline (equivalent volume; i.p.) daily during the first week post-surgery. At 7 and 14 days post-surgery thermal hyperalgesia (withdrawal latency) was evaluated using the plantar test. Then, animals were perfused and processed by immunohistochemical techniques for observed CB-positive cells in dorsal horn. Counts of CB-cells were made directly under an epifluorescent microscope with appropriated filters.

Results: The withdrawal latency of SCI mice treated with EGCG was significantly higher than those observed in DMSO-treated animals. Significantly higher number of CB-positive cells was observed in the dorsal horn of EGCG-treated animals respect to DMSO-treated mice.

Conclusions: At short time, EGCG treatment alleviates thermal hyperalgesia, and increases the number of CB-positive cells in dorsal horn, suggesting that this alleviation of pain response may be results in an increase of GABAergic inputs over nociceptive spinal cord neurons.

AMPLITUDE-DEPENDENT EFFECTS OF SUBCUTANEOUS STIMULATION IN A RODENT MODEL OF NEUROPATHIC PAIN

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Background and Aims: In order to establish a foundation for future mechanistic studies, a systematic exploration of optimal parameters becomes necessary. We used a rodent model to assess the influence of varying stimulation amplitude on effectiveness outcomes. We hypothesized that higher intensity stimulation would produce more robust antihyperalgesia

Methods: Rats were implanted with electrodes in the subcutaneous space concurrently with nerve injury. Rats were tested using von Frey filaments and received electrical stimulation. The parameters used were pulse width of 0.25 msec and frequency of 60 Hz applied for 30 minutes. The amplitude was varied using the amplitude required to obtain a muscle contraction (muscle threshold, MT) as a reference.

Results: Rats receiving stimulation at amplitudes of 25 and 50% did not show statistical significant effects during stimulation. Amplitudes of 75 and 90% showed a significant reduction ($P < 0.05$) of hypersensitivity compared to the sham stimulation. Both 75 and 90% also showed a carryover effect classified as a significant difference vs. controls at those specific time points. 100% of MT amplitude did not have any significant effect during or after stimulation

Conclusions: The present study demonstrated an amplitude dependent effect of subcutaneous stimulation. Lower stimulation amplitudes did not reduce hypersensitivity while stimulation was ON. Higher stimulation amplitudes resulted in significant reduction in hypersensitivity. There was a ceiling effect since the highest amplitude tested did not attenuate pain behaviors. These results suggest that higher amplitudes of subcutaneous stimulation might have more optimal results up to a certain level, suggesting the presence of a therapeutic window

EFIC5-0790

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

CDK5/P35 MODULATES OROFACIAL NOCICEPTION

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Background and Aims: Cyclin-dependent kinase 5 (Cdk5), a serine/threonine kinase, plays an important role in regulation of spinal nociceptive signaling and in mediating inflammation-induced hyperalgesia. However, the role of Cdk5 in orofacial pain remains unclear. The aim of the current study was to delineate precise role of Cdk5 and its coactivator p35 in response to orofacial mechanical, thermal and inflammation-induced nociception.

Methods: Since hyperalgesia is the distinctive sign of many orofacial pain conditions, using orofacial operant assays we have determined behavioral responses to either mechanical or thermal stimulation in the trigeminal region of the transgenic mice with either reduced or increased Cdk5 activity. Orofacial inflammation was induced by carrageenan injection into the mouse vibrissal pad.

Results: In response to noxious mechanical or thermal stimulation in the trigeminal area, transgenic mice with either reduced or increased Cdk5 activity showed inverse responses. Mice with increased Cdk5 activity displayed aversive behavior to mechanical and thermal stimuli. By contrast, mice deficient in Cdk5 activity exhibited mechanical and thermal hypoalgesia. Carrageenan injection into the mouse vibrissal pad induced acute inflammation accompanied by increased levels of proinflammatory cytokines and p35 in trigeminal ganglia and brainstem.

Conclusions: Using the orofacial operant assays on the genetically altered mice with either increased or decreased Cdk5/p35 activity, we have discovered that Cdk5/p35 activity plays a crucial role in modulating orofacial mechanical and thermal nociception. Cdk5/p35 also mediates acute orofacial inflammation. Thus, Cdk5/p35-mediated modulation of orofacial pain conditions makes it an attractive potential target for the development of novel analgesics.

EFIC5-0793

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

COMPARISON OF ANTINOCICEPTIVE EFFECTS OF STANDARD ANALGESICS IN ATTENUATING CARRAGEENAN-INDUCED MECHANICAL ALLODYNIA AND THERMAL HYPERALGESIA IN RATS

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Background and aims: Although the nociceptive response after intraplantar carrageenan injection in rats is classically evaluated by the thermal paw-withdrawal response, mechanical sensitization is also developed. Our aim was to compare the efficacies of different analgesics on mechanical allodynia (MA) and thermal hyperalgesia (TH).

Methods: Analgesic efficacies of drugs(ip) were evaluated 4 hours after intraplantar injection of λ -carrageenan (2%) in male rats. TH and MA were quantified by measuring hind paw withdrawal latency in response to thermal (plantar test) or mechanical stimulation (von Frey).

Results: Opioid agonists morphine and oxycodone fully reversed both carrageenan-induced TH and MA. Tramadol and tapentadol (opioid agonists and monoamine transporter inhibitors) also reduced both symptoms, but tapentadol did not reach full efficacy in MA. The NSAIDs paracetamol, celecoxib and naproxen fully reversed TH but paracetamol and celecoxib (40-160 mg/kg) did not significantly alter MA, whereas naproxen (80-160 mg/kg) was partially effective. Among antidepressants, reboxetine exhibited higher efficacy than duloxetine in TH whereas the opposite was observed in MA. Finally, the antiepileptic drug pregabalin (40-80 mg/kg) showed no effect on TH but reduced MA.

Conclusions: Analyzed analgesic drugs can be classified into three categories: 1) drugs with full efficacy in both MA and TH (morphine, oxycodone, and tramadol); 2) drugs with preferential activity in TH, with no/partial efficacy in MA (tapentadol, reboxetine, paracetamol, celecoxib, and naproxen); 3) drugs with preferential activity in MA, with no/partial efficacy in TH (duloxetine, pregabalin). Both carrageenan-induced MA and TH should be measured as they respond differently to pharmacological interventions.

EFIC5-0797

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

INHIBITION OF GLIAL ACTIVATION BY MINOCYCLINE MODIFIES THE EFFECTS OF BOTULINUM NEUROTOXIN A IN A MODEL OF NEUROPATHIC PAIN

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Background and aims: Botulinum neurotoxin serotype A (BoNT/A) shows long-lasting antinociceptive action in neuropathic pain models and its clinical application in pain therapy is continuously increasing. Our study aimed to examine the BoNT/A-induced effects in rats subjected to chronic constriction injury (CCI) to the sciatic nerve, after attenuation of glia activation by minocycline.

Method: The experiments were carried out according to IASP recommendations and local Bioethics Committee. The CCI of the sciatic nerve was performed in Wistar rats. Minocycline was injected intraperitoneally and BoNT/A intraplantarly. Behavioral studies consisted of the allodynia and hyperalgesia measurement, biochemical studies comprised the RT-PCR analysis in the spinal cords and DRGs.

Results: A single intraplantar injection of BoNT/A induced long-lasting analgesic effect in neuropathic rats and diminished the injury-induced ipsilateral upregulation of C1q (microglial marker) and SNAP-25 mRNA in the spinal cord, independently from glia silencing by minocycline. On the contrary, it up-regulated C1q, GFAP and prodynorphin expression in DRG, previously decreased by minocycline.

Conclusions: We have shown that BoNT/A-induced analgesia is dependent on glia activity and that, in case of earlier minocycline administration, BoNT/A-induced biochemical changes are modified. BoNT/A increases the expression of prodynorphin and of both glia markers, effects that may be important for the side effects caused by this neurotoxin.

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DESCRIPTION OF MECHANICAL NOCICEPTIVE TESTING ON HIND LEGS AND TAILS OF PIGS

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Background and aims

This report comprises two experiments aimed at gaining methodological knowledge about quantification of mechanical nociceptive thresholds in pigs stimulated at hindlegs and tails.

Methods

Twenty-eight castrated male (Exp1), and 24 (castrated males or females) (Exp2) pigs were used, weighing 50-60 kg, 16 weeks of age and housed in standard pens (4.40 x 4.40m) with *ad libitum* access to water and feed.

Mechanical nociceptive testing (4 stimulations/pig) was done by an electronic von Frey anesthesiometer (IITC, CA) with a rigid, hollow plastic tip (cut-off: 1000gf) and an area of 0.3mm². Exp1 targeted caudal metatarsus while the pigs were restrained in a cage. In Exp2, pigs were tested in an arena and stimulated on the dorsal tail surface, 10-15 cm from the root, while the tail was placed inside a PVC tube of 11x4.5cm with a top opening.

Results

In Exp1, 9% of stimulations had to be repeated because of spontaneous movements. For 23% of stimulations, data were censored. Median nociceptive threshold was 584gf (389-813) and no significant difference was found between single stimuli ($P=0.85$).

In Exp2, all animals responded to stimuli applied to the tail within the limit. Median nociceptive threshold was 313gf (260-462) and no significant difference was found between single stimuli ($P=0.23$).

Conclusions

This investigation provides information towards characterization of porcine cutaneous sensitivity through evaluation of differences in behavioural endpoints and nociceptive thresholds recorded at distinct anatomical regions. Further studies are needed to appraise the influence of the different experimental variables involved.

EFIC5-0977

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

ENVIRONMENTAL FACTORS AND PELVIC PAIN: FROM BEDSIDE TO BENCH

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Background and Aims: Chronic pelvic pain is a debilitating problem that can significantly impair the quality of life of women. The biopsychosocial model suggests that biological, psychological and social factors play a role in chronic pain. In 1947 Hebb first explored the long-term benefits of an enriched environment in experimental animal studies. Environmental enrichment includes both social and physical stimulation and has been shown to be neuroprotective in a variety of neurodegenerative disorders in animal studies. We have previously developed a rodent model of inflammatory pelvic pain (Wesselmann et al., Pain, 73, 1997). The aim of the present study was to assess the impact of environmental enrichment on pain behavior in this model.

Methods: Female rats were housed in an enriched environment starting at 3 weeks of age (n=6). Control rats were housed in standard cages (n=5). Sixty days later mustard oil was injected into one uterine horn in rats to produce inflammation. Non-stop videotape recording was performed for 5 days to monitor rat behavior.

Results: Rats with uterine inflammation showed behavior during the first 5 days post-inflammation suggestive of visceral pain. Exposure to an enriched environment resulted in a significant reduction ($P<0.01$) of visceral pain behavior.

Conclusions: These results demonstrate that environmental enrichment leads to a significant reduction in visceral pain behavior in this rodent model of pelvic pain, suggesting that environmental factors early in life could play an important role in the development of chronic pelvic pain at later in life.

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EFFECT OF E-52862 ON NEUROPATHY SIGNS INDUCED BY TREATMENT WITH VINCRISTINE IN RATS

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Aim of Investigation: Vincristine is an antineoplastic drug that induces peripheral neuropathies in humans and rodents (Eur J Pharmacol 2010, 648:102-9). E-52862 is a new selective sigma 1 receptor (σ 1R) antagonist (S1RA, 4-[2-[[5-methyl-1-(2-naphthalenyl)-1H-pyrazol-3-yl]oxy]ethyl]morpholine) showing an interesting antinociceptive profile in nociceptive and neuropathic pain models (Br J Pharmacol 2012, 166:2289-306). Our aim was to test if the blockade of the σ 1R might prevent the development of signs of vincristine-induced neuropathy in rats.

Methods: Male Wistar rats were treated with vincristine (0.1 mg/kg ip) or saline solution or vincristine + E-52862 (0.1+50 mg/kg ip, respectively) in two 5-days cycles (Pain 2003, 103:131-8). Mechanical (von Frey) and cold (acetone) allodynia, and mechanical (rodent pincher) hyperalgesia, were tested before and during treatments. At the end of the experiment the axonal peripheral activity of A delta-fibers was analyzed (Neurosci Lett 1986, 66:141-6)

Results: Animals injected with vincristine developed signs of peripheral neuropathy from the second day of treatment. Co-administration of E-52862 with vincristine prevented the development of mechanical and thermal hypersensitivity. The A delta-fibers of vincristine-treated rats showed spontaneous discharges, reduced mechanical thresholds and increased responses to mechanical stimulation. The axonal peripheral activity recorded in rats treated with E-52862 + vincristine was similar to that recorded in saline solution treated group

Conclusions: Chronic treatment with vincristine developed behavioural and electrophysiological signs of neuropathy in rats. The co-administration of E-52862 fully prevented the development of these signs. Thus, the blockade of the σ 1R may be a new therapeutic strategy to prevent the development of vincristine-induced neuropathy.

ASSESSMENT OF THE EFFECTS OF ARRABIDAE CHICA VERLOT. EXTRACT IN EXPERIMENTAL MODEL OF OSTEARTHRTIS INDUCED RATS

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The pain and limitation of motion and inflammation are features of osteoarthritis (OA).

OBJECTIVE: Evaluate the effects of Arrabidae chica Verlot extract (LCA) orally in experimental model of osteoarthritis induced rats. Lesion was induced by a single intra articular injection of sodium monoiodoacetate (MIA) in the right knee of animals in the saline and OA- saline -OA- Herbal group, while in the third group (no OA) has not induced OA. The animals of the OA- Herbal group received treatment from the 7th day after induction by the end of the experiment (28 days) with the herbal extract at a dose of 50 mg / kg, while the OA-Salina group received the same volume of NaCl 0.9%. The animals were evaluated for behavioral signs of chronic pain on days 0, 5, 14, 21, 28 after induction of OA on Von Frey test, Randall Sellito test, Weight Bearing test and Rota Rod test. On day 28 of the experiment the animals were euthanized to collect the synovial membrane for histopathological analysis and radiography of the knees of all animals.

RESULTS: Five days after injection, MIA induced allodynia and mechanical hyperalgesia, where the herbal reduced the intensity of allodynia and mechanical hyperalgesia from 14th day until the 28th day of the experiment. Furthermore, from the 14th day the LCA attenuated deficit in the weight distribution of the hind paws of animals and significantly improved the forced ambulation. The LCA improved extract of chronic pain behaviors in the experimental model of OA in rat.

EFIC5-1038

Basic Science (Anatomy/physiology/pharmacology/behaviour): Animal pain models

EVALUATION OF THE NON-CLINICAL ACTION OF ALPHA-LIPOIC ACID AND NEFOPAM ON PERIPHERAL NEUROPATHY INDUCED BY PACLITAXEL IN RATS

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Background and aims

Peripheral sensory neuropathy is the most commonly reported neurotoxic effect of paclitaxel and it limits the treatment. Various attempts have been made to prevent chemotherapy-induced neuropathy with possible neuroprotective agents. We aimed to investigate the efficacy of the alpha-lipoic acid and nefopam in an animal model of neuropathic pain induced by paclitaxel.

Methods

Neuropathy was induced in male Wistar rats by administration of 2 mg/kg paclitaxel, once daily, for 4 days. The tested drugs were administered concomitantly with paclitaxel alpha-lipoic acid (100 mg/kg, p.o.) nefopam (15 and 30 mg/kg, i.p.). Assessment of tactile allodynia and mechanical hyperalgesia was performed right before and at 4, 10 and 18 days after administration of paclitaxel by measuring mechanical-induced sensitivity to pain with Dynamic Plantar Aesthesiometer and von Frey filaments.

Results

Paclitaxel-induced neuropathy was intense, both after the administration of four consecutive doses, but also after interrupting the administration. Alpha-lipoic acid decreased statistically significant the tactile allodynia and mechanical hyperalgesia induced by paclitaxel. Repeated 18 days administration of nefopam (15 and 30 mg/kg, once per day, i.p.) significantly reduced paclitaxel-induced mechanical hyperalgesia. The combination of alpha-lipoic acid with nefopam, led to the maximum analgesic effect throughout the study.

Conclusions

The combination of alpha-lipoic acid (an antioxidant substance) with nefopam (an analgesic drug) used in the experiment showed therapeutic potential in the fight against neuropathic pain induced by the administration of the taxanes.

ANTINOCICEPTIVE EFFECT OF REPEATED MOTOR CORTEX STIMULATION (MCS) IN A RAT MODEL OF FIBROMYALGIA

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Background and Aims: Fibromyalgia is a dysfunctional pain syndrome characterized by chronic widespread pain, psychiatric comorbidities as well as non-painful sensory alterations. Without specific treatment, fibromyalgic patients are usually refractory to pharmacologic therapy. Thus, neuromodulatory approaches like TMS and MCS emerge as a promising alternative for its treatment. A recently proposed animal model based in the pharmacological depletion of monoamines rises as important tool to understand Fibromyalgia and its potential treatment. This work is intended to evaluate the antinociceptive effect of repeated MCS in rats submitted to Fibromyalgia model.

Methods: Monoaminergic depletion was induced by reserpine administration for three consecutive days (2mg/kg, s.c.). Mechanical allodynia and hyperalgesia were measured with VonFrey filaments and pin prick test, respectively. Epidural electrodes were implanted in the motor cortex area representative to the left hind paw. MCS session (15 minutes – 1.0 V, 60 Hz, 210 μ s) was performed once a day, from the 3rd to the 7th day after the induction. Nociceptive behavior was evaluated before (Basal), 3 and 7 days after induction.

Results: Reserpine induced mechanical hypersensitivity, as observed by the decrease of mechanical threshold assessed by VonFrey filaments (A) and by the increase in time spent with nocifensive behavior assessed in Pin Prick test (B). After 5 sessions of MCS, hypersensitivity was reversed in groups submitted to monoamine depletion. Interestingly, it was observed a shift in mechanical threshold in the control group after 5 sessions of MCS.

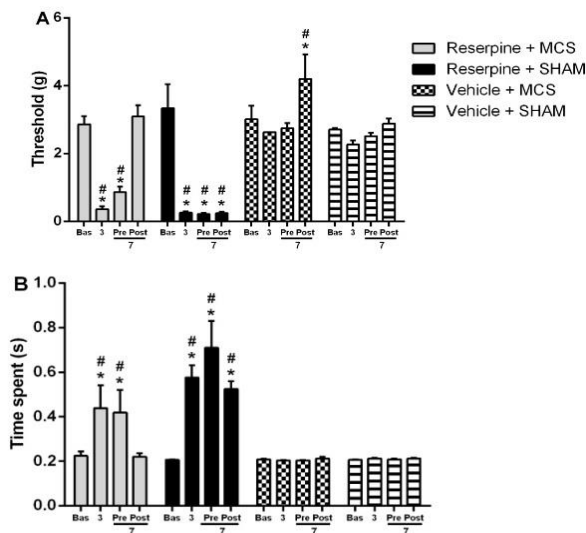


Figure 1: Effect of repeated MCS on mechanical allodynia (A) and hyperalgesia (B). (two-way ANOVA, followed by Bonferroni, *p < 0.05 compared to Basal; #p < 0.05 compared to Vehicle + SHAM).

Conclusions: Repeated administration of MCS displays mechanical antinociception in an experimental model of Fibromyalgia.

EFFECTS OF IBUPROFEN AND MINOCYCLINE TREATMENT ON THERMAL HYPERALGESIA IN BALB-C MICE AFTER SPINAL CORD CONTUSION

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Background and aims: Ibuprofen and minocycline are two drugs that alleviate pain after chronic constriction injury. The aim of present study is to evaluate the effects of both drugs on thermal hyperalgesia in mice subjected to a spinal cord contusion.

Methods: Female adult Balb-c mice were subjected to dorsal laminectomy at T8-T9 vertebrae and the exposed spinal cord was injured using the weight-drop technique (2 gr; 25 mm). Animals were treated with Ibuprofen (IBU; 50 mg/kg; i.p.) and Minocycline (MIN; 50 mg/kg; i.p.) diluted in saline solution. Control animals received saline solution. All drugs were administered daily during the first week post-surgery. At 7 and 14 days post-operation (dpo) thermal hyperalgesia (withdrawal latency) was evaluated using the plantar test. Then, animals were perfused and the spinal cord processed by immunohistochemical techniques for GFAP, CGRP, and IB4, and by Western-Blot for p38-MAPK and NF-kappaB expression.

Results: At 14 dpo, the withdrawal latency, the immunoreactivity to astrocytes (GFAP) and the staining to afferent nociceptive fibers in dorsal horn (CGRP, IB4) were similar in all experimental groups studied. Slightly reduction of p38-MAPK and NF-kappa-B expression were seen in MIN and IBU groups, respectively to control mice.

Conclusions: Under our experimental conditions, at 14 dpo IBU and MIN treatments does not alleviate thermal hyperalgesia with respect control animals. No changes in GFAP, CGRP and IB4 staining were observed between treated and control mice, but a slightly lower expression of p38-MAPK and NF-kappaB was seen in treated mice.

EFIC5-0632

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

MU-OPIOID RECEPTORS OF LOCUS COERULEUS PLAY AN ESSENTIAL ROLE IN THE MORPHINE WITHDRAWAL SYNDROME IN NEUROPATHIC PAIN

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Background and aims: The use of opioids for chronic pain treatment is limited due to the high doses required, which lead to tolerance and dependence states mediated by mu-opioid receptors (MOR). The Locus Coereuleus (LC), an area with high MOR expression, is involved in neuropathic pain and opioid physical dependence. Thus, we have evaluated, in a neuropathic pain model, (i) the MOR functionality of LC neurons before and after morphine chronic treatment and (ii) physical signs after naloxone-precipitated morphine withdrawal.

Methods: Chronic constriction injury (CCI) of rat sciatic nerve was used as neuropathic pain model at 7 and 28 days after surgery. Experimental groups were: untreated (sham, CCI7d, CCI28d) and chronic morphine-treated (sham-morphine, CCI7d-morphine, CCI28d-morphine). Behavioural, electrophysiological, immunohistochemical and western blot assays were performed.

Results: CCI animals developed allodynia and hyperalgesia. Morphine dose-response curve was shifted to the left in CCI28d compared to sham and CCI7d untreated groups, accompanied by an increase in MOR, pCreb, cFos expression in the LC. Besides the expected analgesic effect, chronic morphine treatment decreased the firing rate in CCI28d. After naloxone-precipitated morphine withdrawal, the increase of electrical activity was less pronounced in CCI7d-morphine and CCI28d-morphine comparing with sham-morphine. Additionally, physical signs and cFos overexpression were significantly attenuated in CCI28d-morphine respect to sham-morphine.

Conclusions: These findings indicated that MOR activity in the LC is modified by long-term neuropathic pain. This could explain the smaller development of withdrawal state in chronic treatment with opioids in neuropathic pain.

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EFIC5-0636

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

DEPRESSION AND ANXIETY INDUCED BY CHRONIC PAIN ARE ASSOCIATED WITH IMPAIRED LOCUS COERULEUS ACTIVITY

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Background and aims: Depression and anxiety may emerge as a consequence of severe painful conditions having repercussions on patient's psychological state and potentiating the negative effects of chronic pain. However, the mechanisms underlying the association of pain to the development of anxiety and depression are barely known. The Locus coeruleus (LC) is an important candidate that orchestrates the neuronal circuitries behind chronic pain and has an exceptional role in the regulation of anxiety and depression disorders.

Methods: Monoarthritis was induced by complete Freund's adjuvant injection as a model of inflammatory pain. We evaluated the behavioral attributes of pain, depression and anxiety, and the LC function by electrophysiology, at distinct time-points of the monoarthritis. Next, we quantified protein expression by western blot and immunohistochemistry.

Results: We observed a late-phase activation of extracellular-signal regulated kinases1/2 (pERK1/2) in monoarthritis, accompanied by anxiety and depressive behaviors that were reverted by topical anti-inflammatory therapy. Also, the electrophysiological activity of LC neurons was altered during chronic monoarthritis. ERK1/2 inhibitor administration in the LC of monoarthritic rats resulted in a reversion of the anxiety behavior, recovery of electrophysiological basal values and normalization of pERK1/2 levels in the prefrontal cortex. Additionally, using a corticotropin-releasing factor (CRF) antagonist, which blocks endogenous CRF activity, pERK1/2 levels and anxiety-like behavior in chronic inflammation were reduced without altering the nociceptive behavior.

Conclusion: The LC is involved in the increased perception to noxious stimuli and the emergence of pain-related anxiety. CRF may act as precursor in these ERK1/2-mediated events. CIBERSAM; FIS(PI13/02659, PI12/00915).

EFIC5-0789

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

STIMULATING THE OPERCULO-INSULAR CORTEX FOR PAIN MODULATION: CROSSED EVIDENCE FROM TDCS AND INTRA-CRANIAL STIMULATION

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Motor cortex stimulation for pain relief has shown its usefulness but also its limits. In the search for new targets, one can stimulate relatively high (e.g. DLPFC) or low level cortical areas. The posterior insula-medial operculum is one of the earliest areas to process nociceptive information and plays a major role in pain perception. However, given its anatomy and deep location in the brain, it is difficult to target. We addressed operculo-insular stimulation along four experimental lines: animal models, TMS, tDCS and intra-cranial stimulation; here we present the two latter.

Methods: (a) 10 epileptic patients, implanted with intra-cranial electrodes, received high-frequency stimulation at operculo-insular contacts that evoked somesthetic sensations. 10 supra-threshold peripheral painful electrical stimuli were delivered before, during and after low-frequency cortical stimulation between two neighboring contacts.

(b) A multi-polar tDCS montage was used to deliver anodal and cathodal stimulation to the right operculum-insula of 10 healthy participants, in a double-blind cross-over design. Subjective pain threshold and tolerance to a Cold Pressor Test, as well as vegetative responses and EEG were recorded and compared before, during and after the application of tDCS.

Results: (a) Neither perception nor intracranially-recorded evoked potentials to a nociceptive stimulus were significantly altered by low-frequency, low-intensity intracranial stimulation of operculum-insula, in 10 epileptic patients.

(b) Multi-polar tDCS was well tolerated by all participants. While pain thresholds were not significantly modulated, there was a differential effect of tDCS polarity on pain tolerance, with cathodal stimulation leading to faster hand withdrawal.

Work carries on!

EFIC5-0834

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

ORBITOFRONTAL ENCODING OF RISK PREFERENCE IN A RODENT GAMBLING TASK OF DECISION-MAKING IS MODULATED BY DOPAMINE D2/D3 RECEPTORS

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Background and aims

It has been recently described that chronic pain patients and animal models of pain present disrupted risk assessment in emotion-based decision tasks under ambiguity such as the Iowa Gambling Task or the Rodent Gambling Task (RGT). In this study, we investigated whether the pharmacological modulation of D2r receptors activity alters pain-related abnormal risk-assessment and OFC neural representation during performance in the RGT probe session of decision-making under ambiguity.

Methods

The RGT is a two-lever free choice task in which naïve animals are exposed to new and uncertain reward probabilities associated with a low risk (1 food pellet at 0.9 chance) and a high risk lever (3 food pellets, 0.3 chance). Our previous studies have shown that control animals prefer the low-risk lever, while OFC-lesioned or animal models of pain prefer the high risk lever.

Results

We recorded the neural activity from 320 OFC neurons in awake freely moving rats, during performance in the RGT. We compared the behavioral performance and neurophysiological activity profile after the systemic or intra-OFC administration of either saline, D2/D3r agonist quinpirole (0.05 mg/ml) or D2/D3 antagonist raclopride (0.05 mg/ml). Our results show that both drugs disrupt normal performance in control animals, but systemic raclopride restores preference for the low risk lever in CFA animals.

Conclusions

Systemic and OFC modulation of D2/D3r is able to restore normal risk preference and decision-making in chronic pain animals.

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EFIC5-0835

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

ALTERED EXPRESSION OF DOPAMINE RECEPTORS IN HIPPOCAMPUS PARALELS THE REDUCTION IN HIPPOCAMPUS FUNCTIONAL CONNECTIVITY IN NEUROPATHIC RATS

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Background and aims

Despite all the knowledge gathered in recent years, it remains unclear if chronic pain affects the hippocampal dopaminergic transmission and if that translates to a disruption of the information processing needed for spatial mnemonic processing. In this study we examined whether activation of dopamine D2/D3 receptors during performance in a spatial alternation working memory task affects hippocampus dorsoventral functional connectivity.

Methods

To address this issue, we implanted multichannel arrays of electrodes in the dorsal and ventral hippocampal CA1 region of rats and recorded the neuronal activity during a food-reinforced spatial working memory task of trajectory alternation. Within-subject behavioral performance and patterns of dorsoventral neuronal activity were assessed before and after the onset of persistent neuropathic pain using the Spared Nerve Injury (SNI) model of neuropathic pain.

Results

Our results show that the peripheral nerve lesion caused a disruption in working memory and in hippocampus spike activity; in parallel we observed changes in the gene expression of dopamine receptors and modulators (D1, D2, D3, TH, MAO). The behavioral disruption was reversed by the systemic administration of the dopamine D2/D3 receptor agonist quinpirole (0.05 mg/kg). In SNI animals the administration of quinpirole restored performance and spike activity to the normal range characteristic of naïve animals, while quinpirole in sham animals caused the opposite effect.

Conclusions

These results suggest that disruption of the dopaminergic balance in the hippocampus may be crucial for the clinical neurological and cognitive deficits observed in patients with painful syndromes.

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EFIC5-0856

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

USING ELECTROENCEPHALOGRAPHY AND TRANSCRANIAL MAGNETIC STIMULATION TO BETTER UNDERSTAND THE INTERACTION BETWEEN PAIN AND THE MOTOR SYSTEM

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Background and aims: The interaction between pain and the motor system is well-known in clinic. The aim of the present study was to better understand the cortical mechanisms underlying this interaction.

Methods: Nineteen healthy adults participated in the study. The effect of pain (induced by a capsaicin cream) on brain activity and on the corticomotor system was assessed with electroencephalography (EEG) and transcranial magnetic stimulation (TMS), respectively. For EEG, 15 non-overlapping, 2-seconds artifacts were randomly selected for each participant. Intracranial source current density was then computed with a resolution of 1 Hz, and functional connectivity among a posterior identified brain nodes was determined using sLORETA software.

Results: When participants experienced experimentally-induced inflammatory pain, their resting state brain activity increased significantly across the central cuneus (theta frequency), the left dorsolateral prefrontal cortex (alpha frequency), and both the left cuneus and right insula (beta frequency; all $t_s > 3.66$; all $p_s < 0.01$). A pain-evoked increase in the right primary motor cortex activity was also observed (beta frequency), but only among participants who showed a simultaneous shrinking of their motor cortex representation (quantified using the recruitment curve obtained with TMS; $t=4.45$, $p<0.05$). These participants further showed greater beta motor-cuneus connectivity than participants for whom pain did not affect motor cortex somatotopy ($t=3.58$, $p<0.05$).

Conclusions: These results suggest that pain-evoked increases in primary motor cortex beta power are intimately tied to alterations in cortical motor representation. Moreover, we provide evidence that beta motor-cuneus connectivity is related to the corticomotor alterations induced by pain.

EFIC5-0857

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

AGE INFLUENCES THE INTERACTION BETWEEN PAIN AND THE MOTOR SYSTEM: A TRANSCRANIAL MAGNETIC STUDY IN HEALTHY ADULTS

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Background and aims: Past studies have shown that acute experimental pain modulates the excitability of the motor system. The aim of the present study was to evaluate if these induced changes are affected by age.

Methods: Twenty healthy adults (mean age = 28 ± 6 years old) participated in the study. Corticomotor excitability was assessed by monitoring the motor evoked potentials (MEP) of the first dorsal interosseous (FDI) before and after capsaicin application to the volar aspect of the non-dominant forearm. MEP were induced with a transcranial magnetic stimulation (TMS) apparatus (Magstim 200, Magstim Co. Dyfed, UK) connected to a figure-of-eight coil.

Results: Although pain had no significant effect on MEP amplitude as a whole ($p = 0.24$), we observed the presence of a significant and negative correlation between age and the change in MEP response ($r = -0.52$; $p = 0.02$). An independent sample t-test, comparing the pain-induced MEP responses between individuals aged 20-29 years old ($n = 12$) and individuals aged 30-39 years old ($n = 8$), revealed a significant group difference ($p = 0.04$), with the former group showing greater MEP change (increased excitability) than the latter group (no change in excitability).

Conclusion: The present results suggest that the effect of pain on corticomotor excitability is not uniform across ages, with young individuals being more 'affected' by pain than older individuals. Future research is necessary to validate these results on larger age-span groups and to better delineate the clinical implications of these results.

EFIC5-0879

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

NEUROINFLAMMATION AND SYNAPTIC DYSFUNCTION IN PREFRONTAL CORTEX IN HYPERALGESIC DIABETIC RATS

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Background and aims: Diabetes was shown to induce structural and functional changes at human central nervous system, affecting brain areas involved in pain perception, namely the prefrontal cortex (PFC). Considering the important role of PFC in emotional/cognitive pain processing, these changes may contribute to diabetic neuropathic pain (DNP). The mechanisms subserving these changes remain elusive. The knowledge of such mechanisms may bring new highlights for the development treatments for pain relief in DNP. This study aimed at evaluating inflammatory parameters and neuronal synaptic integrity in the PFC of hyperalgesic diabetic rats.

Methods: Rats were rendered diabetic by an intraperitoneal injection of (60 mg/kg bodyweight). Control animals received vehicle solution. Mechanical nociception was evaluated, prior to STZ/vehicle injection and at 10 weeks post-injection, using paw-pressure test. Afterwards the rats were sacrificed and PFC was immediately removed and processed by western blot for quantification of Iba1 (microglial activity marker), IL1 β and TNF α (pro-inflammatory factors) and synaptophysin (synaptic integrity marker).

Results: The STZ rats developed mechanical hyperalgesia and presented a significant increase in the expression of Iba1, along with augmented levels of IL1 β and TNF α in PFC, when compared with controls. The synaptophysin expression was significantly decreased in STZ rats when compared with controls.

Conclusion: Hyperalgesic diabetic rats presented neuroinflammation and altered synaptic integrity in the PFC. These changes may contribute to the structural and functional alterations detected in the PFC of diabetic patients and may concur for altered pain perception.

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EFIC5-0904

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

NEUROPATHIC PAIN INDUCES SPATIAL MEMORY IMPAIRMENT AND HIGH EXPRESSION OF CAMK II -THR305 AND PSD95 IN MEDIAL PREFRONTAL CORTEX IN RATS

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Objective: To evaluate the effect of neuropathic pain on spatial learning and memory and the expression of CaMK II phosphorylation and postsynaptic density protein 95 (PSD95) in medial prefrontal cortex (mPFC) in the rats.

Methods: 32 healthy male Wister rats were randomly divided into 4 groups: neuropathic pain group (NP group), NP model groups injected with saline or KN-93 in mPFC (NS, or KN-93 group) and sham operated group (SO group). The NP model was prepared by operation of chronic constriction injury of the sciatic nerve. Mechanical withdrawal threshold (MWT) and thermal withdrawal latency (TWL) were measured on 7th, 14th, 21st and 28th day after operation. 29th-35th day after operation eight-arm maze was used to detect spatial learning and memory. 33rd day after operation NS or KN-93 groups were prepared for detection in the spatial learning and memory on 35th day. After the test rats were killed immediately to measure the expression of PSD95 and CaMK II Phosphorylation sites Thr³⁰⁵ in mPFC by Western Blotting, RT-PCR and Immunofluorescence methods.

Results: Compared with SO group, the function of spatial learning and memory in NP group was declined, while the expression of PSD95 and CaMK II - Thr³⁰⁵ was increased ($P<0.05$). Compared with NS group, the function of spatial learning and memory in KN-93 group was improved ($P<0.05$), while the expression of PSD95 and CaMK II - Thr³⁰⁵ was reduced ($P<0.05$).

Conclusion: Neuropathic pain can induce spatial memory impairment and up-regulated the expression of PSD95 and CaMK II -Thr³⁰⁵ in medial prefrontal cortex in rats.

EFIC5-0932

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

ENDOCANNABINOID AND ENDOVANILLOID SYSTEMS INTERACT IN THE PRELIMBIC CORTEX TO CONTROL NEUROPATHIC PAIN INDUCED BY PERIPHERAL NERVE CHRONIC CONSTRICTION INJURY

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BACKGROUND AND AIMS

The anandamide (AEA) exerts biphasic effects on some emotions reactions into the central nervous system of rats. Considering the opposite functions for cannabinoid type 1 receptor and transient receptor potential vanilloid type-1 channel, we hypothesized that these receptors could differentially influence the activity of the prelimbic cortex (PL) during the neuropathic pain (NP) induced after 21 days of chronic constriction injury (CCI) of the *ischadicus nervus* by placing a loose ligature around the nerve, an adaptation of the Bennett and Xie's model in rodents.

METHODS

Male Wistar rats were used. NP was induced by CCI. A sham surgery control group was also performed. After 14 days of CCI or sham, it was implanted a guide cannula in PL. PL cortex-treatment with 200nL of AEA (5, 50 and 100pmol) and capsazepine at 100pmol plus AEA at 100pmol were performed 21 days after CCI or sham, followed by von Frey's test during 60 minutes.

RESULTUS

The PL cortex treatment with AEA at 5pmol did not alter the mechanical allodynia ($F_{(4,35)}=2.01$; $P>0.05$) while the AEA at 50pmol reduced the mechanical allodynia ($F_{(4,35)}=3.17$; $P<0.05$). The higher dose of AEA (at 100pmol) increased the mechanical threshold ($F_{(4,35)}=3.17$; $P<0.05$) whereas the PL-pretreatment with capsazepine (at 100pmol) plus AEA (at 100pmol) caused the decreasing of mechanical allodynia ($F_{(4,35)}=3.17$; $P<0.05$).

CONCLUSION

These findings suggest that an endogenous substance anandamide of the PL cortex can play a role in both attenuation and potentiation/maintenance of NP via its actions at CB₁ receptors and TRPV₁ channels, respectively.

CHEMICAL STIMULATION OF MOTOR CORTEX BY N-METHYL-D-ASPARTATE GLUTAMATERGIC SYSTEM ACTIVATION ATTENUATES THE NEUROPATHIC PAIN INDUCED BY THE CHRONIC CONSTRUCTION NERVE INJURY

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The motor cortex (MC) stimulation is effective as a therapy for patients with neuropathic pain (NP) in humans. It was demonstrated that cortical stimulation increases the nociceptive threshold of rats. However, the networks and pharmacological mechanisms underlying its analgesic effects are still unknown. In the present study, the effect of chemical stimulation though MC-treatment with NMDA agonist on NP in rats was investigated.

Male Wistar rats (n=7-11 per group) were used. NP was induced by chronic constriction injury of the sciadicus nerve (CCI: by placing a loose ligature around the nerve) or the sham surgery procedure was made. After 14 days, a guide cannula was unilaterally implanted into the MC through stereotaxic surgery. MC-treatment with 200nL of saline or NMDA agonist (2nmol) was performed 21 days after CCI or sham, followed by von Frey's test during 60 minutes.

The MC-treatment group with saline in rats with 21 days after CCI had their mechanical thresholds significantly reduced in comparison with MC-treatment group with saline in rats with 21 days after sham procedure ($F_{(3,30)}=31.80$; $P<0.05$). The chemical stimulation of MC with NMDA at 2nmol increased the mechanical allodynia in the von Frey test after 21 days after CCI, in other words, there was decreasing of NP ($F_{(3,30)}=29.66$; $P<0.05$).

Thus, the possible analgesic effect of MC stimulation may depend on glutamate NMDA receptors signalling and can involve long-term potentiation-like mechanisms. Further investigation of the mechanisms involved in this effect may contribute to the improvement of the clinical treatment of neuropathic pain.

PRELIMBIC CORTEX MODULATES THE DEPRESSION-ASSOCIATED BEHAVIOURS PRESUMABLY INDUCED BY NEUROPATHIC PAIN

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BACKGROUND AND AIMS: Depression is a common comorbidity of neuropathic pain (NP). Few preclinical studies focus on relief of comorbidities evoked by NP. In this study, we evaluated the depression-associated behaviours in a NP model in rats. We also investigated the involvement of prelimbic division (PL) of medial prefrontal cortex in rats subjected to chronic constriction injury of the *ischiodic nerve* (CCI) and submitted to the swimming forced test (SFT).

METHODS: 41 male Wistar rats (n=9-12 per group) weighing 100g were used. Stereotaxic surgery for implantation of a unilateral guide cannula aimed to the left PL cortex was performed 14 days after CCI. One week later, rats were pre-exposed to a 15 minutes session of forced swim. After 24 h, rats received an intracerebral injection of saline (0,2µl) or cobalt chloride (1mM/0,2µl) and were submitted to the forced swim test. Immediately after forced swim test, rats were submitted to the Von Frey's test. Control group were performed in sham operated animals, which were submitted to the same surgical procedures, without CCI.

RESULTS: CCI induced NP in all animals ($F_{(3,37)}=20.71$; $P<0.05$) as revealed by mechanical allodynia threshold. Treatment with cobalt chloride in rats with NP decreased frequency ($F_{3,37}=6.86$; $P<0.01$) and duration of immobility ($F_{3,37}=10.64$; $P<0.001$) in the forced swim test when compared to saline-treated NP animals ($F_{3,37}=6.86$; $P<0.05$).

CONCLUSION: These data suggest that depressive-like behaviours are observed in rats with chronic pain and that the cortex must be involved in the expression of such behaviours.

EFIC5-0954

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

POTENTIATION AND MAINTENANCE OF THE NEUROPATHIC PAIN BY ACTIVATION OF N-METHYL-D-ASPARTATE RECEPTORS OF THE PRELIMBIC MEDIAL PREFRONTAL CORTEX

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BACKGROUND AND AIMS

Neuropathic pain (NP) is a real challenge due to our limited understanding of the mechanisms that initiate and maintain chronic pain. The prelimbic division (PL) of the medial prefrontal cortex (MPFC) is important for the perception and modulation of acute and chronic pain. NP leads to neuronal rearrangement in the MPFC, presumably by an increase in the number of spines and glutamatergic neurotransmission. We investigate the involvement of the activation of NMDA receptors located in the PL cortex in NP induced by chronic constriction injury (CCI) of the *ischiodicus nervus* by placing a loose ligature around the nerve, an adaptation of the Bennett and Xie's model in rodents.

METHODS

Male Wistar rats (n=6-8 per group) were used. NP was induced by CCI. A sham surgery (right side) control group was also performed. After 14 days of CCI or sham procedure, a guide cannula was unilaterally implanted (left hemisphere) into the PL cortex through stereotaxic surgery. PL cortex-treatment with 200nL of NMDA agonist (at doses 0.25, 1 and 4nmol) was performed 21 days after CCI or sham procedure, followed by von Frey's test during 60 minutes.

RESULTS

The PL cortex pretreatment with NMDA at all doses (0.25, 1 and 4 nmol) increased the mechanical threshold in the von Frey test after 21 days of CCI ($P<0.05$).

CONCLUSION

These findings suggest that PL cortex is involved in the potentiation and maintenance of allodynia through activation of NMDA receptors in neuropathic pain rodents.

EFIC5-0956

Basic Science (Anatomy/physiology/pharmacology/behaviour): Brainstem, thalamus, and cortex

RODENTS WITH NEUROPATHIC PAIN UPON EXPOSURE TO SNAKE INCREASE THE ANXIETY/PANIC-LIKE BEHAVIOUR AND MECHANICAL ALLODYNIA

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BACKGROUND AND AIMS: Alterations of nociceptive threshold has been shown to be elicited in response to cues emanating from rodent natural predators. Anxiety/panic is a common comorbidity of neuropathic pain (NP). However, the pathogenesis of pain-related anxiety and the mechanisms underlying pain-related emotional/cognitive behaviour are mainly unknown. To investigate if the confrontation between prey versus predator contributes to the worsening of anxiety or pain, an animal model of snake-induced panic attack was used in neuropathic rats.

METHODS: Male Wistar rats (n=6-8 per group) and constrictor snakes (*Epicrates cenchria crassus*) were used. Neuropathy was induced by chronic constriction injury (CCI) of the ischiadicus nervus. Sham surgery (right side) animals were used as a control group. The prey versus predator confrontation was performed during 8 minutes. After confrontation with snakes, each rat was subjected to nociceptive threshold recording for 30 min, evaluated through von Frey's test.

RESULTS: After 21 days of CCI, the confrontation between snakes and rodents caused increase in instinctive fear-related responses ($P<0.01$). Furthermore, the neuropathic rats when confronted with snakes had their mechanical allodynia thresholds increased ($P<0.05$).

CONCLUSION: The rats displayed anxiety-related and panic-like defensive behaviours in the presence of constrictor snakes and evoked increase in mechanical allodynia. Thus, it was showed the potentiation and maintenance of comorbidity anxiety/panic and neuropathic pain in rodents.

THE INDIRECT PATHWAY OF THE NUCLEUS ACCUMBENS SHELL AMPLIFIES CHRONIC PAIN*W. Ren¹, S. Berger¹, M. Centeno¹, Y. Wu², X. Na², X. Liu², A. Apkarian¹, M. Martina¹, D. Surmeier¹*¹Physiology, Northwestern University, Chicago, USA²Physiology, Sun Yat-Sen University, Guangzhou, China

The forebrain limbic circuitry has long been hypothesized to play a critical role in the representation of pain, and the medial shell of the nucleus accumbens (msNAc) is a key node in this circuitry. msNAc has two parallel, opposing networks charged with affective evaluation of salient events. The direct pathway, which is linked to reward and positive affect, is anchored by spiny projection neurons (dSPNs) whose activity is enhanced by dopamine (DA) acting at D1 DA receptors. The indirect pathway, which is linked to aversion and negative affect, is anchored by spiny projection neurons (iSPNs) whose activity is suppressed by DA acting at D2 DA receptors. To investigate how these two networks respond to chronic pain, the adaptations in msNAc neurons were examined in a rodent peripheral nerve injury (SNI) model of chronic pain. Injury selectively increased excitability of msNAc iSPNs with fewer dendrites and hypo-dopaminergic states in NAc. Furthermore, combining systemic administration of L-DOPA and naproxen prevented the physiological and anatomical adaptations seen in iSPNs, blocked the development of tactile allodynia and blunted SNI-accompanied social recognition deficits. Surprisingly, chemogenetic activation of msNAc iSPNs led to a significant exacerbation of tactile allodynia. Our data suggested that iSPNs drive descending segmental pathways that enhance the reactivity of segmental circuitry controlling withdrawal reflexes. Moreover, we showed that the adaptations in msNAc iSPNs can be effectively blunted with a simple, well-tolerated treatment: L-DOPA in combination with naproxen, pointing to a novel therapeutic approach to managing, or preventing development of, chronic pain in humans.

Figure 1 - Ren et al.

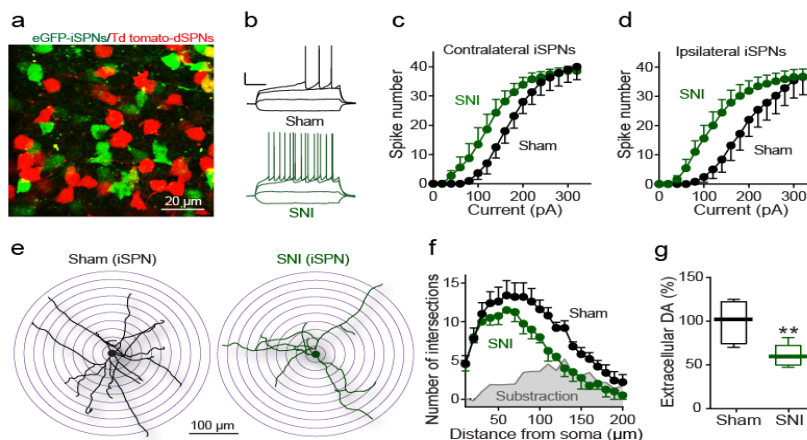


Figure 1. SNI induces iSPNs reorganization in msNAc.

a, Identification of iSPNs (eGFP-green) and dSPNs (Td tomato- red) in BAC mice.
 b-d, In SNI slices, intrinsic iSPN excitability is augmented bilaterally (calibration: 20 mV, 200 ms).
 e-f, SNI iSPNs have less complex dendritic trees and reduced total dendritic length.
 g, SNI animals have decreased dopamine level (% of pre-surgery) in NAc.

Figure 2 - Ren et al.

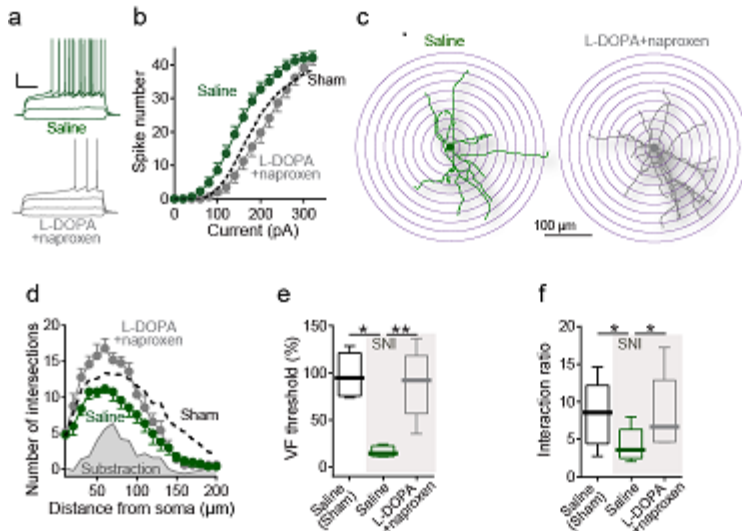


Figure 2. L-DOPA and naproxen combined treatment prevents SNI-induced reorganization of iSPNs and blunts tactile allodynia.

a-d, In SNI animals, combined treatment restores the physiological adaptations (a,b) and dendritic complexity (c,d) of iSPNs to sham level.
e-f, Combined treatment blocks tactile allodynia in SNI and reverses SNI-induced social ability impairment.

Figure 3 - Ren et al.

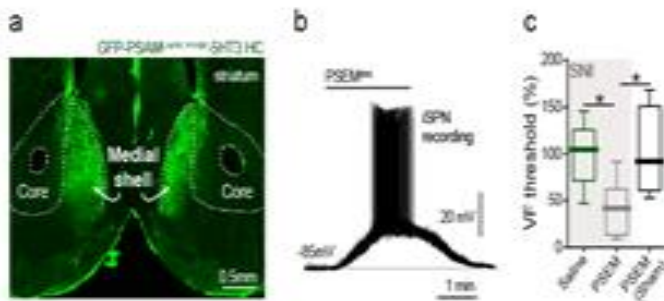


Figure 3. Activation of NAc shell iSPNs worsens pain behavior in SNI animals.

a, In AAV-PSAM^{141F,Y1115F-5HT3 HC-GFP} transduced A2a Cre mice, GFP fluorescence is exclusively expressed in NAc shell.
b, PSEM89S elicits rapid depolarization and spiking in GFP-positive iSPN.
c, Intraperitoneal injection of PSEM89S (30 mg/kg) worsens tactile allodynia in SNI animals.

VITAMIN C DEFICIENCY AGGRAVATES HYDROGEN SULFIDE-INDUCED PAIN/HYPERALGESIA AND CHEMOTHERAPY-INDUCED NEUROPATHY IN MICE: POSSIBLE INVOLVEMENT OF T-TYPE CALCIUM CHANNELS

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Background and aims: Blood vitamin C (ascorbic acid; AA) levels may be negatively correlated with the severity of neuropathic pain in humans. AA inhibits Ca_v3.2 T-type calcium channels (T-channels) in the nociceptors, thereby relieving neuropathic pain in rodents. Given that rodents, but not primates, are capable of synthesizing AA, we used mice lacking senescence marker protein 30/gluconolactonase (SMP30/GNL) essential for AA biosynthesis, and determined the effect of AA deficiency on the pain/hyperalgesia caused by H₂S that enhances Ca_v3.2 function and on paclitaxel-induced neuropathy.

Methods: SMP30/GNL-knockout (KO) or wild-type (WT) mice were fed with AA-deficient food and had free access to water supplemented with sufficient AA (1.5 g/L) [AA(+)] or minimum AA (0.0375 g/L) [AA(-)]. Nociceptive threshold in the hindpaw and referred hyperalgesia accompanying colonic pain were evaluated by von Frey test. AA levels were measured by the HPLC-ECD method.

Results: AA levels in the hindpaw and colon dramatically decreased when fed with AA(-) diet in KO, but not in WT, mice. In both WT and KO mice, intraplantar and intracolonic administration of NaHS, an H₂S donor, caused T-channel-dependent hyperalgesia and visceral nociceptive behavior accompanied by referred hyperalgesia, respectively. The pronociceptive effects of NaHS in KO, but not WT, mice, significantly increased when fed with AA(-) diet. In KO, but not WT, mice, AA(-) diet significantly aggravated paclitaxel-induced neuropathic pain, an effect reversed by T-channel inhibitors.

Conclusions: Our data thus suggest that AA deficiency aggravates H₂S-induced pain/hyperalgesia and chemotherapy-induced neuropathy most probably through the enhancement of T-channel activity.

EFIC5-0467

Basic Science (Anatomy/physiology/pharmacology/behaviour): Ion channels

USING HIGH-THROUGHPUT ELECTROPHYSIOLOGY TO STUDY SODIUM CHANNEL MUTATIONS ASSOCIATED WITH RARE INHERITED PAIN DISORDERS

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Background and aims:

Erythromelalgia (EM) is a pain disorder characterised by severe burning pain sensations in the extremities. Its inherited form was the first autosomal dominant disorder in which mutations in the SCN9A gene, encoding the alpha subunit of the Nav1.7 sodium channel, were associated with a chronic pain condition. When expressed *in vitro*, these gain-of-function mutations have been shown to alter channel biophysics and/or mediate neuronal hyperexcitability. Some EM patients respond to sodium channel blockers, supporting the hypothesis that pharmacogenomics could guide the identification of future patient populations and efficacious therapies. The aim of this study was to implement assays on a high-throughput electrophysiology platform (QPatch16x, Sophion Bioscience) to: (1) profile the biophysics of the mutated channels, and (2) increase the throughput of pharmacological assessment of SCN9A polymorphisms and mutations.

Methods:

Using the QPatch and stable cell lines transfected with a single Nav1.7 mutation, we mapped the effects of clinically available sodium channel blockers and novel Nav1.7 selective blockers on biophysical parameters as well as investigating the compounds' pharmacological characteristics.

Results:

Our results show that biophysical and pharmacological profiles of SCN9A mutations can be resolved and studied on the QPatch. We assessed a library of sodium channel blockers, using a series of different assays. There was an overall good correlation with the data obtained with conventional manual patch-clamp.

Conclusions:

A high-throughput electrophysiology platform can be utilised for a systematic pharmacogenomics approach to provide guidance for identification of effective treatments for these chronic pain disorders.

APOA-I-MIMETIC PEPTIDE AND E06 MONOCLONAL ANTIBODY AS NEW THERAPEUTICS IN OXPAPC-INDUCED INFLAMMATION AND HYPERALGESIA MEDIATED VIA TRPA1

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Background and aims: During inflammation reactive oxygen species oxidize 1-palmitoyl-2-arachidonoyl-sn-glycero-3-phosphocholin (PAPC), an ubiquitous phospholipid in plasma membranes. Oxidized lipids can activate transient receptor potential (TRP) channel ankyrin 1 (A1). D-4F, a mimetic peptide of structural protein ApoA-I of high density lipoproteins, binds OxPAPC and reduces plaque lesions in atherosclerosis. Similarly, E06 monoclonal antibody from ApoE-deficient mice neutralizes OxPAPC. Here, we investigated whether OxPAPC is a target in inflammatory pain. Clinical phase II studies have proven good tolerance of D-4F in humans. We hypothesize that D-4F and E06 block OxPAPC-induced TRPA1 activation and hyperalgesia.

Methods: Mechanical hyperalgesia was measured after local treatment with OxPAPC, complete Freund's Adjuvans (CFA) or collagen-induced arthritis (CIA) by Randall-Selitto or von Frey test. Oxidized phospholipids (OxPL) were measured by MALDI TOF. In Fura-2/AM-based calcium imaging experiments on murine DRGs or HEK_{TRPA1} cells, TRPA1-activation as well as inhibitory effects of D-4F and E06 were evaluated.

Results: *In vitro*, OxPAPC elicited activation of TRPA1 in dorsal root ganglia (DRGs) or HEK_{TRPA1}. The number of activated cells after co-incubation of OxPAPC with D-4F or E06 decreased significantly. Local injection of OxPAPC as well as CFA *in vivo* induced formation of OxPL in MALDI-TOF and led to mechanical hyperalgesia in rats. E06 and D-4F blocked OxPAPC-, CFA and CIA-induced inflammation and mechanical hyperalgesia.

Conclusion: OxPAPC evoked mechanical hyperalgesia in rats via TRPA1. Inhibitory effects of D-4F and E06 mAb on OxPAPC-induced hyperalgesia lead to new strategies in treatment of inflammatory pain in patients.

Acknowledgement: IZFK Würzburg, Germany supported the project.

P2RX7 GENETICS AT THE CROSSROADS OF NEUROIMMUNE INTERACTIONS

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Background and aims

P2RX7 encodes a purinergic receptor with a role in the pro-inflammatory response. Notably it has also been implicated in chronic pain. A highly polymorphic gene, it is an attractive target for genetic association studies, especially given the dichotomy between its hypo- and hyperactive variants. Under the hypothesis that an upregulated *P2X7* will increase both immune system vigilance and susceptibility to chronic pain, we query its genetic landscape and functional consequences of changes thereto, hoping to elucidate its role in pain against the backdrop of neuroimmune interactions.

Methods

We genotyped all missense *P2RX7* SNPs with MAF ≥ 0.01 in a cohort of 1,082 chronic cases of temporomandibular disorder (TMD) and 2,144 TMD-free controls in the OPPERA (Orofacial Pain: Prospective Evaluation and Risk Assessment) project. Both groups underwent clinical examination and quantitative sensory testing to evaluate sensitivity to thermal, cutaneous, and deep pressure pain. To determine the cellular phenotypes of all missense polymorphisms tested, we introduced each mutation using site-directed mutagenesis and assayed changes in function using calcium imaging and electrophysiology. We then did regression analysis to uncover associations of individual SNPs and haplotypes with tested phenotypes.

Results

Nine *P2RX7* SNPs are significantly associated with pain or immune system pathologies. Loss-of-function rs2230913 and rs7958311 are protective against several chronic pain conditions, while loss-of-function rs7958316 is protective against irritable bowel syndrome. Gain-of-function rs208294 is associated with antihistamine consumption.

Conclusions

P2X7 activity appears to be directly proportional to one's susceptibility to overactive immune system disorders and chronic pain.

EFIC5-1054

Basic Science (Anatomy/physiology/pharmacology/behaviour): Ion channels

P2X3 RECEPTOR ROLE IN MASSETER MUSCLE INFLAMMATION IN RATS

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C.13.06.1.2.19 Experiments has been financed by University of Rijeka

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Background and aims: Masseter muscle pain is one of the most conspicuous symptoms of temporomandibular disorders. Unilateral masseter muscle inflammation causes bilateral allodynia. The exact mechanism of masseter muscle pain remains unclear, but several ion channels seem to be involved in it. We investigated the role of P2X3 ion channel in inflammatory allodynia.

Methods: To establish bilateral allodynia, rats were injected unilaterally with complete Freund's adjuvant (CFA) into the masseter muscle region. Four days after CFA injection, rats were ipsilaterally injected with selective P2X3,2/3 receptor antagonist A-317491 (60µg and 6µg) into masseter muscle. Behavioral assessment included bilateral head withdrawal threshold (HWT) measurements at different time points using von Frey anesthesiometer.

Results: A significant decrease of HWT was assessed on day 4 after the CFA injection both ipsilaterally and contralaterally. Administration of A-317491 into the masseter muscle increased HWT, and the increment was significant bilaterally in both 60µg and 6µg groups.

Conclusion: Unilateral masseter muscle inflammation induces bilateral allodynia in rats. Administration of selective P2X3,2/3 antagonist A-317491 unilaterally into the masseter muscle alleviates inflammatory pain bilaterally.

ANALGESIC EFFECT OF OXYTOCIN RECEPTOR MODULATION IN HEALTHY VOLUNTEERS

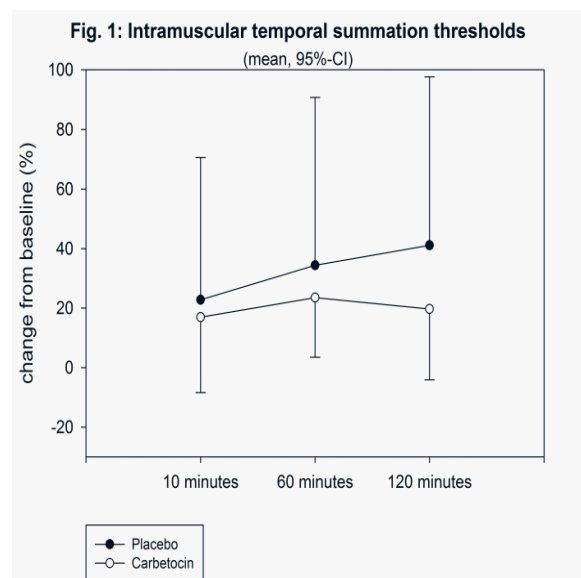
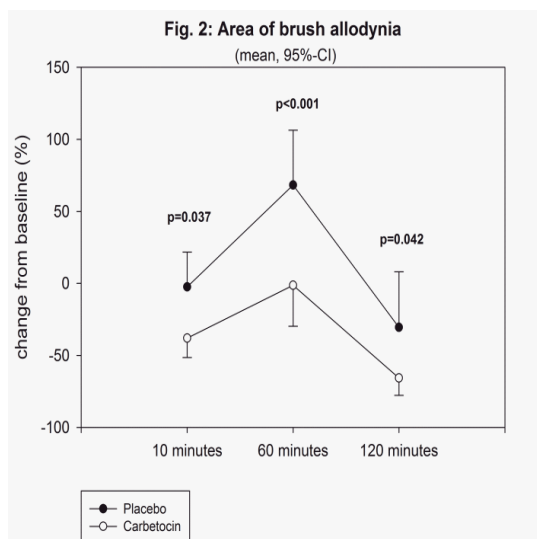
P.H. Vuilleumier¹, J. Schliessbach¹, J. Biurrun-Manresa², M. Müller¹, U. Stamer¹, L. Arendt-Nielsen², M. Curatolo³

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Background and aims: Oxytocin, a hypothalamic neuro-hormone involved in parturition and breastfeeding, may also play a role in pain modulation via descending neuronal circuits projecting to lamina I-II of the spinal cord. Activation of glutamatergic and GABAergic interneurons at this level may cause pain inhibition. Additionally to GABAergic modulation, oxytocin can selectively block A-delta and C-fibers. Intrathecally administered oxytocin prevents long-term potentiation, an important mechanism of enhanced central pain processing. The present study evaluates the analgesic effects of the oxytocin agonist carbetocin by multimodal pain testing. **Methods:** This is a randomized double-blinded placebo-controlled crossover study in 25 healthy male volunteers testing 0.1 mg intravenous carbetocin. The primary endpoint was intramuscular temporal summation threshold using electrical train-of-five stimulation at the tibialis anterior muscle. Secondary endpoints were different pain test modalities. This preliminary analysis shows results for the primary endpoint and for the area of secondary allodynia after intradermal capsaicin, analyzed by two-way RM ANOVA (with Bonferroni correction). **Results:** For the primary endpoint, there was no significant difference between carbetocin and placebo at any time (interaction $p=0.6$, fig. 1). The area of secondary allodynia was significantly lower with carbetocin, compared to placebo (joint $p<0.001$). Figure 2 shows percent changes in the area of allodynia (p values adjusted for multiplicity by Bonferroni method). **Conclusions:** This preliminary analysis failed to demonstrate an analgesic effect of carbetocin on the primary endpoint, but is suggestive for an anti-allodynic effect of this compound.



EFIC5-0061

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

ELECTROPHYSIOLOGICAL CORRELATES OF EXPERIMENTAL PAIN PERCEPTION

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Objective: Identify pain markers remains a major scientific and medical problem. In this view, we studied the dynamics of central and autonomic responses to tonic painful stimuli.

Methods: Twelve healthy subjects underwent 2 tonic painful (hand electrical stimulations and 10°C water immersion) and 2 non-painful (hand 15°C water immersion and stressful cognitive) tests during 2 minutes. Continuous 128 electroencephalographic (EEG) derivations, pupillary, electrodermal conductance, heart rate and blood pressure were recorded, with pain ratings. Time-frequency analyses were applied to EEG and autonomic measures. Loreta® and BESA were used to estimate the location of EEG activities.

Results: A significant contralateral decrease in alpha power occurred in parietal-central regions during the 2 painful but not in non-painful conditions, with involvement of somatosensory, dorsolateral and anteromedial prefrontal cortices. Electrodermal conductance and pupil dilation showed large and reproducible variations during painful and stressful non-painful conditions, while cardiovascular responses were only responsive to the latter.

Conclusions: These results suggest a specific electrophysiological response to experimental pain, based on the combination of EEG-alpha power decrease with electrodermal and pupil autonomic responses. This work highlighted a combination of non-invasive pain markers that may be tested in various clinical settings to detect pain in non-communicative patients.

CATASTROPHIZING AND OESOPHAGEAL PAIN SENSITIVITY

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Background and aims: To evaluate individual emotional states of pain, catastrophizing scale (PCS) scores can be used. The present study aimed to investigate the association between catastrophizing and oesophageal pain sensitivity, as well as the association between catastrophizing and the magnitude of acid-induced oesophageal sensitization.

Methods: The trial consisted of a training visit and two distinct study visits. A pain catastrophizing questionnaire was filled out by each subject (25 healthy males). A multimodal probe was placed in the oesophagus for induction of experimental pain (mechanical, thermal and electrical stimuli), followed by perfusion with acid (0.1 M HCl) after which the stimuli were repeated for assessment of sensitization.

Results: At baseline, a significant correlation was found between PCS scores and mechanical pain thresholds ($r = -.42$, $P < .05$) as well as electrical pain thresholds ($r = -.52$, $P < .01$).

Furthermore, after acid perfusion, a significant correlation was seen between PCS scores and mechanical pain thresholds ($r = -.50$, $P < .05$) and electrical pain thresholds ($r = -.50$, $P < .05$). No significant correlation was found between PCS scores and thermal pain thresholds at either baseline ($r = -.24$, ns), or after acid perfusion ($r = -.28$, ns). Catastrophizing was not associated with the magnitude of acid-induced oesophageal sensitization for either pain modalities (all $P > .05$).

Conclusion: High catastrophic thinking is associated with lower pain thresholds for mechanical and electrical oesophageal stimulations. However, catastrophizing does not influence the magnitude of acid-induced oesophageal sensitization.

DIETARY INTAKE MEDIATES THE RELATIONSHIP BETWEEN BODY FAT AND PAIN*C.F. Emery¹, K.L. Olson¹, A. Bodine¹, V.S. Lee¹, D. Habash²*¹*Psychology, Ohio State University, Columbus, USA*²*Health and Rehabilitation Sciences, Ohio State University, Columbus, USA*

Background and aims: Prior studies documenting an association between obesity and pain have not addressed mechanisms. Dietary intake influences blood levels of inflammatory cytokines, which are associated with obesity and pain. This study evaluated healthy dietary intake (e.g., higher anti-oxidants, lower saturated fat) as a mediator of the relationship between adiposity and bodily pain.

Methods: 100 community-residing adults (mean age=43.4, SD=15.3; range 20-78 years) were recruited for a study of home environment, food-related behaviors, health, and adiposity. Comprehensive in-home assessments were conducted, including body fat measured via bioimpedance analyzer, body mass index (BMI) calculated from measures of height and weight, pain assessed with Bodily Pain (BP) subscale of the Medical Outcomes Study Short Form-36 (SF-36), and interviewer-administered 24-hour food recall to generate Healthy Eating Index (HEI) score. Higher HEI scores reflect healthier diet; higher BP scores reflect lower pain. Data were analyzed with the PROCESS macro (Hayes, 2012) in SAS 9.3 which generates bootstrapped confidence intervals to test direct and indirect effects between the predictor and outcome variables.

Results: Mean BMI was 30.3 (7.8), ranging from normal weight (18.2) to severe obesity (53.3). BMI was correlated with BP ($r = -0.30$, $p < 0.01$), but HEI mediated the relationship as shown in Figure 1. HEI also mediated the relationship between body fat and BP.

Conclusions: Dietary intake of less healthy foods may be a behavioral pathway in the relationship between obesity and pain.

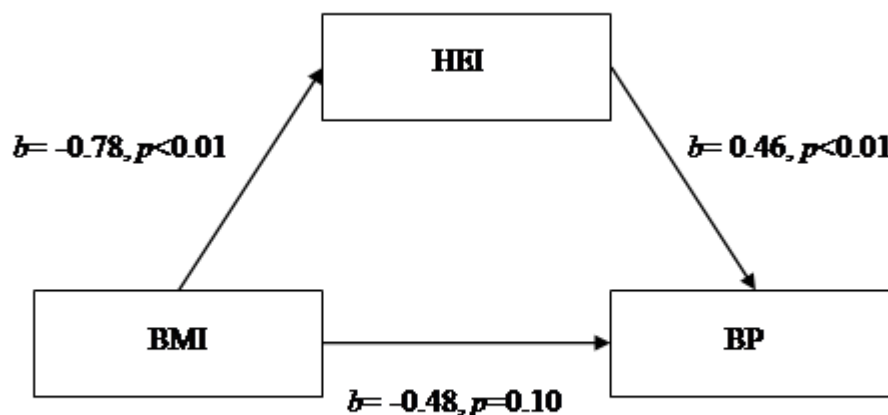


Figure1. Parameter estimates

SOMATOSENSORY PROFILING OF THE COUNTER-IRRITATIVE PROPERTIES OF L-MENTHOL IN A HUMAN MODEL OF INFLAMMATORY PAIN INDUCED BY TOPICAL TRANS-CINNAMALDEHYDE

H. Andersen¹, P. Gazerani¹, S. Boudreau¹, L. Arendt-Nielsen¹

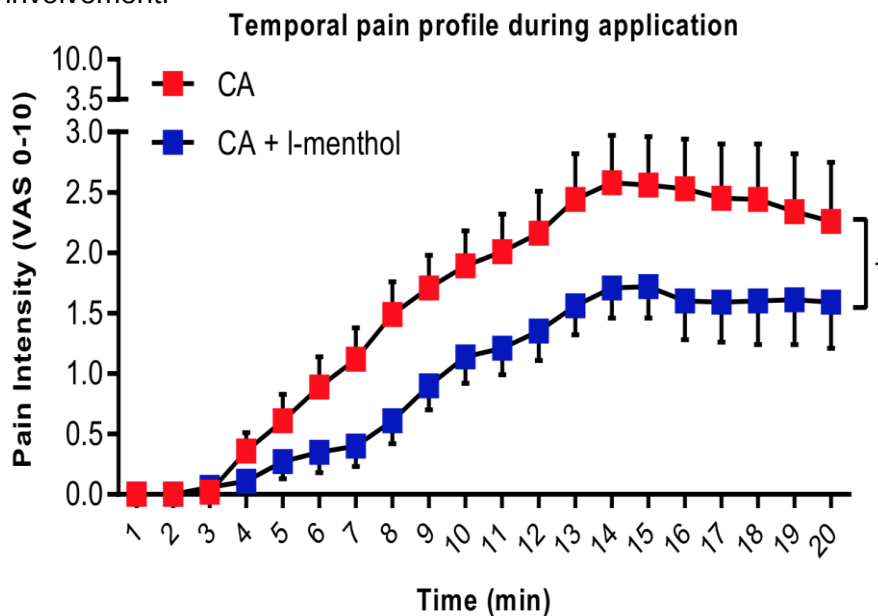
¹Department of Health Science and Technology - Center for Sensory-Motor Interactions, Aalborg University, Aalborg, Denmark

Background and aims: Topical L-menthol is used traditionally as a remedy for its local counter-irritant properties on mild inflammatory sensations. Being a naturally occurring substance, the use of topical L-menthol for pain/itch indications is empirically established, but evidence regarding its efficacy is minimal. The aim of this study was to characterize the effectiveness of L-menthol as a topical counter-irritant to TRPA1-mediated pain and hypersensitivity.

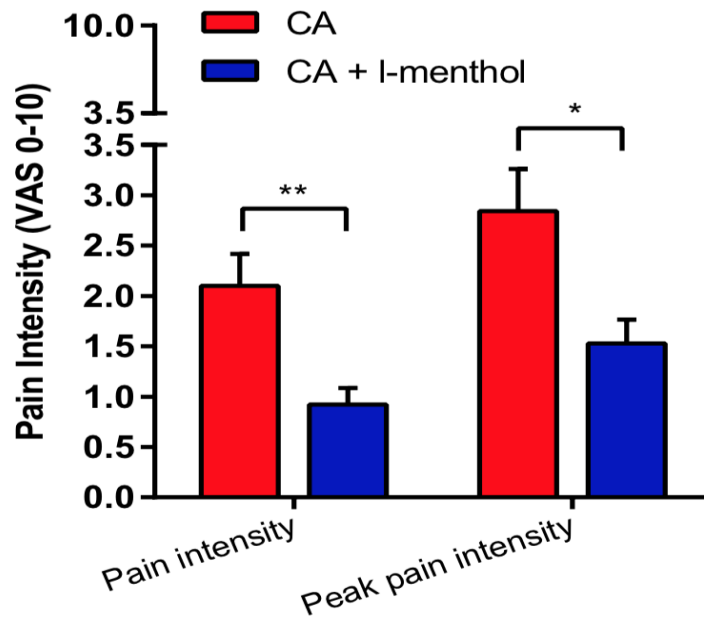
Methods: In this randomized, double-blinded study the topical irritant TRPA1-agonist trans-cinnamaldehyde (CA) was used to evoke localized burning pain, neurogenic inflammation, mechanical and thermal hyperalgesia in healthy male/female (6/8) participants. In one of two sessions, 10% CA alone or 40% L-menthol and 10% CA was applied on the volar forearm for 20 min during which subjects rated spontaneous pain intensity (VAS₀₋₁₀). Quantitative sensory testing, as modified from the German Research Network on Neuropathic Pain (DFNS) protocol and superficial blood flow were recorded pre and post-application.

Results: Spontaneous pain, primary and secondary neurogenic inflammation (increased blood flow) and hyperalgesia (thermal and mechanical hypersensitivity) followed CA application. However, co-administration of L-menthol reduced spontaneous pain intensity ($p < 0.01$), neurogenic inflammation ($p < 0.01$), area of secondary hyperalgesia ($p < 0.01$), heat hyperalgesia ($p < 0.05$), but not primary mechanical hyperalgesia.

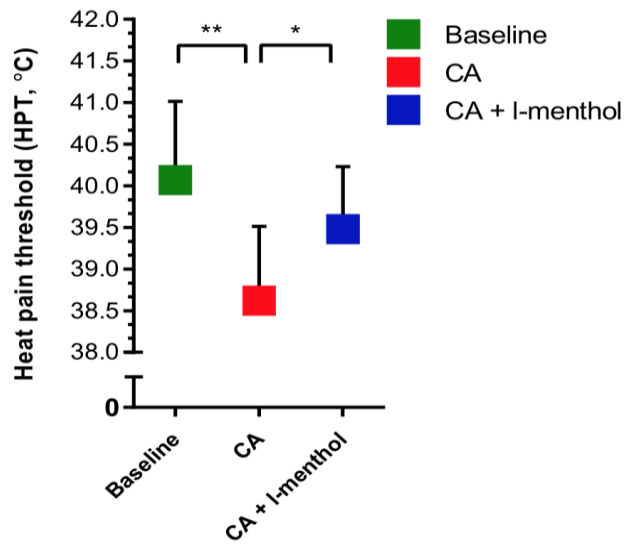
Conclusions: L-menthol as a counter-irritant exhibited alleviatory effects on pain and associated somatosensory properties in a human surrogate model of TRPA1-mediated neurogenic inflammation. Optimized clinical trials would provide adequate information for effectiveness and safety pattern of topical L-menthol for inflammatory pain conditions of the skin with TRPA1-involvement.



Pain intensity and peak



Heat pain threshold



THE EFFECTS OF MORPHINE AND METHYLNALTREXONE ON GASTROINTESTINAL PAIN IN HEALTHY MALE PARTICIPANTS

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Background

Opioid antagonists are increasingly used to abolish the gastrointestinal side effects of opioids. However, they can potentially interfere with local analgesia exerted via opioid receptors in the gut. Thus, in the current study we aimed to explore the effect of rectal morphine before and after blocking opioid receptors outside the central nervous system with methylnaltrexone.

Methods

In this randomized, placebo controlled, cross-over study 15 healthy male participants received the following drugs at three separate sessions: 1) placebo 2) 30 mg morphine administered per rectum or 3) 12 mg methylnaltrexone given subcutaneously before 30 mg rectal morphine. At baseline and after drug administration peripheral and central effects of the drugs were assessed by experimental pain to the skin, muscle and rectum as well as pupillometry.

Key results

Compared to placebo there was no local effect of morphine on mechanical rectal distension. In contrast, an increase in tolerated volume was seen following methylnaltrexone/morphine administration ($P < 0.001$), starting 7 minutes after dosing. Both morphine and methylnaltrexone/morphine had a central effect manifested as an increase in mechanical muscle pressure thresholds (both $P < 0.001$) and a decrease in pupil diameter (both $P < 0.001$). These effects occurred 30 minutes after dosing.

Conclusion and inferences

No peripheral analgesic effect of morphine was found. Methodological shortcomings may have contributed to the lack of peripheral analgesia and thus, a peripheral morphine effect on rectal pain cannot be excluded. On the other hand, the combination of methylnaltrexone and morphine exerted a local effect on rectal distensions and seems to improve analgesia.

SINGLE NUCLEOTIDE POLYMORPHISMS IN COMT AND OPRK GENES ARE ASSOCIATED WITH PAIN SENSITIVITY IN HUMANS

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Background and aims

Pain perception is associated with inter-individual variation. These variations can be affected by cultural and social factors, gender, age, and the genetic polymorphisms. The aim of this study was to investigate if polymorphisms in the three opioid receptor genes (OPRM, OPRD, and OPRK), in the catechol-O-methyl transferase (COMT) gene or in the multidrug resistance (MDR) gene were associated with pain sensitivity in healthy volunteers.

Method

DNA was available from 38 participants out of 40. Nineteen different single nucleotide polymorphisms were included in the statistically analysis. We investigated if polymorphisms in different genes (OPRM, OPRK, OPRD, COMT and MDR) influence pain sensitivity in healthy participants during experimental pain tests including skin stimulation, muscle stimulation, bone stimulation, visceral stimulation (mechanical, electrical, and thermal) and cold pressor test.

Results

The COMT rs4680A allele (AA + AG) was associated with less pain sensitivity to bone pressure ($p=0.010$). In addition, the OPRK rs6473799C (CC/CT) was associated with less pain sensitivity during visceral pressure stimulation ($p=0.02$). For the remaining single nucleotide polymorphisms, no associations were found (all $p>0.05$).

Conclusion

An association was found between pain sensitivity and SNPs in COMT and OPRK. However, this study was a preliminary and hypothesis generating study due to the relatively small study size. These findings may be used to generate hypotheses for testing in larger clinical trials of patients with painful conditions.

EFIC5-0311

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

DEVELOPMENT OF A HUMAN IN VIVO TARGET-ENGAGEMENT MODEL FOR TRPA1 ANTAGONISTS

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Background and aims

TRPA1 is a cation channel that functions as a cellular sensor, sensitive to mechanical, chemical and thermal stimuli. TRPA1 is involved in persistent to chronic painful states such as inflammation, neuropathic pain and diabetes. Therefore, TRPA1 is an emerging target for controlling pain.

We aim to develop a reproducible human in vivo target-engagement model for TRPA1 by activating the channels with local application of cinnamaldehyde (CA). Part 1: dose finding; Part 2: within-subject reproducibility based on concordance correlation coefficient (CCC).

Methods

Part 1: healthy subjects received topically 3%, 10%, and 30% CA at predefined sites on the volar surface of the right forearm. Part 2: subjects received topically two 10% CA doses during 2 visits separated by a washout period of at least 7 days. CA-induced changes in dermal blood flow (DBF) were assessed by laser Doppler perfusion imaging at 10, 20, 30, 40 and 50 minutes post-CA expressed as area under the curve from 0 to 30 minutes post-CA (AUC₀₋₃₀).

Results

Part 1: all doses of CA increased DBF (n=11, p<0.05, ANOVA), compared to placebo at all time-points, with the maximum response at 10-20 min post-CA. Part 2: using 10% CA, arm-to-arm reproducibility was almost perfect (n=6, CCC=0.90); period-to-period reproducibility moderate (n=11, CCC=0.69). Based on sample size calculations, a sample size of 10 subjects is needed to detect a 30% shift between groups.

Conclusion

Cinnamaldehyde induces a reproducible within-subject increase in DBF. We provide a non-invasive human model to evaluate peripheral target engagement of TRPA1 antagonists.

EFIC5-0330

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

A PRELIMINARY INVESTIGATION OF THE RELATIONSHIP BETWEEN PAIN SENSITIVITY, BODY FAT DISTRIBUTION AND BLOOD LEVELS OF IL-6, CRP, TNF-A AND LEPTIN.

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Background and aims: Obese individuals have increased concentrations of pro-inflammatory cytokines and some other markers of inflammation and an increased risk of metabolic disorders. The relationship between obesity, pro-inflammatory cytokines and pain sensitivity response is not fully understood. **Aim of the Study:** To investigate associations between body fat distribution, C reactive protein (CRP), interleukin 6 (IL-6), tumour necrosis factor alpha (TNF- α), leptin and pain sensitivity in adults.

Methods: 38 adults (n=18 women) were grouped as normal weight (n=22) or obese (n=16), based on body mass index (BMI). Measurements of pressure pain and cold pressor pain sensitivity response, biomarkers (venous blood), and body composition (dual X-ray absorptiometry) were evaluated for each participant.

Results: Pressure pain threshold was significantly lower in obese (mean $\pm$ SD= 340.93 $\pm$ 93.58 kpa) compared to the normal weight group (447.45 $\pm$ 203.72 kpa, p=0.039, t-test). Forward regression suggested that high gynoid fat (g) was associated with lower pressure pain thresholds (β = -0.383, p=0.028), high lower limb fat (g) was associated with lower cold pain thresholds (β =-0.495, p=0.003) and high IL-6 predicted higher cold pain tolerance (β =0.345, p = 0.049). Women were more sensitive to pressure pain (P=0.03).

Conclusion: Gynoid and lower limb fat content affected pain sensitivity response in adults, with those of more fat content were more sensitive to pain. However, this may be a reflection of the sex differences in pain sensitivity as women have more gynoid and leg fat contents

FUNCTIONAL TTX-RESISTANT SODIUM CHANNELS OF HUMAN IPS AND ES CELL-DERIVED NOCICEPTIVE NEURONS IDENTIFY AN EARLY DEVELOPMENTAL STAGE

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The incidence of chronic pain can be estimated to be 20-25% worldwide, setting the research focus on revealing the basic mechanisms of pain and the development of more effective pain treatments. Cellular mechanisms of nociception are mostly studied in sensory neurons of rodents, as human nociceptors are rarely available, implicating severe drawbacks in our understanding of human pain.

Human pluripotent stem cells (hPSC) offer the opportunity to generate distinct neuronal phenotypes including nociceptors-like cells. Using a chemical based approach, we generated human nociceptive sensory neurons that expressed BRN3A, Peripherin, TrpV1 and P2RX3, all markers of nociceptors. These stem cell-derived sensory neurons showed electrophysiological properties indicative for the presence of tetrodotoxin sensitive (TTXs) and resistant (TTXr) voltage-gated sodium channels (Navs). In contrast to their counterparts from rodent dorsal root ganglia neurons, TTXr currents of hPSC-derived nociceptors unexpectedly display a significant shift of the voltage dependence of activation and fast inactivation towards more hyperpolarized potentials. The reason for this apparent discrepancy is most likely a substantial expression of the developmentally important Nav1.5 channel. In view of the obstacles to recapitulate neuropathic pain in animal models, our data advance hPSC-derived nociceptors as a better suited model to study developmental and pathogenetic processes underlying pain in humans and may help to develop new pain treatments.

EFIC5-0430

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

HIGH-FREQUENCY CONDITIONING ELECTRICAL STIMULATION OF GLABROUS SKIN FAILED TO INDUCE HETEROTOPIC LONG-TERM POTENTIATION (LTP)

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Background and aims: High-frequency electrical stimulation (HFS) can induce perceptual correlates of long-term potentiation (LTP) of nociceptive synaptic transmission causing hyperalgesia at both homo- and heterotopic zones of hairy skin [1]. This study investigated if similar effects can be induced in thick glabrous skin underneath the foot sole.

Methods: HFS was applied through a circular pin electrode placed at the metatarsal region in 21 healthy subjects (large anode on the foot dorsum). HFS consisted of 5 trains of 50 constant-current pulses (2 ms, 100 Hz) felt as 5 individual 1 s stimuli with 9 s interstimulus intervals. Stimulation intensity was 10 times the detection threshold [1]. Somatosensory perception was tested by pinprick stimuli using a Von Frey hair (4 sites around the conditioning electrode) and electrical stimuli (stimulation intensity of 1.3× pain threshold through the conditioning electrode), delivered immediately before and 5 minutes after HFS. In addition, nociceptive withdrawal reflex thresholds were estimated to electrical stimulation of the sural nerve and through the conditioning electrode before and after HFS. Two sessions were performed 48 h apart (conditioning and control) in randomized order. Two-way repeated measures ANOVA was used for statistical analysis (factors: time and session).

Results: Pain sensitivity to electrical stimulation was significantly higher after HFS ($p=0.01$). No significant results were identified for the remaining tests.

Conclusions: Results indicate that HFS induced homotopic hyperalgesia in the glabrous skin. However, lack of significant heterotopic effects challenge the role of heterosynaptic facilitation in LTP.

[1] Klein et al. Pain 139 (2008) 507-519

PAIN QUALITY AFTER ELECTRICAL AND CHEMICAL STIMULATION OF THE SKIN AND DEEP SOFT TISSUES

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Background and aims

The diversity of pain quality has been suggested to be based on pain origin. We have investigated differences in pain qualities evoked by several tissue types following electrical and chemical stimulation of the skin/subcutis, the *thoracolumbar fascia* (TLF) and muscles of the lower back.

Methods

Electrical stimulation (single and high-frequency) of the skin (at the forearm) was performed with surface electrodes (41 volunteers; 26 ± 2.5 years) whereas deep tissue stimulation (16 volunteers; 24 ± 0.5 years) with bipolar concentric needle electrodes placed at lumbar level (L3/L4) into the TLF and the *multifidus muscle*. Chemical stimulation (hypertonic saline and capsaicin) of the TLF and the *erector spinae muscle* included 12 healthy volunteers (24 ± 1.5 years).

Results

Single electrical pulses applied on the skin elicited “stinging” pain sensations. The fascia revealed pain qualities such as “scalding”, “stinging” and “hot”, whereas muscle stimulation was described as “crippling”, “beating”, “throbbing” and “dull”.

High-frequency pulses led to “stinging” and “tearing” pain sensations in the skin and “burning”, “stinging” and “hot” dominated after HFS of the fascia whereas muscle-HFS elicited “dull”, “pushing” and “gnawing” pain qualities.

Hypertonic saline stimulation of the subcutis led to “burning” and “stinging”, whereas the the fascia showed “beating” and “throbbing” sensations. Muscle stimulation revealed “beating” qualities. The capsaicin stimulation of the fascia and the muscle led to burning and cramp-like pain sensations, respectively.

Conclusion

Pain quality might narrow the origin of pain in order to allow treatments targeting the source of pain selectively.

Federal Ministry of Education and Research (Grant # 01EC1010B)

LOAD OF SHORT TELOMERES IS INCREASED IN MIDDLE-AGED MEN WITH PAIN

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Background and aims: Chronic pain is a complex condition, with inflammation, oxidative stress and mitochondrial dysfunction as possible pathogenic factors. Telomeres, the biological clock of the cell, are thought to represent an individual's accumulated exposure to stress (e.g. inflammation and oxidative stress) as well as the individual's ability to cope with stress (e.g. DNA damage repair capacity and mitochondrial function). Pain has previously been found to associate weakly with shorter mean telomere length. Having previously shown that stress-induced telomere shortening is better measured by load of short telomeres than by mean length, we hypothesized that load of short telomeres would be increased in pain patients.

Methods: We investigated two measures of telomeres, the load of short telomeres and the mean telomere length (LTL) in blood borne leukocytes, in middle-aged men reporting considerable pain in comparison to men reporting no pain.

Results: We found that men with considerable long-lasting pain had more short telomeres, but same mean LTL as men without pain. Further we found that men with a high load of short telomeres had increased odds of having pain. This remained significant after including covariates (smoking status, alcohol consumption, BMI, disturbed sleep, Major Depression Inventory Score, hsCRP), while the association between mean LTL and pain was weak if any.

Conclusions: We find that load of short telomeres, a measure of stress-induced telomere shortening, is increased in males with pain. We suggest that load of short telomeres should be further investigated as a biomarker for increased risk of developing chronic pain.

WORK-RELATED SLEEP RESTRICTION INCREASES SUBJECTIVE PAIN, BUT NOT EVENT-RELATED POTENTIAL AMPLITUDE

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Background and aims: Prospective studies indicate that sleep disturbances are associated with up to two-fold risk for developing chronic pain. The aim of the present study was to determine if night work altered subjective pain ratings and event-related potentials in response to painful electrical stimulation. A secondary aim was to determine if the potential night work-induced changes were mediated by negative expectations.

Material and methods: Twenty-eight self-reported healthy nurses (22 female) participated in a single-blind cross-over laboratory experiment with two sleep conditions; habitual sleep (HS) and sleep restriction (SR) in randomized order. Sixty painful electrocutaneous stimuli were delivered to the forearm, one third of them after induction of negative expectations (nocebo). Subjective pain was rated on a visual analogue scale (VAS). Electroencephalography was recorded and event-related potentials were quantified from the vertex (Cz) electrode. Sleepiness was rated by Karolinska sleepiness scale (KSS).

Results: Subjective sleepiness and pain increased significantly after SR, compared to after HS ($p < 0.001$ and $p = 0.01$, respectively). The amplitude of the event-related potentials (N2P2) was unchanged ($p = 0.8$). The effect of SR on subjective pain was not affected by placebo ($p = 0.74$, sleep x placebo interaction).

Conclusions: Work-related sleep restriction increases electrically induced subjective pain, but not event-related potential amplitude. The increase in pain was not mediated by negative expectations.

Acknowledgements: Jorid Thrane Stuenæs is acknowledged for performing the lab tests.

EFIC5-0622

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

BEHAVIORAL RESPONSES AND PAINFUL STEADY-STATE EVOKED POTENTIALS TO REPEATED NOXIOUS STIMULATION AND IN RELATION TO SPATIAL ATTENTION

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Background and aims: Investigation of tonic pain is important, but rare in experimental pain research. We thought that steady state stimulation with painful electrical stimuli might become an additional model. This study aims: 1. to demonstrate the existence of steady-state evoked potentials to repeated painful electrical stimulation, i.e., the existence of pain steady-state potentials (PSSEPs) and 2. use the paradigm to investigate whether selective spatial attention modulates EEG responses to repeated painful stimuli.

Methods: High intensity transcutaneous electrical stimuli were delivered to both hands. One hand received stimulation with 31 Hz while the other hand received simultaneous stimulation with 37 Hz. After a period of stimulation with undirected attention, subjects' attention was guided to one hand. Subjects had to detect a small gap within the stimulation train that occurred occasionally in these trains. Thereby, subject attend to one hand while ignoring the other.

Results: Both stimulations produced considerable pain perceptions that were perceived by the subjects as tonic pain. Moreover, PSSEPs were found for both frequencies. PSSEPs showed a preponderance on the hemisphere contralaterally to the stimulated hand. Unexpectedly, the magnitude of PSSEPs was not modified by directed spatial attention.

Conclusion: Our results clearly demonstrate that repeated electrical stimulation can be used as a model of tonic pain; moreover, it produces PSSEPs. Importantly, results indicate that attention can hardly be shifted between two simultaneously applied tonic painful stimulations.

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EFIC5-0628

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

DIFFERENTIAL EFFECTS OF OXYCODONE AND VENLAFAXINE ON THE HUMAN NEUROAXIS

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Background and aims: No studies have compared the detailed activations of opioids and serotonin–norepinephrine reuptake inhibitors (SNRIs) in the human neuroaxis. The purpose of the study was to investigate the effect of an opioid, a SNRI and placebo on the sequential activation of the pain system at different levels of the neuroaxis.

Methods: A randomized, double-blinded, three-way cross-over study in 20 healthy male volunteers was conducted. Each participant was treated with oxycodone 10 mg BID, venlafaxine 37.5mg BID or placebo BID for 4 days. Quantitative sensory testing was performed at baseline and after treatment and included hand in cold water and heat pain stimulations at the forearm. The nociceptive withdrawal reflex (NWR) (reflecting spinal activity) was induced by electrical stimulation under the foot. Evoked potentials (electrical stimulations at the median nerve) were measured at the cervical and supraspinal level. Conditioned pain modulation (CPM) was induced by hand cold pressor test and the effect was measured by heat pain stimulation.

Results: Oxycodone and venlafaxine changed the brain activation at different cortical levels due to NWR and median nerve activations (all $P < 0.05$). Only venlafaxine reduced the size of the NWR ($P < 0.05$), and there was a tendency towards increased coherence and small worldness in the brain activity during tonic cold pain. There were tendencies towards oxycodone decreased thermo-sensation and venlafaxine increased CPM.

Conclusions: Oxycodone and venlafaxine showed differential effects on the human neuroaxis. Oxycodone globally changed the cortical activation. Venlafaxine reduced the spinal reflex and changed the brainstem and limbic-cortical activations.

EFIC5-0768

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

IMMUNE CELLS AND FATIGUE IN FIBROMYALGIA SYNDROME PATIENTS

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Background and aims

Fibromyalgia syndrome (FMS) is one of debilitating diseases. Its prevalence about 1-4% in general populations. Pain, fatigue, cognitive symptoms, sleep disorders, and mood related disorders are some symptoms that are commonly found in FMS patients. These symptoms lead to the reduction of health related quality of life. The pathomechanisms of FMS still needs to be elucidated further. Data related to the immune systems, including cytokines have been reported. Although the results is still not showing a good agreement, but there is no questions regarding the role of immune systems in the pathomechanism of FMS. As fatigue is one of important comorbidities, in this study we would like to find the association between immune cells and fatigue in FMS patients.

Methods

116 female FMS patients were recruited according to the criteria of American College of Rheumatology 1990. They have 18-70 years of age. They were asked to rate their fatigue score according to the visual analogue scale (0-10). Immune cells were measured by using FACS machine from peripheral blood after about 10 hours fasting. Statistics analysis was done with Spearman's correlations by using SPSS 22.0

Results

Our results demonstrated correlation of fatigue with CD4 (R:0.0212; $p<0.05$), CD8 (R:-0.203; $p<0.05$), ratio of CD4/CD8 (R:-0.225; $p<0.05$) and NKT cells (R:0.238; $p<0.05$) .

Conclusions

Our data support the role of immune cells in FMS patients, particularly in association with fatigue symptom. However further studies are needed to elucidate the association between immune systems and other symptoms.

EFIC5-0817

Basic Science (Anatomy/physiology/pharmacology/behaviour): Human pain models

A TWO-PART, RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED, FOUR-WAY CROSS-OVER, SINGLE DOSE STUDY TO VALIDATE A PAIN MODEL BATTERY IN HEALTHY SUBJECTS.

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This study's aim was to investigate the ability of a battery of pain models to detect analgesic properties of commonly used analgesics in healthy subjects.

The battery consisted of tests eliciting cutaneous electrical mechanical, and thermal (contact heat and cold pressor) pain and included a UVB inflammation model, the thermal grill illusion and a paradigm of inhibitory conditioned pain modulation (iCPM). Subjects were administered either (part I) a 30-minute intravenous fentanyl 50 µg/kg, phenytoin 300 mg, (S)-ketamine 10 mg or placebo (NaCl 0.9%), or (part II), a single oral dose of imipramine 100 mg, pregabalin 300 mg, ibuprofen 600 mg or placebo. Pain test measurements were performed at baseline and repeatedly up to 10 hours post-dose. Endpoints were analysed using a mixed model analysis of variance.

16 subjects completed each part. The pain tolerance threshold (PTT) for electrical stimulation was increased (all $p < 0.05$) compared to placebo for (S)-ketamine (+10.1%), phenytoin (+8.5%), and pregabalin (+10.8%). The PTT for mechanical pain was increased by pregabalin (+14.1%). The cold pressor PTT was increased by fentanyl (+17.1%) and pregabalin (+46.4%). Normal skin heat pain detection threshold (PDT) was increased by (S)-ketamine (+3.3%), fentanyl (+2.8%) and pregabalin (+4.1%). UVB treated skin PDT was increased by fentanyl (+2.6%) and ibuprofen (+4.0%). Thermal grill unpleasantness AUC decreased after administration of fentanyl (-34.3). No differences in iCPM were observed. Adverse events reported were all mild or moderate in severity.

The analgesic compounds all showed a unique profile in their effects on the pain tasks administered.

EXPERIMENTAL SLEEP RESTRICTION INCREASES LATENCY JITTER IN PAIN-ELICITED CORTICAL RESPONSES

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Background and aims

Sleep restriction (SR) has been hypothesized to sensitize the pain system. Previous studies have shown increased pain scores to painful stimulation after experimental SR, but reduced or unchanged magnitude of the event-related potentials (ERPs) to painful stimuli when averaged in the time-domain. When averaging in the time-frequency domain there are indications of an increased response magnitude. The aim of the present study was to determine whether latency jitter may contribute to this discrepancy.

Methods

Ninety brief painful electrical stimuli were delivered to the forearm skin of 21 healthy volunteers (18 - 31 years, 8 men) after two nights of 50 % SR and after two nights of habitual sleep (HS). ERPs (electrode Cz, common reference) were analyzed in the time-domain (N2 and P2 amplitude) and in the time-frequency domain (1-25Hz/1-400ms). Latency jitter was quantified by two measures; as the mean consecutive difference (MCD) between single-trial peak latencies in the time-domain and as the phase locking value (PLV) across trials in the time-frequency domain. Data were analyzed with linear mixed models.

Results

P2 MCD increased ($p=0.038$) and PLV decreased ($p=0.009$) after SR compared to after HS. No difference was found for N2 MCD.

Conclusions

Our results indicate that partial SR increases latency jitter in cortical responses to experimental pain of moderate intensity. When averaging cortical responses in the time-domain, this may lead to falsely reduced peak amplitudes.

THE EFFECT OF EXPERIMENTAL LOW BACK PAIN ON LUMBAR MUSCLE ACTIVITY IN PEOPLE WITH A HISTORY OF CLINICAL LOW BACK PAIN: A fMRI STUDY

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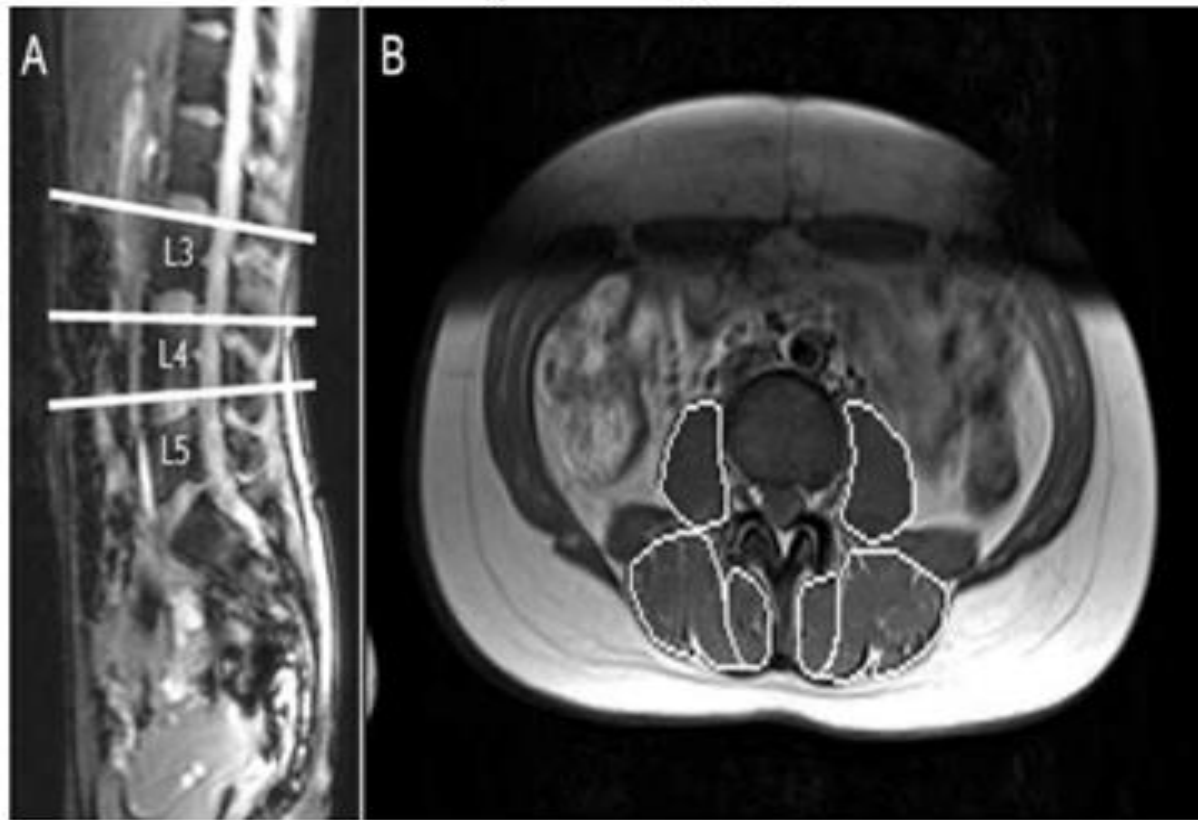
Background and aims: In people with a history of recurrent low back pain (RLBP), structural and functional alterations have been observed at several peripheral/central levels of the sensorimotor pathway. As these alterations might interact with the way the sensorimotor system responds to pain, we examined this assumption by evaluating the lumbar motor responses to experimental nociceptive input in this population.

Methods: The effect of an experimental pain paradigm on lumbar muscle activity was evaluated in 15 participants during remission of unilateral RLBP. Quantitative T2-images (muscle functional MRI) were taken bilaterally of multifidus, erector spinae and psoas at the L3 upper/L4 upper and lower endplate during several conditions: 1) at rest, 2) upon trunk-extension exercise without pain, 3) upon trunk-extension exercise with experimental induced LBP at the clinical pain-side (1.5ml intramuscular hypertonic saline injections).

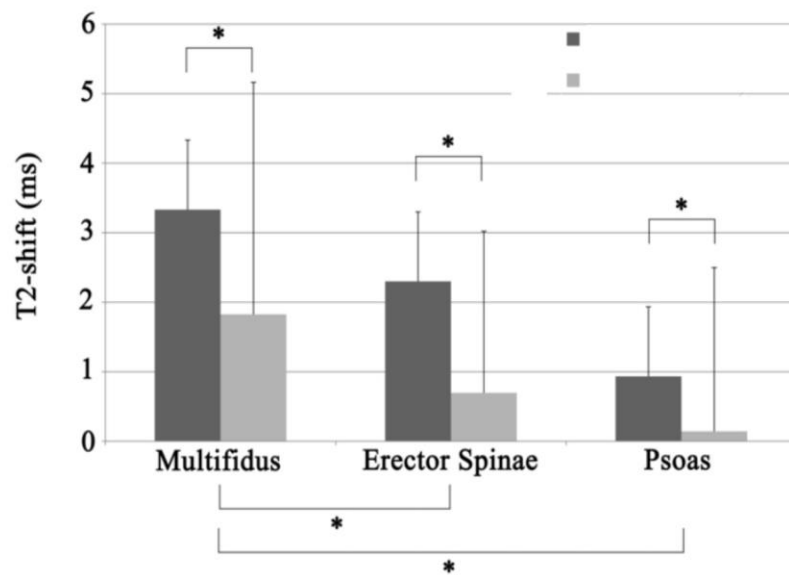
Results: The activity levels of all the lumbar muscles were significantly lower in response to the exercise-with-pain compared to the exercise-without-pain condition ($p=.038$). Pain intensity/localization from experimental LBP were similar as during recalled clinical LBP episodes.

Conclusions: Administration of experimental LBP in people with a history of RLBP effected a generalized, widespread inhibitory response in lumbar muscle activity. This response was consistent with previously established inhibitory patterns in healthy people in response to experimental induced LBP. It is striking that similar inhibitory patterns in response to pain could be observed, despite the presence of pre-existing alterations in the lumbar musculature during remission of RLBP. These results suggest that motor output can modify along the course of RLBP.

Illustration of (A) sagittal localizer MRI scan of the lumbar spine indicating axial slice positioning and (B) T2-weighted axial MRI image at the level of L4 upper endplate



T2-shifts (in milliseconds, mean + SD; adjusted means for 'body side' and 'segmental level') for the exercise in the non-painful and in the painful condition for multifidus, erector spinae and psoas.



■ = T2-shift exercise without experimental LBP, ■ = T2-shift exercise with experimental induced LBP, * = $p < .05$

SNPS AND COGNITIVE DYSFUNCTION IN OPIOID TREATED PATIENTS WITH CANCER

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Background and aim: The effects of single nucleotide polymorphisms (SNPs) in the cognitive function of opioid treated patients with cancer is unknown. This study aimed to identify associations between SNPs of candidate genes, high opioid dose and cognitive dysfunction.

Methods: Cross-sectional multicenter study (European Pharmacogenetic Opioid Study, 2005-2008); 1586 patients; 86 SNPs in 43 genes. Inclusion criteria: cancer, age ≥ 18 y, regular opioid treatment for ≥ 3 d, and available genetic data. Cognitive function was assessed by Mini Mental State Examination (MMSE). Analyses: 1) SNPs were rejected if evidence of violation of Hardy-Weinberg equilibrium ($P < 0.0005$), or minor allele frequency $< 5\%$; 2) patients were randomly divided into development sample (2/3 for initial SNPs screening) and the validation sample (1/3 for confirmatory test); 3) false discovery rate of 10% for determining associations (Benjamini-Hochberg method). Kruskal-Wallis and Mann-Whitney test were performed.

Results: Significant associations ($P < 0.05$) between MMSE scores and SNPs in the genes *HTR3E*, *TACR1*, and *IL6* were observed in the development sample, but the replication in the validation sample did not confirm it. Associations between MMSE scores among patients receiving ≥ 400 mg morphine equivalent dose/day ($n=377$) and SNPs in *TNFRSF1B*, *TLR5*, *HTR2A*, and *ADRA2A* were also observed in the development sample, but could not be confirmed in the validation sample. After correction for multiple testing, no SNPs were significant in the development sample. Dominant and recessive models also did not confirm significant associations.

Conclusion: The findings did not support influence of those SNPs analysed to explain cognitive dysfunction in this sample of patients.

EFIC5-0114

Basic Science (Anatomy/physiology/pharmacology/behaviour): Gene expression

NOVEL BIOMARKERS OF NEUROPATHIC PAIN

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Chronic neuropathic pain is pathologically complex, often refractory to conventional pharmacotherapy and is poorly understood. It is estimated that almost 1 in 5 adults experience moderate-severe pain and often receive ineffective or suboptimal treatment. With a growing ageing population with numerous comorbidities, this is fast becoming a significant healthcare issue that requires urgent attention. Blood biomarkers can provide us with a tool for early diagnosis which in turn, can facilitate improved diagnostics and treatment strategies. We wish to identify pain-related molecules, systems or pathways (biomarkers) in human blood with the aim of improving the understanding, diagnosis and treatment of neuropathic pain.

To identify these novel biomarkers that can discern neuropathic pain patients from healthy controls we are using a neuropathic pain pilot sample. For this we are employing a combination of quantitative PCR and Affymetrix array systems to analyse gene expression (RNA), and HPLC/Mass Spectrometry for plasma analyses.

Our preliminary data identifies several molecules that can differentiate between neuropathic pain and healthy controls. To validate our findings we are currently developing two independent neuropathic pain cohorts (case-control); one at NUI Galway and the other through the Chronic Pain Services at Leeds Teaching Hospital NHS Trust. This latter study has been adopted to the NIHR clinical research network. Molecules identified in these studies could be developed into a diagnostic test that can differentiate neuropathic pain subtypes, allowing clinicians to better treat this condition.

EFIC5-0214

Basic Science (Anatomy/physiology/pharmacology/behaviour): Gene expression

ERK AND P38 SIGNAL TRANSDUCTION PATHWAYS CONTRIBUTE TO THE MODULATION OF NOCICEPTIN AND ITS RECEPTOR

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Background and aims: Regulation of nociceptin and its receptor (NOP) has been investigated in peripheral blood of patients suffering from pain and inflammation. Mechanisms involved in their modulation in blood leukocytes are still not clear. In this study signaling pathways possibly contributing to the regulation of the nociceptin-NOP system were investigated.

Methods: After approval of the ethics committee, peripheral blood from healthy donors was cultured with/without phorbol-12-myristate-13-acetate (PMA). To investigate ERK, JNK, p38 and NF- κ B signaling pathways, blood was pretreated with kinase inhibitors PD98509, SP600125, SB203580, Bay11-7821 or the combination of PD98509 and SB203580 prior to the co-culture with PMA. Prepronociceptin (PNoc) and NOP mRNA was detected by qRT-PCR. Nociceptin concentrations in supernatants were measured using fluorescent-immunoassay. Statistics: ANOVA and Wilcoxon signed-rank test with post hoc analysis.

Results: PMA dose-dependently regulated NOP and PNoc mRNA in blood leukocytes with attenuated NOP and increased PNoc after 3h and 6h (both $p < 0.05$). PD98509 as well as SB203580 partially prevented these PMA effects. The combination PD98509+SB203580 produced enhanced antagonistic effects compared to the samples pretreated with one of these substances only (all $p < 0.05$). SP600125 and Bay11-7821 had no inhibiting effects. Increased nociceptin peptide levels were detected in the supernatants of PMA-treated blood after 24h ($p = 0.02$).

Conclusions: PMA modulates prepronociceptin and NOP mRNA in whole blood cultures which also results in an increased translation into nociceptin. The ERK and the p38 MAPKs might be two major signaling pathways contributing to the regulation of the nociceptin-NOP system in human peripheral blood during pain and inflammation.

EFIC5-0338

Basic Science (Anatomy/physiology/pharmacology/behaviour): Gene expression

THE ROLE OF CATECHOL-O-METHYLTRANSFERASE VAL158MET POLYMORPHISM IN THE PLACEBO AND MORPHINE RESPONSE IN PATIENTS WITH PAIN DUE TO DIABETIC POLYNEUROPATHY

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Background and aims

Identification of factors contributing to placebo response may affect trial design and treatment optimization. The val158met polymorphism (rs4680) in catechol-o-methyltransferase (COMT) was recently suggested as a biomarker of placebo response. We studied the role of this polymorphism in pain intensity after placebo and morphine treatment in patients with diabetic polyneuropathy (DPN).

Methods

Data from 69 DPN patients (aged 32 – 76 years) were included. All patients were treated with placebo and 31 of them were treated with morphine sulphate CR 60mg in a separate trial period in a double-blind crossover design. Both treatments were given orally once daily on 5 consecutive days. Genotyping for the rs4680 polymorphism was performed with the Algynomics' Pain Research Panel (custom Affymetrix microarray). The association between the change from baseline in average pain intensity on day 5 measured on the 11-point numerical rating scale and the COMT polymorphism was done with ANCOVA adjusted for baseline pain.

Results

The COMT genotype distribution was in Hardy-Weinberg equilibrium ($p > 0.05$); the minor allele frequency was 0.46. Mean changes in pain intensity observed for the genotypes val/val, val/met, and met/met were, respectively, -1.4 (n=12), -0.9 (n=39), and -1.2 (n=18) for placebo, and -1.6 (n=5), -2.3 (n=19), and -1.2 (n=7) for morphine treatment. The differences were not statistically significant ($p = 0.60$, and $p = 0.31$, respectively).

Conclusions

In this exploratory cohort of DPN pain patients, the val158met COMT polymorphism did not affect placebo or morphine response. Further studies are warranted to evaluate its potential role as a biomarker in different patient populations.

EFIC5-0412

Basic Science (Anatomy/physiology/pharmacology/behaviour): Gene expression

INCREASED C-FIBER RESPONSE INDUCED BY EXPERIMENTAL DISC HERNIATION IS ASSOCIATED WITH UPREGULATION OF FRACTALKINE AND ITS RECEPTOR IN NUCLEUS PULPOSUS AND DORSAL ROOT GANGLION

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Background and aims: Lumbar radicular pain following intervertebral disc herniation may be caused by a local inflammatory response induced by nucleus pulposus (NP) cells. Here in an animal model mimicking the clinical situation following disc herniation we investigated the effect of NP on the spinal nociceptive signaling and local gene expression.

Methods: In anaesthetized Lewis rats, extracellular single unit recordings of spinal nociceptive activity and qPCR were used to explore the effect of NP application onto the dorsal nerve roots (L3-L5). All animal experiments were approved by the Norwegian Animal Research Authority and were performed in conformity with the laws and regulations controlling experiments and procedures on live animals in Norway.

Results: A clear increase in C-fiber response was observed following NP conditioning. In the NP tissue, the gene expression of interleukin-1 β (IL-1 β), colony stimulating factor 1 (Csf1), fractalkine (CX3CL1) and the fractalkine receptor CX3CR1 was increased. Minocycline, an inhibitor of microglial activation, inhibited the increase in neuronal activity, and attenuated the increase in gene expression in NP tissue. Interestingly, gene expression analysis demonstrated an increase in the expression of TNF, CX3CL1 and CX3CR1 in the dorsal roots ganglion (DRG). An increase in the expression of IL-1 β and TNF in cultured DRG cells was also induced in vitro.

Conclusion: The present study suggests that hyperexcitability in the pain pathways after disc herniation may involve upregulation of CX3CL1 signaling in NP – but also in the DRG.

EPIGENETIC MODIFICATIONS IN PATIENTS WITH MUSCULO-SKELETAL INJURY; A PILOT STUDY

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Background

Over the past decade numerous studies have demonstrated that chronic pain is linked with abnormal gene expression within the cells processing the nociceptive signaling. Recent understanding of molecular mechanisms governing gene expression has point toward epigenetic regulation in response to environmental stressors. Strong evidences suggest that epigenetic modifications could possibly explain the transition from acute to chronic pain. However studies performed on human models of painful disorders remain scarce. Better characterization of these mechanisms is necessary in order to develop new therapeutic approaches for persistent pain.

Methods

24 patients recruited from our rehabilitation centre participated in this pilot study. All of them experienced chronic pain for at least 6 months. Scores for pain and anxiety/depression were calculated using validated questionnaires. Methylation analyses were performed on DNA extracted from peripheral blood, using the pyrosequencing technology. CpGs from the promoter region of 2 different genes (NR3C1 and BDNF) were analyzed. These genes were selected on the basis of their reported association with stress-related DNA methylation changes.

Results

As expected severity scores for pain were strongly associated with anxiety and depression ($r=0.6$; p

Conclusions

Despite a low number of subjects, the results of this study strongly suggest that methylation levels can be associated with pain severity in patients with musculo-skeletal injury.

INFLUENCE OF 5-HT₃ POLYMORPHISMS ON EXPERIMENTAL PAIN AND THE EFFICACY OF GRANISETRON

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Background and aims: The aim of this study was to investigate if polymorphisms of HTR3A and HTR3B contribute to pain perception and efficacy of the 5-HT₃-antagonist granisetron in experimental muscle pain.

Methods: Sixty healthy participants were genotyped regarding HTR3A (rs1062613) and HTR3B (rs1176744) polymorphisms. Pain was induced by bilateral injections of hypertonic saline (HS, 5.5%, 0.2mL) into the masseter muscle (injection 1). The muscle was then pre-treated with 0.5mL granisetron (1mg/mL) on one side and 0.5mL isotonic saline (9mg/mL) on the contralateral side in a randomized, double-blind order. This followed by another bilateral HS injection after 2 min. Pain was assessed on a 0-100 visual analogue scale (VAS) immediately after the injections and then every 15 sec until pain subsided.

Results: The first injection of HS induced pain of similar intensity on both sides (median 69.5; range 9-100). The second HS injection induced pain with (67%) lower intensity and shorter duration (125sec) on the side pretreated with granisetron (*P*'s₃-polymorphisms respectively). Neither were there any correlations between VAS pain scores and the 5-HT₃-polymorphisms.

Conclusion: This study showed that 5-HT₃-polymorphisms do not seem to directly influence experimental muscle pain. However, blocking 5-HT₃-receptors with granisetron decreased experimental pain in healthy subjects and thus may have the potential as analgesic drug in chronic myalgia.

EFIC5-0850

Basic Science (Anatomy/physiology/pharmacology/behaviour): Gene expression

OPPOSING EFFECTS OF NERVE INJURY, SURGERY AND ANAESTHESIA ON BDNF SIGNALLING IN THE MEDIAL PREFRONTAL CORTEX OF RATS

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Altered affect and cognition is often observed in the chronic pain state, and is frequently considered to be the most debilitating features of this condition. Altered *Brain Derived Neurotrophic Factor* (BDNF) signalling in the prefrontal cortex (PFC) has been implicated in the aetiology of affective disorders. Therefore, we sought to determine if rats that exhibited disrupted social behaviours following nerve injury also exhibited reductions in BDNF in the medial PFC (mPFC). Rats were behaviourally characterised as having 'disability' or 'no disability' based on alterations in social behaviour, six days after injury. BDNF protein concentrations were then determined using an enzyme linked immunoassay, and mRNA quantities of BDNF and its receptor, *Tropomyosin receptor kinase B* (TrkB) were measured using digital droplet PCR. BDNF and TrkB mRNA were both up-regulated bilaterally in rats that received halothane anaesthesia only, compared to naïve controls. This effect was reversed and further reduced in all rats that received a surgical sham-injury or nerve-injury. In addition, BDNF protein expression was decreased in the left ($P<0.001$) and right ($P=0.07$) mPFC of anaesthetised rats, and in the left mPFC of nerve-injured rats. Halothane anaesthesia results in a prolonged up-regulation of BDNF and TrkB gene expression, which is reversed by surgery and nerve injury. The alterations in gene expression were not reflected in BDNF protein levels, suggesting changes in BDNF in mPFC afferents.

NEONATAL REPETITIVE PROCEDURAL PAIN IMPAIRS SPATIAL LEARNING ABILITY IN YOUNG RATS AND INCREASES ANXIETY IN ADULT RATS THROUGH DYSREGULATION OF GLUCOCORTICOID AND BRAIN GLUCOCORTICOID RECEPTORS

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Objective To examine the effects of neonatal repetitive procedural pain on spatial learning and memory and stress response involving HPA axis function in prepubertal and adult rats.

Methods Neonatal rat pups were stimulated four times each day on P0-P7, by either needlestick (Needle group) or cotton-tipped swab (Tactile group). Mechanical sensitivity was tested by the von Frey mechanical test. All subjects were tested on P24 and P87 using the Morris water maze (MWM). HPA axis function was measured by neuroendocrine response to an open-field stressor and by gene expression.

Results From P8 to P85, mechanical hypersensitivity of the bilateral hindpaws was observed in the Needle group ($PPPP=0.001$) and ACTH ($PPPPPP<0.01$).

Conclusion Neonatal repetitive procedural pain causes persistent mechanical hypersensitivity, impairs spatial learning ability in prepubertal rats, increases anxiety in adult rats and dysregulates hippocampal GR activity and HPA axis function.

Figure 3

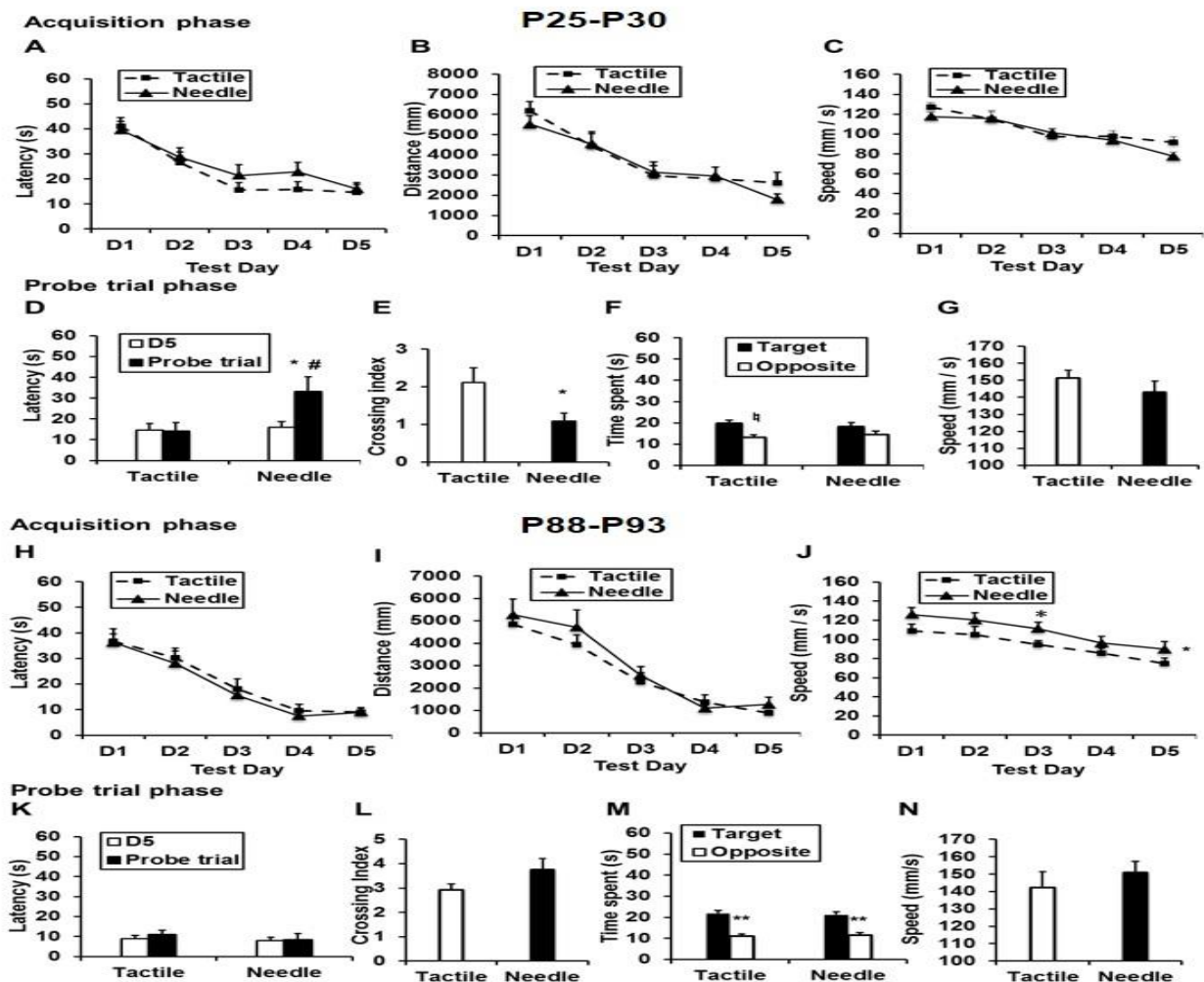


Figure 4

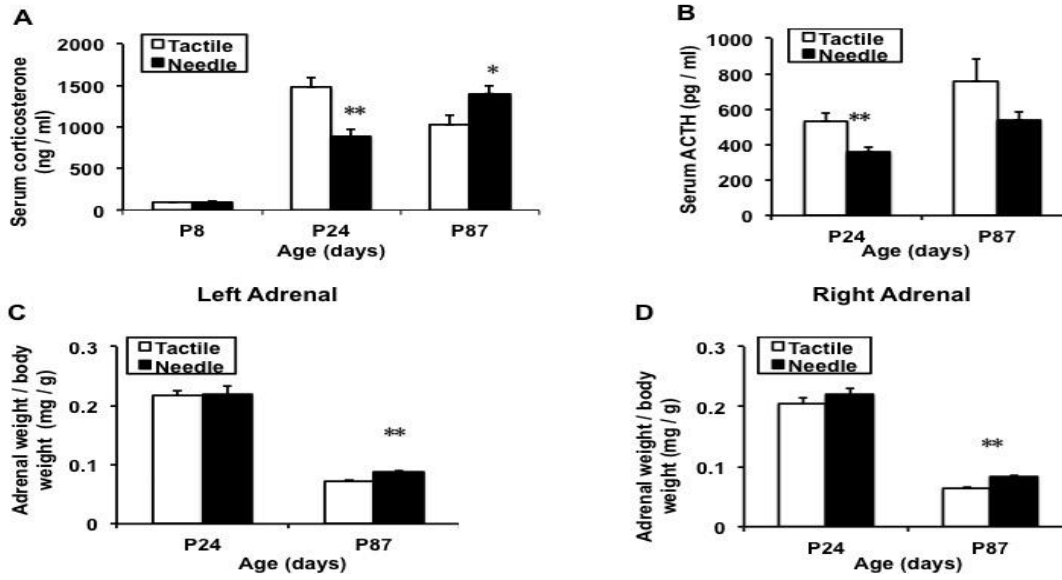
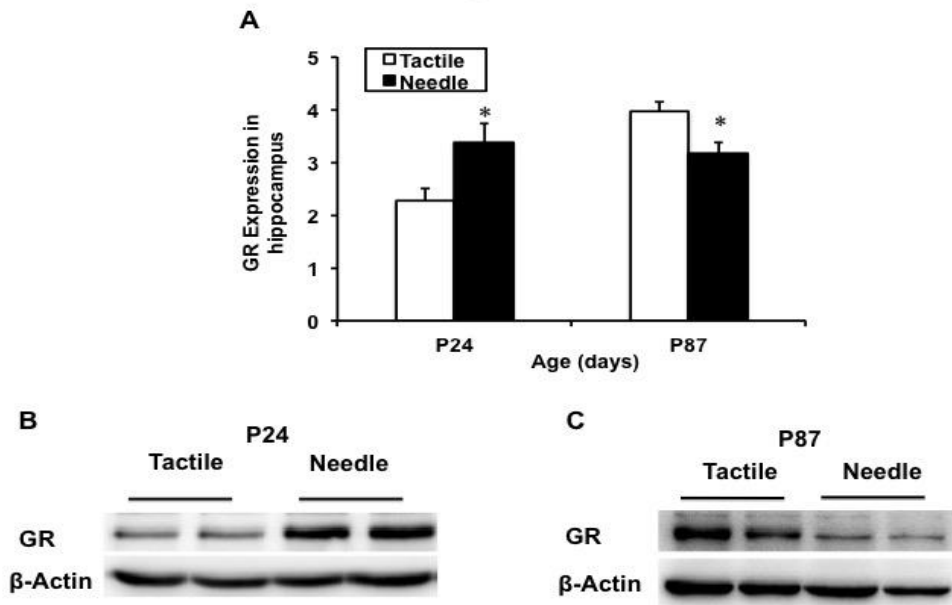


Figure 5



DIFFERENTIAL TRANSCRIPTIONAL ANALYSIS OF DAMAGED DORSAL ROOT GANGLIA NEURONS AND THEIR NEIGHBOURS IN NEUROPATHIC MICE

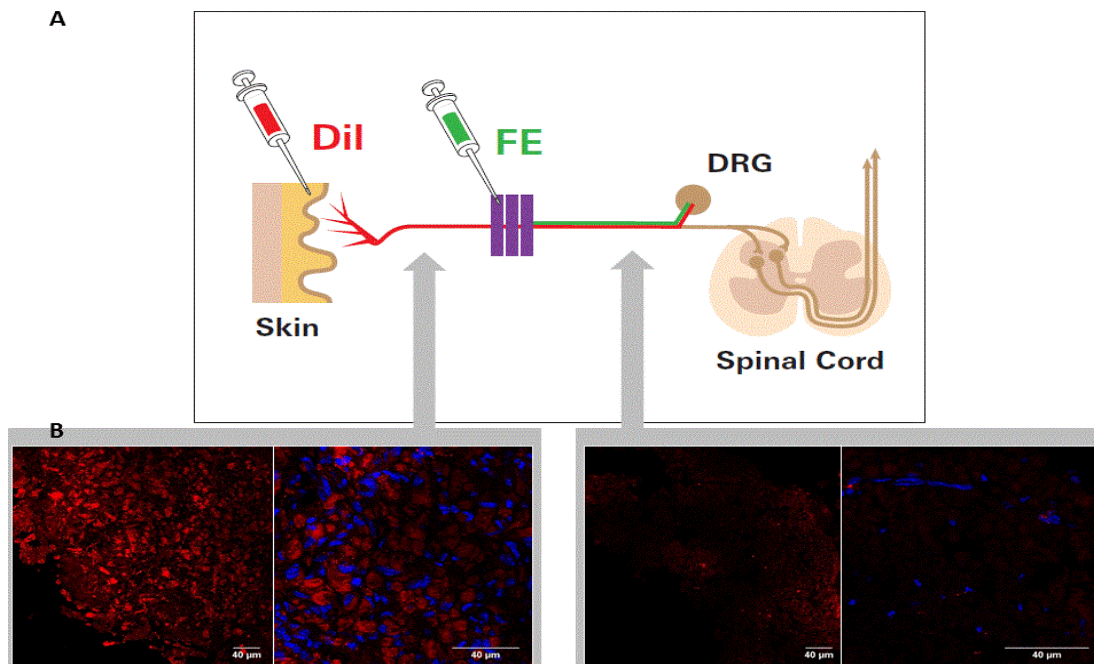
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Background and aims: In studies of neuropathy, the established approach of whole-DRG transcriptional analysis does not discriminate between different cell types or degrees of damage. In this study, we developed a differential approach using fluorescent neuronal markers. 1-diiodoacetyl-3,3,3-tetramethylindocarbocyanine-perchlorate (DiI) serves as a marker for neurons in general, fluoroemerald (FE) exclusively for damaged neurons due to impaired permeation of intact membranes. This allows transcriptional analysis specifically for damaged dorsal root ganglia (DRG) neurons as compared to adjacent neurons in a rodent model of neuropathic pain (Chronic constriction injury, CCI).

Methods: C57BL/6J mice underwent CCI, immediately followed by injection of FE (epineurally), and DiI (hindpaws bilaterally, **A**). Neurons from DRG L3-5 were sorted using flow cytometry and analyzed by microarray. qPCR was performed for 40 genes, and immunoreactivity of corticotropin-releasing hormone (CRH) examined.



Results: 7d after CCI, DiI fluorescence is markedly decreased in transections of the proximal sciatic nerve (**B**). Flow cytometry sorting shows two subpopulations, FE⁺ (damaged) and DiI⁺/FE⁻ (adjacent). Damaged neurons exhibit distinctive mRNA expression patterns, compared to both adjacent and contralateral neurons. Significantly regulated genes include known neuropathic players such as purinergic receptor P2rx3 or neuropeptides (galanin, neurotensin). The most upregulated gene in damaged neurons is CRH (>200-fold), confirmed by qPCR and immunohistochemistry.

Conclusions: DiI and FE staining *in vivo* allows differential analysis between damaged and adjacent neurons after traumatic peripheral nerve lesion. The stable distinct transcription profile of damaged neurons underlines importance and sensitivity of a differential approach, emphasized by the identification of new genes involved, such as CRH.

EFIC5-0099

Basic Science (Anatomy/physiology/pharmacology/behaviour): Tolerance and addiction

HIPPOCAMPUS SUSCEPTIBLE TO ANTINOCICEPTIVE TOLERANCE TO NSAIDS LIKE THE PERIAQUEDUCTAL GREY

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Background and aims. Pain depends not only on the regulation of nociceptive sensory systems, but also activation of mechanisms that control emotional processes in limbic brain areas such as the amygdala and hippocampus. The purpose of this study was to examine whether of non-steroidal anti-inflammatory drugs (NSAIDs) diclofenac, ketorolac and lornoxicam microinjected into the dorsal hippocampus (DH) leads to the development of tolerance in rats.

Methods. The experiments were carried out on experimental and control (saline) white male rats. Animals were implanted with a guide cannula in the DH and tested for antinociception following microinjection of NSAIDs in the volume of 0.5µl for four consecutive days into the DH in the tail-flick (TF) and hot plate (HP) tests.

Results. We found that microinjection of these NSAIDs into the DH induces antinociception as revealed by a latency increase in the tail-flick (TF) and hot plate (HP) tests compared to controls treated with saline into the DH. Subsequent tests on consecutive three days, however, showed that the antinociceptive effect of NSAIDs progressively decreased, suggesting tolerance developed to this effect of NSAIDs. Both pretreatment and posttreatment with the opioid antagonist naloxone into the DH significantly reduced the antinociceptive effect of NSAIDs in both pain models. Our findings support the hypothesis that modulation of nociceptive responses in the DH could occur in a manner similar to that proposed for periaqueductal grey.

Conclusions. Our data indicate that microinjection of NSAIDs into the DH induces antinociception which is mediated via the opioid system and exhibits tolerance.

BEHAVIORAL STUDY OF TRPV1 CHANNEL INACTIVATION BY NSAIDS

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Background and aims. It has been established that a transient receptor potential channel vanilloid subfamily V1 (TRPV1) exhibits sensitivity to capsaicin, a natural compound of chili pepper. Because some non-steroidal anti-inflammatory drugs (NSAIDs) are structural analog of prostaglandins, the aim of the present study, was to examine three widely used NSAIDs on TRPV1 activation using behavioral tests in rats.

Methods. Thermal paw withdrawal latencies (Hargreaves test) and paw mechanical thresholds (von Frey test) for both hind paws were obtained with 5, 15, 30, 45, 60, and 120 min intraplantar post-injection of capsaicin or vehicle. Twenty minutes prior to start this experimentation ketorolac, diclofenac and lornoxicam were pre-injected in the same hindpaw and animals were examined by these two tests.

Results. We found that after a pretreatment of all three NSAIDs in the ipsilateral (injected) hindpaw showing strong antinociceptive effects, capsaicin resulted in a significant decrease of the latency of the thermal withdrawal reflex compared to vehicle or the contralateral hindpaw. The same findings we observed for the paw withdrawal threshold. Nearly in a half of hour, effects of capsaicin action return to the baseline. The obtained data are different from our previous results, where TRPV1 agonist capsaicin produced nearly two hours long hyperalgesia that is expressed behaviorally in facilitation of these withdrawal reflexes.

Conclusion. Thus we showed for the first time an inactivation of TRPV1 channel by NSAIDs to this channel agonist capsaicin in behavioral assays.

Acknowledgement. Supported by the grant from Rustaveli National Science Foundation of Georgia (#31/40).

BLOCKING THE SPINAL TRPA1 CHANNEL ATTENUATES MORPHINE ANTINOCICEPTIVE TOLERANCE

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Background and aims: Prolonged application of morphine leads to antinociceptive tolerance. Suppression of spinal astrocytes or D-amino acid oxidase (DAAO) within them is known to bring back antinociceptive efficacy of morphine. Since the astrocyte-DAAO pathway is known to generate hydrogen peroxide, an agonist of the TRPA1 channel expressed spinally on nociceptive nerve terminals and astrocytes, we proposed a working hypothesis that the spinal TRPA1 contributes to morphine antinociceptive tolerance.

Methods: Nociception was assessed using heat-induced tail- and paw-flick tests in rats with a chronic intrathecal (i.t.) catheter. Drugs were administered i.t. twice daily for 7 days in four treatment groups: i) Saline control group, ii) Chembridge-5861528 (CHEM, a TRPA1 antagonist; 5 µg), iii) morphine (10 µg), iv) CHEM (5 µg) + morphine (10 µg). Before starting the 7-day drug treatment (day 0) and after it (day 8), all groups received one dose of morphine (10 µg) to assess its antinociceptive action at days 0 and 8. At day 8, mRNA for DAAO in the spinal cord was determined using qPCR.

Results: Antinociceptive effect of morphine was not influenced by saline or CHEM treatment for 7 days. In contrast, the 7-day morphine treatment produced antinociceptive tolerance, which was significantly attenuated by co-administration of CHEM. In the morphine group, spinal mRNA for DAAO was increased, which effect was reversed by co-administration of CHEM.

Conclusions: The results indicate that blocking the spinal TRPA1 channel reduces morphine antinociceptive tolerance, presumably by attenuating astrocyte activation as well as by directly preventing facilitation of nociceptive transmission.

SITE- AND DOSE-SPECIFIC ANTINOCICEPTIVE EFFECT AFTER COMBINED METHYLPHENIDATE AND MORPHINE TREATMENT IN RATS

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Background and aims. Methylphenidate (MPH) as a blocker of dopamine and norepinephrine transporters increases extracellular dopamine in the striatum and modulates dorsal raphe and locus coeruleus neuronal activities.

Methods. Antinociceptive effects of MPH and MOR in adult male Wistar rats were investigated by means of withdrawal latency in the plantar test (Ugo Basile, Italy) after single administration of MPH (1 mg/kg or 5 mg/kg s.c.), MOR (1 mg/kg or 5 mg/kg s.c) or their combination. Latencies of withdrawal reflexes of hind limbs and the tail were repeatedly measured before injection of drugs and then three additional times with 15-min intertribal intervals. The percent of the maximal analgesic response defined as $(\text{test latency} - \text{baseline latency}) / (\text{cut-off time} - \text{baseline latency}) \times 100\%$ was calculated for each rat on both nociception tasks.

Results. On the tail, both doses of MPH were without any antinociceptive effect, while 5 mg/kg MPH was effective on the hind limbs. Lower dose of MPH+MOR (1 mg/kg) enhanced antinociception both in the plantar and the tail flick tests in comparison with single doses of MPH or MOR. On the other hand, higher dose of MPH+MOR (5 mg/kg) increased antinociception in the plantar test in comparison with MOR and decreased antinociception in the tail flick test in comparison with MOR.

Conclusions. Our research supports the evidence that MPH in comparison with other psychostimulants has lower antinociceptive potency; however, in lower doses it has the ability to enhance the analgesic properties of morphine when both types of drugs are given in combination.

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DEPENDENCE LIKE BEHAVIOUR IN MEDICATION-OVERUSE HEADACHE

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Background and Aims

Medication-overuse headache (MOH), is a common condition of worsening of a pre-existing headache in parallel with an overuse of acute headache medications. Studies have suggested MOH to be similar to dependence. We have previously shown that using behavioural treatment adapted from the dependence field is effective treatment for a majority of patients. Here we further describe the dependence-like characteristics of MOH patients and controls from the mentioned study.

Methods

The study was based on MOH patients and controls recruited from the general population for a prospective randomised trial of effectiveness of behavioural brief intervention. Main assessment time-point was 3 months after intervention. Headache-related diagnoses were by interview and according to ICHD-II. The severity of dependence score (SDS) was used to assess dependence-like behaviour. All patients were diagnosed using DSM-IV criteria for substance dependence. Student's t-test, chi²-tests, logistic regression, ANOVA and ROC analyses to assess the power of the SDS in detecting DSM-IV dependence, were used.

Results

Of 119 participants, 63 had MOH, 24 chronic headache without medication overuse and 32 patients were non headache controls.

58% of MOH patients and 12% of non-MOH patients fulfilled DSM-IV dependence criteria. SDS significantly predicted substance dependence (OR 1.9, p<0.001). SDS scores and proportion of dependence varied according to type of overused medication but high proportions of dependence were found also for peripherally acting medications.

Conclusions

The results, in addition to the previously demonstrated treatment success, justify the use of behavioural approaches developed for dependence in MOH treatment.

SOMATOSENSORY DYSFUNCTIONS IN PATIENTS WITH CHRONIC PRURITUS

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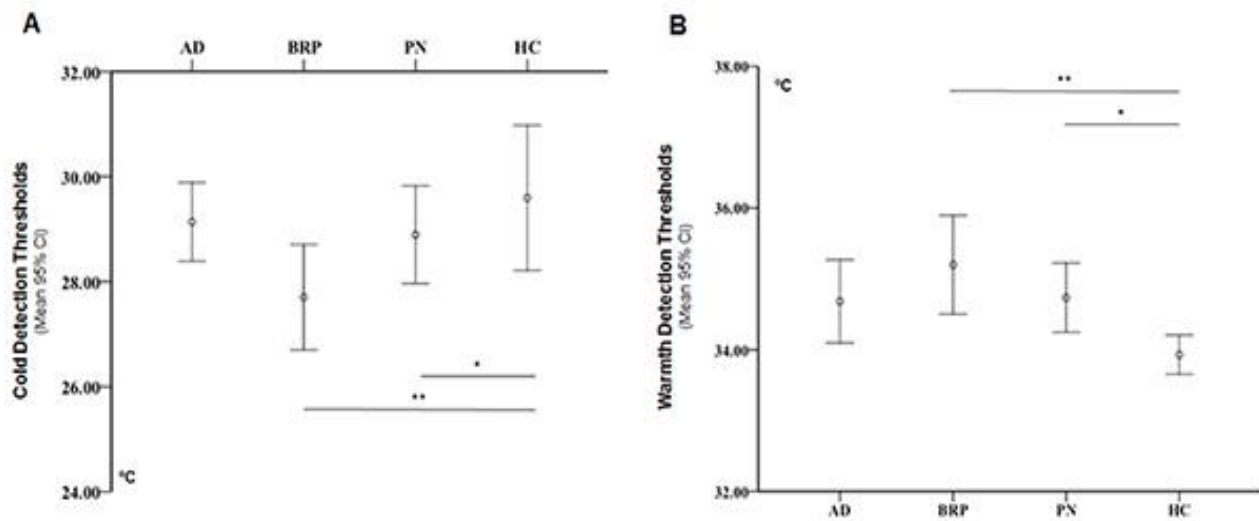
Background and aims: Neurological cutaneous mechanisms contributing to chronic pruritus are not yet elucidated. Aim of the study was to investigate sensitization of peripheral sensory fibers and signs of central sensitization and disinhibition in patients with different forms of chronic pruritus.

Methods: Eighty patients (atopic dermatitis (AD): n=28; brachioradial pruritus (BRP): n=23; prurigo nodularis (PN): n=29) and 15 healthy controls were assessed by standardized quantitative sensory testing (Rolke et al 2006). Intraepidermal nerve fiber density (IENF; PGP-9.5 staining) was assessed in 40 patients and 10 controls and descending inhibition (test-stimulus: contact heat; conditioning-stimulus: 10°C water-bath) in 22 patients and 4 controls.

Results: BRP and PN patients showed increased cold (BRP: $p<0.01$; PN: $p=0.04$) and warmth detection thresholds (BRP: $p<0.01$; PN: $p=0.01$) compared to controls (Fig. 1). BRP patients additionally showed decreased vibration detection thresholds ($p<0.01$). IENF density was reduced in all patient groups compared to controls ($p<0.05$) and correlated significantly with cold ($p=0.02$) and warmth detection thresholds ($p<0.01$). Descending inhibition was decreased in AD patients (n=6) compared to controls (n=4; $p=0.03$).

Conclusions: Loss in IENF density together with an increase in cold and warmth detection thresholds in BRP and PN patients suggests a role for Adelta- and C-fibers in chronic itch. An additional involvement of large fibers might be present in the pathogenesis of chronic pruritus in BRP patients. Reduced descending inhibition may contribute to the somatosensory dysfunctions in AD.

Fig. 1. Cold (A) and warmth (B) detection thresholds in chronic pruritus patients and healthy controls (HC). Mean $\pm$ 95%CI. * $p<0.05$; ** $p<0.01$



THE TRPA1-AGONIST TRANS-CINNAMALDEHYDE AS A HISTAMINE-INDEPENDENT HUMAN SURROGATE MODEL OF ITCH

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Background and aims: Transient receptor potential cation-channel A1 (TRPA1) has an essential role in conveying histamine-independent itch. The TRPA1-agonist trans-cinnamaldehyde (CA) 10% has been shown to induce burning pain, neurogenic inflammation and heat hyperalgesia. However, CA has not been assessed for its pruritogenic effects in humans. This study aimed to explore the applicability of topical CA as a human surrogate model of itch and itch-associated dysesthesias and to investigate if the responses were histamine-independent.

Methods: In a single-blinded, randomized study, 24 healthy volunteers (12 males, 12 females) were recruited and pruritic effects of topical CA 5% and vehicle (applied to the volar forearms) were studied. Itch spatiality, intensity (VAS₀₋₁₀), hyperknesis to pin prick, alloknesis to von Frey, neurogenic flare (laser-speckle) and focal temperature (infrared thermography) were assessed.

Results: CA (but not the vehicle) evoked an itch sensation (average peak 5.18) in 21/24 subjects and induced hyperknesis and alloknesis ($P < 0.01$). Both superficial blood flow and skin temperature were elevated in the primary and secondary area of CA application ($P < 0.01$). No gender effect was found. In a sub sample ($n=6$), pretreatment with a topical antihistamine (5% doxepin) could not reverse CA-induced itch and vasomotor responses, while it largely eliminated histamine-induced itch in the same individuals.

Conclusions: Topical CA proved feasible as a novel human model of itch. Although CA-induced axon-reflex-flare, resembled histaminergic vasomotor response, no wheals occurred and the effects of CA did no respond to topical anti-histamine suggesting the CA itch model relies on the histamine-independent pathway of itch.

EFIC5-0154

Basic Science (Anatomy/physiology/pharmacology/behaviour): Peripheral sensitization

THE NYSTAGMOID EYE MOVEMENTS AND EVOKED POTENTIALS AS OBJECTIVE INDICATORS OF SENSORY PERCEPTION INCLUDING PAIN

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Aim: The main aim is to distinguish of comparative common objective features for sensations of different modalities including post-stimulus pain in wakeful and sleeping subjects with the help of polygraphy and focused ultrasound.

Methods: Threshold and near threshold sensations with some polygraph reactions by adequate stimuli and 1-5 ms focused ultrasound, frequency 2.5 MHz were reiterated. Focused ultrasound was directed to the hand finger pads of 68 different age volunteers, male and female.

Results: The characteristics of evoked potentials after adequate and ultrasound different kinds of stimulation have been obtained by polygraphy including electroencephalogram, electrocardiogram, breath and nystagmoid eye movements. Common indices of sensory stimulation such as latency, amplitude, duration of answers have been shown in sleeping and wakeful subjects excluding pain. Polygraph pain reactions were registrated in awakening only.

Conclusions: The evoked potentials have the same latency on the electroencephalogram as nystagmoid eye movements. Pain potentials and pain nystagmoid eye movements are registrated in awake only. It has been confirmed the leading role of brain cortex for pain origin. The research of nystagmoid eye movements is rather perspective as the objective indicator of sensory perception.

SALIENCY OF BLOOD-NERVE BARRIER DISRUPTION IN PERIPHERAL NEUROINFLAMMATION AND PAINFUL NEUROPATHIES

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Background: Changes in nerve microenvironment and local inflammation resulting from peripheral nerve injury participate in nerve sensitization and neuropathic pain development. Taking part in these early changes, disruption of the blood-nerve barrier (BNB) allows for infiltration of immunocytes, and promotes the neuroinflammation. However, molecular mechanisms engaged in vascular endothelial cells dysfunction and BNB alteration remain unclear.

Methods: *In vivo*, BNB permeability was assessed following chronic constriction injury (CCI) of the sciatic nerve and differential expression of markers of endothelial cell functional state, inflammation and intracellular signaling was followed from 3 h to 2 months post-injury. Several mechanisms potentially involved in functional alterations of endothelial cells were evaluated *in vitro* using human vascular endothelial cells (hCMEC/D3), then confronted to *in vivo* physiopathological conditions.

Results: CCI of the sciatic nerve led to a rapid disruption of endoneurial vascular barrier that was correlated to decreased production of endothelial tight-junction proteins and an early and sustained alteration of Sonic Hedgehog (SHH) signaling pathway. *In vitro*, activation of TLR4 receptors in endothelial cells downregulated the components of SHH pathway and altered the endothelial functional state. Inhibition of SHH signaling in the sciatic nerve of naïve rats, mimicked the biochemical and functional alterations observed after CCI and was sufficient to evoke local neuroinflammation.

Conclusion: Alteration of the SHH signaling pathway in vascular endothelial cells, associated with peripheral nerve injury, is involved in BNB disruption and local inflammation, and could thus participate in the very early changes leading to the peripheral nerve sensitization and, ultimately, pain development.

EFIC5-0440

Basic Science (Anatomy/physiology/pharmacology/behaviour): Peripheral sensitization

A RANDOMIZED, DOUBLE BLIND, POSITIVE-CONTROLLED, THREE-WAY CROSS-OVER HUMAN EXPERIMENTAL BIOMARKER STUDY OF A TRPV1-ANTAGONIST IN HEALTHY VOLUNTEERS

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Background and aim

TRPV1 is a pain origination point on sensory nerves, and antagonists of TRPV1 are expected to prevent pain by silencing receptors where pain is generated. TRPV1 is primarily localized on peripheral sensory neurons and is up-regulated in inflammation. The present proof-of-concept study aimed to profile the a novel TRPV1 antagonist (V116517) in healthy volunteers by using quantitative pain biomarkers (thresholds, stimulus-response functions) in normal, UVB inflamed, and capsaicin sensitized skin.

Methods

32 male, healthy volunteers participated. They received in randomized order 600 mg p.o. of V116517, 400 mg p.o. Celecoxib (COX-II-inhibitor) and placebo. Skin areas were sensitized by UVB irradiation and by topical capsaicin and the heat pain thresholds (detection and tolerance) and mechanical pain responses (pressure pain threshold, stimulus response to pinprick) were assessed from the hyperalgesic areas.

Results

Heat pain threshold and the heat pain tolerance threshold assessed in the primary hyperalgesic skin after topical capsaicin were significantly reduced ($p = 0.0044$, $p < 0.0001$ respectively). Celecoxib significantly reduced the pressure pain threshold in the UVB sensitized area as compared with placebo ($p = 0.01$). Both drugs reduced the pinprick responses to 25, 50, and 80 g stimulation. None of the drugs changed body core temperature, and no side effects were reported.

Conclusions

The TRPV1-antagonists and the COX-II-inhibitor showed different anti-hyperalgesic profiles indicating different clinical applications. The TPV1-antagonists were found to be both potent and safe.

EFIC5-0507

Basic Science (Anatomy/physiology/pharmacology/behaviour): Peripheral sensitization

CHANGES IN P2X3 AND P2X7 RECEPTORS EXPRESSION IN DORSAL ROOT GANGLIA OF MONOARTHRITIC RATS

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Background and aims: Satellite glial cells (SGCs) that envelope the cell bodies of the primary afferent neurons in dorsal root ganglia (DRG) are greatly affected by nerve damage and inflammation, undergoing activation and proliferation. They are strongly implicated in chronic pain processing in sensory ganglia by mediating important neuron-glia cross-talk mechanisms. Some of most relevant receptors implicated in this cross-talk in DRGs are the P2X3R, specifically expressed in neurons, and P2X7, only expressed in SGCs. We have previously shown that SGCs are activated and proliferate in DRGs of Monoarthritic (MA) rats, a model of joint inflammation. Here, we evaluated changes in the expression levels of P2X3R and P2X7R in the DRGs of MA animals.

Methods: MA was induced by complete Freund's adjuvant (CFA) injection in the rat tibiotarsal joint. Paraformaldehyde-fixed ipsi- and contralateral L5 DRGs from 4, 7, 14 days MA rats were used for immunohistochemistry (IHC) against P2X3R. For Western Blot (WB) analysis of P2X7R the L4+L5 ipsi and contralateral DRGs were freshly harvested.

Results: The number of P2X3R-positive neurons decreased, being significantly different from controls at 14d of MA. P2X7R levels increased ipsilaterally at 4d and in both the ipsi- and contralateral DRGs at 7 and 14d of MA. Here ANOVA showed overall significance, but group differences were not reached.

Conclusions: Data is in accordance with findings in other pain models showing P2X7R activation in SGCs and a negative control over P2X3R neuronal expression, suggesting that neuron-glia communication might be mediated in part by purinergic receptors during MA.

SATELLITE GLIAL CELLS IN TRIGEMINAL GANGLIA CULTURES PRESENT ELEVATED GAP JUNCTION MEDIATED DYE-COUPLING IN RESPONSE TO OXALIPLATIN

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Background and aims: It is becoming clear that satellite glial cells (SGCs) of sensory ganglia might contribute to neuropathic or inflammatory nociception and pain. Augmented communication among SGCs in the dorsal root ganglia of mice has been observed in a model of chemotherapy-induced pain, where the administration of gap junction blockers reduced behavioral responses to mechanical stimulation in treated animals. We examined the effects of oxaliplatin and carbenoxolone on gap junction-mediated coupling among cultured SGCs of mice trigeminal ganglia to investigate the potential effect of oxaliplatin in sensory ganglia.

Methods: Primary cultures of mouse trigeminal ganglia were prepared. Experiments were conducted 24-48 h after cell isolation. SGCs were injected with Lucifer yellow following 2 h preincubation in the presence or absence of oxaliplatin (60 μ M) to investigate any alteration in coupling. Carbenoxolone (100 μ M) was added to show that the observed dye coupling was mediated by gap junctions.

Results: Dye coupling between adjacent SGCs was significantly increased (2.3-fold, $P < 0.05$) following 2 h incubation with oxaliplatin. Adding carbenoxolone to the oxaliplatin-treated cultures reversed oxaliplatin-evoked coupling to baseline levels ($P < 0.05$).

Conclusion: Our findings demonstrated that oxaliplatin increases coupling between SGCs in primary culture of mice trigeminal ganglia. Attenuation of the coupling by carbenoxolone indicated that the observed dye coupling is mediated through gap junctions. Increased gap junction mediated coupling between SGCs has been linked to hyperexcitability of sensory neurons and may contribute to chronic pain. Further investigation is required to confirm whether gap junction inhibitors are useful for chronic pain management.

LIPOPOLYSACCHARIDE FROM PORPHYROMONAS GINGIVALIS CAN DIRECTLY ACTIVATE SENSORY NEURONES

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Introduction

There is evidence that bacterial toxins can activate neurones and have the potential to sensitise peripheral and central neurones. However, to date the mechanisms by which these toxins can influence neuronal activity are poorly understood.

Aims

To determine whether trigeminal neurones are directly activated by lipopolysaccharide (LPS) isolated from an endodontic pathogen, *Porphyromonas gingivalis* (*P. gingivalis*) and correlate responses to LPS with activation by the TRPA1 and TRPV1 agonists, cinnamaldehyde (CA) and capsaicin (CAP) respectively.

Methods

Mouse trigeminal ganglia cells were cultured in vitro for 2 days. Their response to 20 µg/mL *P. gingivalis* LPS, 100 µM CA, and 1 µM CAP was assessed by calcium-imaging using Cal-520 AM. The fluorescence intensities of multiple resting cells and those stimulated by *P. gingivalis* LPS, CA, CAP, and KCl were measured over time.

Results

P. gingivalis LPS stimulation resulted in more than 20% of trigeminal neurones showing a calcium response. 13% of neurones responded to CA and 18% to CAP. The overlap between LPS and CA sensitivity was 67% and between that of LPS and CAP was 63%. Approximately 40% of the non-neuronal cells present, such as satellite glial cells and Schwann cells, responded more rapidly to LPS than these neurones.

Conclusions

These data suggest that direct activation of neurones by LPS may contribute to pain processing. Additionally, it is possible that non-neuronal cells are also involved in indirect neuronal responses to LPS, supporting a role for glial cells in bacterial-induced activation.

THE ANTIHYPERALGIC EFFECT OF NIMODIPINE IN A PACLITAXEL PERIPHERAL NEUROPATHY MODEL IN RATS

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Background and aims: Preclinical data suggests a major role of calcium channels in neuropathic pain signaling. The aim of this study is to explore the effect of nimodipine in a model of neuropathic pain induced by paclitaxel in rats.

Methods: The research was conducted using white male Wistar rats weighing 250-350 grams, divided into groups of 10 rats each. Neuropathic pain was induced by the administration of 2 mg/kg bw paclitaxel i.p, for 4 days consecutively. Nimodipine was given in doses of 30, 45 and 60 mg/kg bw, daily, for 23 days, starting simultaneously with paclitaxel administration. Gabapentin 300 mg/kg bw served as a positive control. We evaluated the response to painful stimuli by using the up-and-down method of applying von Frey filaments (mechanical allodynia) and the Dynamic Plantar Aesthesiometer (Ugo Basile) (mechanical hyperalgesia). We also recorded motor activity with the Activity Cage apparatus (Ugo Basile). Testing was carried out previous to paclitaxel administration and on day 4, 10, and 17 and 24 after the first paclitaxel dose, revealing the curative and prophylactic potential of nimodipine.

Results: Using nimodipine as a treatment for neuropathic pain decreased sensitivity towards painful mechanical stimuli, without emphasizing a dose-effect correlation for the antihyperalgesic effect of this calcium channel blocker. Motor activity decreased in the nimodipine groups, without statistical relevance, in comparison with the witness, paclitaxel, or gabapentin groups. **Conclusions:** Further pharmacological research (using other experimental methods) will establish the efficacy of nimodipine in the treatment of neuropathic pain.

NUCLEAR FACTOR KAPPA B ACTIVATION AND PAIN IN EXPERIMENTAL OSTEOARTHRITIS

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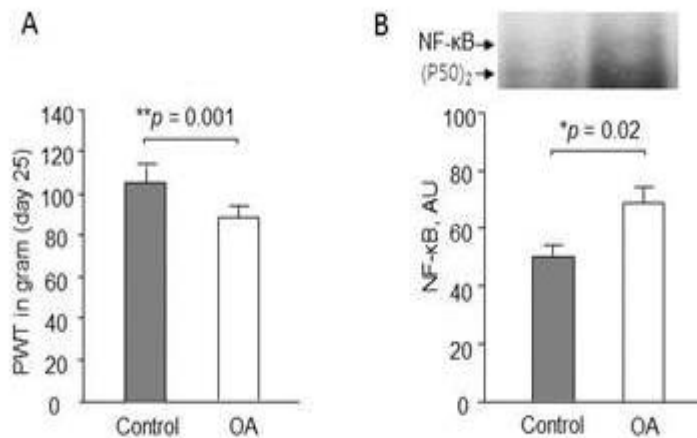
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Background. Osteoarthritis (OA) is chronic inflammatory joint disease resulting in pain and loss of joint function. Nuclear factor kappa B (NF- κ B) is involved in wide range of inflammatory disorders including inflammatory joint diseases. However, role of NF- κ B in OA pain and disease progression is not studied. The aim of this study was to analyse role of NF- κ B on pain and joint destruction in OA.

Methods. OA in rats was induced by intra-articular injection of monosodium iodoacetate (MIA) in knee joints. Pain behavior was evaluated by hind paw withdrawal thresholds (PWT) and arthritic changes were assessed by radiology and histological analysis of knee joint. Activation of NF- κ B in inflamed synovia was measured by the electrophoretic mobility shift assay.

Results. Rats with MIA induced OA showed significantly reduced pain threshold compared to control rats (Figure 1 A) at day 25 post MIA injection. Radiographic analysis indicated loss of joint space, subchondral sclerosis and osteophyte formation in tibial and femoral condyles. Histological analysis revealed synovial hypertrophy with inflammatory cell infiltration in MIA induced knee joint. The DNA-binding activity of NF- κ B in knee joint synovia was significantly increased in MIA induced OA compared to control rats (Figure 1 B).



Conclusion. The rats with MIA induced knee joint OA showing increased pain behaviour and joint destruction were associated with significant activation of NF- κ B in synovia. Our results suggest that NF- κ B may be involved in nociceptive and inflammatory processes in OA. Therapies targeting NF- κ B can be effective in mitigating pain and disease progression in OA.

ADDITIVE EFFECT OF PREGABALIN ON ACUTE EXPERIMENTAL PAIN

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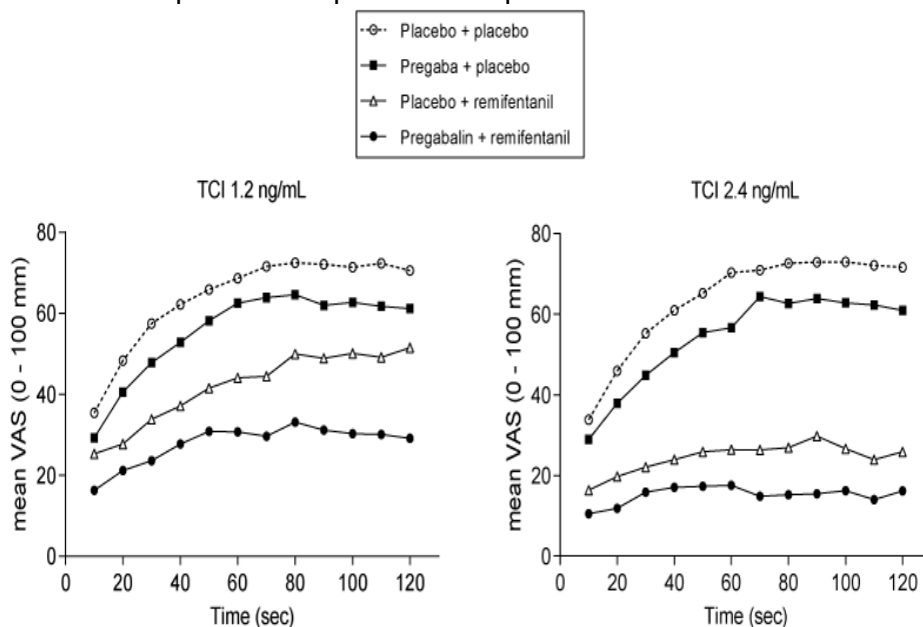
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Background and aims: Pregabalin is widely used for acute postoperative pain treatment. We explored the effects of pregabalin, remifentanyl and their combination on acute experimental pain.

Methods: Twelve volunteers were administered the following in a randomized, double-blinded complete crossover study: 1) pregabalin + placebo 2) placebo + remifentanyl 3) pregabalin + remifentanyl, 4) placebo + placebo. Pregabalin 150 mg or placebo was administered 13 and 1 h before the study started. After baseline measurements, remifentanyl or placebo was infused as target controlled infusion (effect-site TCI) of 0.6, 1.2 and 2.4 ng/mL. Pain during cold pressor test (CPT) was scored at all dose levels on a visual analogue scale (0-100 mm).

Results: Pain during CPT separated significantly for all treatments during all TCI-levels. Pretreatment with pregabalin gave significant analgesic effect compared with placebo ($P < 0.001$). Remifentanyl had a significant dose-dependent analgesic effect. By combining remifentanyl with pregabalin, the analgesic efficacy was markedly enhanced compared with remifentanyl alone ($P < 0.001$), and comparable analgesia was achieved with an approximately 50% reduction in remifentanyl dose.

Conclusions: Pregabalin had a significant analgesic effect on acute cold pressor pain compared with placebo and an additive analgesic effect when combined with remifentanyl. The findings support the view that pregabalin may have beneficial effects in the management of severe acute pain when opioids are required.



**THERAPEUTIC TOUCH TM IN A GERIATRIC PALLIATIVE CARE UNIT - A
RETROSPECTIVE REVIEW**

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Introduction: Complementary therapies are increasingly used in palliative care as an adjunct to the standard management of symptoms to achieve an overall well-being for patients with malignant and non-malignant terminal illnesses. A Therapeutic Touch Program was introduced to a geriatric Palliative Care Unit in October 2010. Two volunteer Therapeutic Touch Practitioners offer the therapy to patients who have given verbal consent.

Objective: To conduct a retrospective review of Therapeutic Touch services provided to patients in an in-patient geriatric palliative care unit to better understand the impact of the Therapeutic Touch Program on patient care.

Methods: A retrospective medical chart review was conducted on both patients who received Therapeutic Touch as well as a random selection of patients who did not receive Therapeutic Touch. Client characteristics and the Therapeutic Touch Practitioners' observations of the patient's response were collected. Descriptive analyses were conducted on all variables.

Results: Patients who did not receive Therapeutic Touch tended to have lower admitting Palliative Performance Scale scores, shorter length of stay and were older. Based on the responses provided by patients and observed by Therapeutic Touch practitioner the majority of patients receiving treatment achieved a state of relaxation or sleep.

Conclusions: The results of our chart review suggest beneficial effects for significant numbers of participants and deserve a more robust comparison study in future. Recommendations also include revising the program procedures to improve processes and documentation, and ensure all or most patients are offered the therapy.

RELATIONSHIPS BETWEEN INTEROCEPTIVE SENSITIVITY AND PAIN PERCEPTION IN MEN AND WOMEN

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Background and aims. Interoception is related to the internal processing of signals from the body in the CNS. Increased or decreased sensitivity to interoceptive signals may be reflected in increased or decreased sensitivity to exteroceptive signals. The aim of present study was to examine gender differences in relationships between interoceptive sensitivity (IS) and nociception.

Methods. In 56 healthy subjects (28 women, 28 men, age 22 years), pain threshold latencies on radiant heat stimuli and mechanical stimuli were measured on fingers of both hands. IS expressed as accuracy of estimation of heart rate frequency was calculated according to formula: $IS = 1/3 \sum (1 - |\text{real number of beats} - \text{estimated number of beats}| / \text{real number of beats})$.

Results. Women had a lower heat pain threshold ($p < 0.00001$) and mechanical pain threshold ($p < 0.00001$) than men, but they did not differ in interoceptive sensitivity ($p = 0.34$). In women, correlations between IS and thermal as well as mechanical thresholds were negative but nonsignificant ($r = -0.30$, $p = 0.12$; $r = -0.29$, $p = 0.14$, respectively). In men, both correlations were also nonsignificant ($r = 0.23$, $p = 0.22$; $r = -0.01$, $p = 0.96$). Using a modified index of IS reflecting heart rate overestimation or underestimation showed a significant negative correlation between mechanical pain and IS, but only in men ($r = -0.65$, $p = 0.0002$).

Conclusions. Using the classical estimation of IS, we did not prove significant relationship between interoceptive and nociceptive sensitivity in either men or women. However, with respect to the heart rate overestimation or underestimation, we found that men who more overestimated their heart rate were more sensitive to mechanical pain.

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EFIC5-0063

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

IMMUNE MECHANISMS OF NEUROPATHIC PAIN: ROLE OF ANTIBODIES TO GABA AND TO GLUTAMATE

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Aim of investigation. Autoantibodies to neurotransmitters and their receptors are found in various neurological diseases. Data on the participation of antibodies to neurotransmitters in the pathogenesis of neuropathic pain are absent. The aim of the present study is to examine the role of antibodies to neurotransmitters GABA and glutamate in the pathogenesis of neuropathic pain.

Methods. Experiments were performed on male Wistar rats. A model of peripheral neuropathic pain was induced by sciatic nerve injury. A model of central neuropathic pain was induced by intrathecal introduction of penicillin causing disturbance of GABAergic inhibition. Autoantibodies to GABA and glutamate were identified by ELISA. Antibodies to neurotransmitters were administered intraperitoneally or intrathecally. 0.9% NaCl or γ -globulin were administered to control animals.

Results. The development of neuropathic pain syndrome in animals induces production of autoantibodies to GABA and glutamate. Unilateral application of antibodies to GABA onto the dorsal surface of the lumbar spinal cord of rats causes tactile allodynia on the side application. Intrathecal administration of antibodies to glutamate in rats with central neuropathic pain reduces spontaneous pain attacks, but no allodynia. 0.9% NaCl or γ -globulin do not affect on nociception.

Conclusions. Our findings suggest that autoimmune mechanisms are involved in the pathogenesis of neuropathic pain. Antibodies to GABA have a pronociceptive effect and antibodies to glutamate have an antinociceptive effect.

EFIC5-0091

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

ESTIMATION OF BRAIN DYNAMICAL SYSTEMS IN ADOLESCENTS WITH TENSION-TYPE HEADACHE BASED ON NONLINEAR MULTIDIMENSIONAL ANALYSIS (DETERMINISTIC CHAOS) EEG

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Background. The life prevalence of tension-type headache in the general population by various studies ranged from 30 to 78%, and in the children – 28,7%-72,8%. Assumed, that the peripheral and central mechanisms underlying tension headaches.

Aim. Examine the condition of nonspecific cerebral regulatory systems based on the study of bioelectrical brain activity using the method of nonlinear multidimensional analysis (deterministic chaos) EEG in adolescents with episodic and chronic tension-type headache.

Methods. 45 adolescents (ages 13-18) with tension-type headache were examined. Two groups: 1st (25 pers.) - patients with episodic tension-type headache, 2nd (20 pers.)-patients with chronic tension-type headache were formed. Estimation of brain dynamical systems in these patients during background activity and **in the condition of mental stress** (countdown in mind in 1000, 993, 986, etc.) was studied by the nonlinear multidimensional analysis (deterministic chaos) EEG (calculated Kolmogorov-Sinai entropy).

Results. Value Kolmogorov-Sinai entropy decrease simultaneously with the increase in the frequency of tension headaches, i.e. the transformation of the disease into chronic form. This means reducing the number of active concurrent functional processes in the brain, reducing the possibility of self-organization, ability to form ordered adaptive dissipative structures, reducing the neuroplasticity of the brain and the ability to adapt. Be noted, that patients with chronic headache had high levels of depression.

Conclusions. Study of the Kolmogorov-Sinai entropy is an objective quantitative measure of neurodynamic characteristics of cortical and limbic-reticular structures of the brain that are involved in the formation of adaptive processes in patients with episodic and chronic tension-type headache.

EFIC5-0187

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

THE IMPACT OF SPINAL LONG TERM POTENTIATION ON THALAMO-CORTICAL NOCICEPTIVE PROCESSING

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Background: Spinal long-term potentiation (S-LTP) elicited by noxious stimulation enhances the responsiveness of dorsal horn neurons to their normal input and represent a likely mechanism of central sensitization. We investigated the impact of S-LTP on the responsiveness of posterior triangular thalamic nucleus (Pot) neurons that convey nociceptive information from dorsal horn superficial laminae to the insular cortex.

Methods: Pot recordings were performed in anesthetized rats. The impact of S-LTP triggered by high-frequency electrical stimulation of the sciatic nerve was evaluated on PoT responses elicited by graded thermal stimulation applied on their receptive fields located either on the hind- or forepaws.

Results: S-LTP increased specifically heat-evoked responses of Pot cells elicited from the hind-paws. Such responses were facilitated only within noxious ranges following S-LTP and these increases outlasted for 1 hour. In contrast, we observed a long-lasting inhibitory effect of LTP elicited by stimulation of the sciatic nerve, on heat-evoked responses of PoT cells with receptive fields located on the forepaws.

Conclusions: Several plasticity phenomena, probably implicated in central sensitization, are elicited by S-LTP. Such mechanisms not only depend on the activation of the peripheral nociceptors but also on endogenous descending modulation mechanisms acting at thalamic and/or pre-thalamic levels.

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**CLINICAL RELEVANCE OF DYNAMIC AND STATIC MECHANICAL
HYPERALGESIA/ALLODYNIA IN NEUROPATHIC PAIN PATIENTS**

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Introduction: Mechanical hyperalgesia/allodynia is characteristic for neuropathic pain.

Aim: To analyse presence of mechanical hyperalgesia/allodynia in neuropathic pain patients.

Methods: 617 patients suffering from different etiologies of neuropathic pain were investigated with QST (protocol of the German Research Network on Neuropathic Pain).

Results: Sensory gain in at least one of the four signs testing mechanical pain sensitivity (mechanical pain threshold, mechanical pain sensitivity, pressure pain threshold, dynamic mechanical allodynia) was present in 379 (61.4%) patients. Although a positive correlation between the 4 QST parameters was observed, 172 patients (27.9%) demonstrated abnormal sensory gain in only one and only 25 (4%) showed gain in all four parameters. Blunt pressure hyperalgesia (BPH) was the most frequent mechanical hyperalgesia, followed by pinprick hyperalgesia (PH) and DMA. Pairwise combinations of DMA with PH or BPH were less frequent than without. Different patterns of mechanical hyperalgesia/allodynia were observed in the different entities. Patients with DMA in CRPS and PNP had a stronger loss of mechanical detection compared to those without, whereas in contrast, in patients with PNI, patients with DMA showed less loss of mechanical detection compared to those without. Patients with PH or BPH had preserved thermal and mechanical detection and demonstrated thermal and mechanical hyperalgesia compared to those without.

Conclusion: Different kinds of mechanical hyperalgesia/allodynia occur independent of each other. Different underlying mechanisms seem to play a role in DMA and intact Aβ fibers are not necessarily required. Regarding presence of PH/BPH, intact Aδ- and C-fibers, respectively, are required and peripheral sensitization has a contribution.

LACK OF EVIDENCE FOR CENTRAL SENSITIZATION IN CHRONIC IDIOPATHIC, NON-TRAUMATIC NECK PAIN: A SYSTEMATIC REVIEW

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Background and aims: Chronic neck pain (NP) is a common, but poorly understood problem. Often no underlying structural pathology can be found and radiological imaging findings are more related to age than to a patients' symptoms. Additionally, almost 50% of all NP patients show moderate long-term disability. Central sensitization (CS) is defined as "an amplification of neural signaling within the central nervous system that elicits pain hypersensitivity". There is increasing evidence for involvement of CS in many chronic pain conditions, like chronic traumatic NP (whiplash). However, the majority of chronic idiopathic NP patients are unrelated to a traumatic injury (i.e. chronic idiopathic non-traumatic NP). The aim of this article was to review existing scientific literature on the role of CS in chronic idiopathic, non-traumatic NP.

Methods: A systematic search of literature was performed via several scientific, electronic databases. Articles were included when: (1) subjects were human adults (>18years) diagnosed with chronic idiopathic, non-traumatic NP; (2) they were reporting outcomes of CS, (3) they were full-text reports or original research.

Results: Six articles (case-control studies) were found eligible after screening title, abstract and full text for in- and exclusion criteria. Overall, results regarding the presence of CS were divergent. Available evidence suggests that CS is not a major characteristic of chronic idiopathic, non-traumatic NP.

Conclusions: Literature about CS in chronic idiopathic, non-traumatic NP is rare and provides an inconclusive message. CS is not a characteristic feature of chronic idiopathic, non-traumatic NP, but can be present in some individuals of the population.

EARLY POSTOPERATIVE HYPERALGESIA AND PAIN PREDICT CHRONIC PAIN AFTER BREAST CANCER SURGERY

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Background and aims

Chronic pain is a challenging clinical problem after breast cancer treatment (BCT). It appears related to hyperalgesia and pain during the first postoperative week, but it is unknown whether chronic pain outcome after BCT can be predicted by monitoring early hyperalgesia.

Methods

Data from a trial (N=94) studying the impact of perioperative COX-2 inhibition on pain after BCT were used. Hyperalgesia (pressure pain tolerance thresholds in dermatomes C6/T4/L1) and clinical pain at rest or on movement (100 mm VAS scale) were measured prior to and 5 days after surgery. The sum of pain tolerance thresholds (SOT) was calculated as a proxy for sensitization. Chronic pain was defined as persistent pain (VAS>30) 12 months after surgery. A logistic regression model was used to determine risk factors for development of chronic pain. Included variables were: perioperative COX-2 inhibition, age, surgery type (mastectomy vs. lumpectomy), axillary lymph node dissection, reoperation, SOT change (day 5 vs. preoperatively) and clinical pain at day 5.

Results

Eleven patients (12%) developed chronic pain. Change in SOT and pain on movement 5 days postoperatively were identified as independent risk factors for chronic postoperative pain ($p=0.048$ and $p=0.026$, respectively). A 10% decrease in SOT was associated with a 1.5 OR (95%-CI:1.0-2.2) and a 1 mm increase in VAS with a 1.1 OR (95%-CI:1.0 -1.1) (Figures 1,2).

Conclusions

Hyperalgesia early after surgery predicts chronic pain after BCT. Quantitative sensory testing can identify patients at risk of developing chronic pain after BCT.

Figure 1.

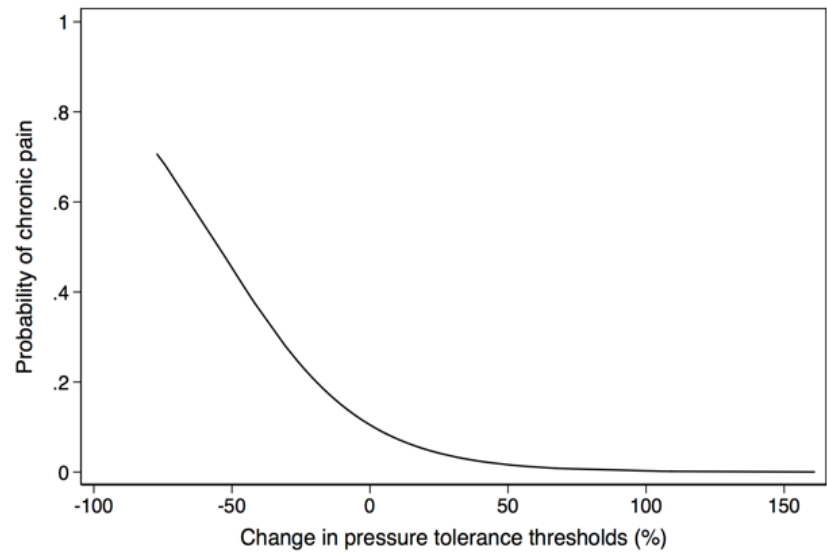
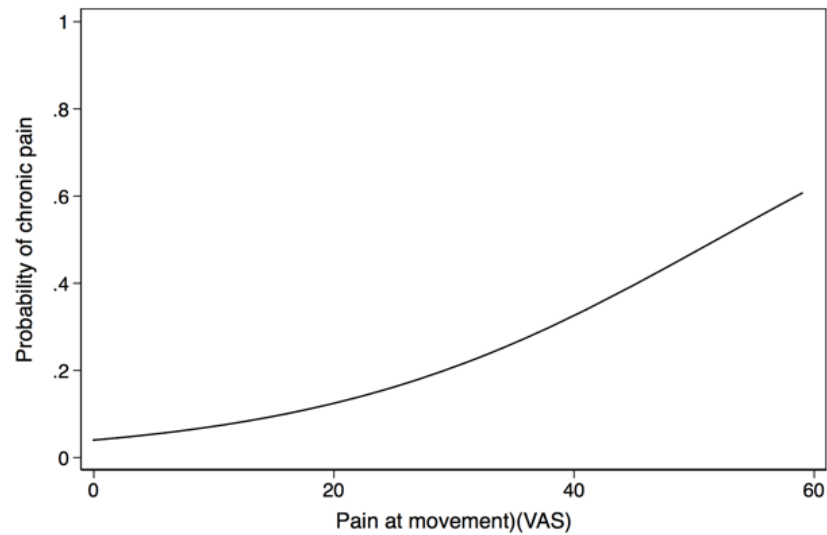


Figure 2.



THE DUTCH CENTRAL SENSITIZATION INVENTORY (CSI): FACTOR ANALYSIS, DISCRIMINATIVE POWER, AND TEST-RETEST RELIABILITY

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Background and aims: A standardized assessment of central sensitization can be performed with the Central Sensitization Inventory (CSI), an English questionnaire consisting of 25 items relating to current health symptoms. The aim of this study was to translate the CSI into Dutch, to perform a factor analysis to reveal the underlying structure, assess the discriminative power, and test-retest reliability.

Methods: The CSI was first translated into Dutch by 3 independent researchers. A factor analysis was conducted on CSI data of a group of chronic pain patients (n = 368). The ability to discriminate between chronic pain patients and healthy subjects (n = 49) and the test-retest reliability was determined in chronic pain patients (n = 36) and healthy subjects (n = 45) with a time interval of 3 weeks.

Results: The exploratory factor analysis resulted in a 4-factor model based on 20 items, representing the domains 'General disability and physical symptoms' (Cronbach's $\alpha = .80$), 'Higher central sensitivity' (Cronbach's $\alpha = .78$), 'Urological and dermatological symptoms' (Cronbach's $\alpha = .60$), and 'Emotional distress' (Cronbach's $\alpha = .80$.) Chronic pain patients scored significantly worse on all four factors. Test-retest reliability showed excellent values in both chronic pain patients (ICC = .88) and healthy subjects (ICC = .91).

Conclusions: The Dutch CSI revealed 4 distinguishable domains, which may be useful in setting up specific patient profiles and treatment targets. Internal consistency was shown good for the total score and 3 out of 4 domains, discriminative power was good, and test-retest reliability was excellent.

EFIC5-0386

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

ADMINISTRATION OF BOTULINUM TOXIN TYPE A ALLEVIATES INFRAORBITAL NERVE CONstriction-INDUCED MECHANICAL ALLODYNIA

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Background and aims

Recent studies have shown that infraorbital nerve constriction (IONCCI)-induced mechanical allodynia has been attenuated by administration of Botulinum neurotoxin type A (BoNT/A). However, its precise mechanism of action remains unclear. The aim of this study was to investigate the effects of BoNT/A on neuropathic orofacial pain.

Methods

Twenty four rats underwent left IONCCI, and 7 days following the procedure as the pain developed, the rats were randomly assigned to one of the three treatment groups: botulinum neurotoxin (20pg)(ION+BoNT:Low), n =8; botulinum neurotoxin (200pg)(ION+BoNT:High), n =8, or saline(ION+saline, N=8). Mechanical -allodynia and Mechano-hyperalgesia were tested at baseline and at days 7, 14, and 21 postoperatively. On the 21th days the rats were euthanized, phosphorylation of extracellular signal-regulated kinase (ERK) in trigeminal spinal subnucleus caudalis (Vc) neurons, and Vc neuronal responses to mechanical stimulation of the whisker pad skin in rats with ION-CCI were assessed with immunohistochemistries.

Results

On the 21th days, pain behavior was attenuated by BoNT (High) but not attenuated by BoNT (Low). The numbers of pERK-like immunoreactive (LI) cells in superficial laminae of Vc were significantly lower in (ION+BoNT:High) group compared to (ION+saline) group following noxious mechanical of the whisker pad skin at day 21.

Conclusions

These results suggest that intradermal injection of BoNT (High) in the area of ION innervation alleviates IONC-induced mechanical -allodynia and central nervous excitability after noxious stimulation.

EFIC5-0506

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

PINPRICK EVOKED BRAIN POTENTIALS RECORDED BEFORE AND AFTER HIGH FREQUENCY ELECTRICAL STIMULATION OF HUMAN SKIN REVEALS A POTENTIAL BRAIN CORRELATE OF SECONDARY MECHANICAL HYPERALGESIA

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Cutaneous tissue injury is often associated with the development of increased pain sensitivity in the area of actual tissue injury ("primary hyperalgesia") and in the surrounding *uninjured* skin ("secondary hyperalgesia"). A hallmark of secondary hyperalgesia is enhanced pain to mechanical nociceptive stimuli (e.g. pinprick stimuli). Using EEG, the aim of the present study was to identify brain activity related to secondary mechanical hyperalgesia. Pinprick evoked brain potentials (PEPs) and pinprick-evoked pain ratings were recorded in healthy volunteers before and after high frequency electrical stimulation of human skin (HFS). The arm contralateral to the arm that received HFS served as control. After HFS, pinprick stimuli were perceived as more intense in the area of secondary hyperalgesia (as compared to baseline and control site). In addition, there was a specific enhancement of PEP activity 400-600 ms after stimulus onset. Because the latency of this enhanced ERP activity is compatible with the conduction velocity of myelinated A δ nociceptors, we suggest that it may represent a brain correlate of secondary mechanical hyperalgesia.

EFIC5-0575

Basic Science (Anatomy/physiology/pharmacology/behaviour): Central sensitization

PVA IS IMPORTANT IN MEDIATING CHRONIC MECHANICAL HYPERALGESIA

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Background and aims

Nociceptive brain matrix is an obscure labyrinth while solving it would help chronic pain patients who build up a population at 20-25% world-wide. We previously identified Cav_{3.2} T-type Ca²⁺ channel (T-channel)-dependent ERK activation in anterior nucleus of paraventricular thalamus (PVA) modulates chronic mechanical hyperalgesia in repeated acid-induced chronic muscle pain model. However, whether PVA neurons attribute to mechanical hyperalgesia originated from other insult is unclear. This study aims to clarify the role of PVA in mechanical hyperalgesia and how nociception-dependent signaling pathways mediate PVA neuronal activity in different pain models.

Methods

Formalin-induced inflammatory pain and spared nerve injury (SNI)-induced neuropathic pain mouse models were engaged and withdrawal responds to 1-g-force was monitored. Immunostaining, electrophysiological recording and intracerebral microinfusion were conducted to dissect the nociceptive signals PVA-mediated.

Results

ERK phosphorylation, a nociceptive marker, increased in PVA in both models. In vivo electrophysiological recording further illustrates the increase of PVA neuronal activity in response to noxious stimulus in anesthetized mice. Firing pattern switches after nociceptive induction suggesting a neuronal plasticity change in PVA. Manipulation of ERK activity in PVA alters the development of mechanical hyperalgesia in these pain models and naïve mice. Furthermore, intra-PVA infusion of MK801, a NMDA receptor blocker, down regulated ERK activity and consequently alleviated SNI- and formalin-induced mechanical hyperalgesia.

Conclusions

Taken together, PVA, the locus per se, plays an important role for the development of mechanical hyperalgesia during central sensitisation, and ERK functions as a key molecule in mediating this phenomenon.

CHRONIC PAIN REDUCES INSULAR FUNCTIONAL CONNECTIVITY IN PROFESSIONAL MUSICIANS

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Background and aims: Extensive musical practice has been related to the enhanced processing of bodily information and altered cortical representation of sensory and motor systems due to the highly demanding integration of multi-sensory information. Chronic pain has also been associated with altered body awareness and extensive functional and morphological changes of the brain. Interestingly, however, approximately 80% of musicians experienced prolonged pain syndromes throughout their careers. The present study aimed at dissociating the effect of musicianship on resting-state brain connectivity as a function of chronic pain.

Methods: We examined low-frequency fluctuations of resting-state BOLD signals using the anterior insular cortex (AIC) as a seed region. Eleven professional musicians with chronic back pain, 10 pain-free musicians, 14 non-musicians with chronic back pain and 10 pain-free non-musicians participated in this study.

Results: We found a significant interaction between pain and musical training, suggesting stronger connectivity patterns in pain-free musicians and chronic pain non-musicians compared to pain-free non-musicians between AIC and right sensory cortices (postcentral gyrus, supramarginal and superior temporal gyrus, the insula and adjacent orbitofrontal cortex) as well as bilateral superior frontal gyrus, ACC, MCC and the supplementary motor area. Conversely, we found reduced connectivity between these areas in musicians with chronic pain.

Conclusions: We propose that musical practice and chronic pain can both lead to comparable changes in insula connectivity at rest. However, decreased connectivity between the insula and fronto-parietal regions in musicians with chronic pain indicates that the persistence of pain over time modulates brain activity differently in experienced musicians.

HRV AND SKIN TEMPERATURE DURING AND AFTER THE 6 MINUTE WALKING TEST: A COMPARATIVE STUDY OF FIBROMYALGIA PATIENTS AND HEALTHY CONTROLS

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Background and Aims

Literature suggests there are dysfunctions in the autonomic nervous system (ANS) of fibromyalgia patients (FM). In search for a clinical test to endorse the diagnosis we explored the ANS in FM when exposed to a stressor.

Methods

22 FM and 14 matched healthy controls (HC) were recruited. Patients fulfilled the ACR criteria for fibromyalgia (1996 and 2001). All participants completed the PainDetect and HADS questionnaires.

Temperature, blood pressure (BP), heart rate (HR), heart rate variability (HRV), body and skin temperature were examined while at rest (sitting), during a 6 minute walking test (6MWT) and during 20 minutes of recuperation.

Results

FM score higher for anxiety and depression.

At rest, FM have a significantly greater lower versus upper body temperature difference. Mean BP, systolic BP and pulse are significantly higher in FM ($p=0.021$, $p=0.003$ and $p=0.036$ respectively).

During 6MWT, walking distance ($p<0.001$) and Low Frequency (LF) % ($p=0.047$) are significantly lower in FM.

Immediately after 6MWT, difference between lower and upper body temperature remains significantly greater in FM ($p<0.05$).

During the recuperation period body temperature in FM increases more slowly, both for lower ($p=0.007$) and upper ($p=0.035$) extremities.

BP and HR show a non-significant blunted reaction during exercise and recuperation in FM.

Conclusion

FM more frequently show a blunted autonomic reaction when exposed to a stressor, i.e. the 6MWT. Further research may possibly corroborate this conclusion with more statistically significant results.

THE ROLE OF PAIN MEMORY IN LUMBOPELVIC PAIN – A PILOT STUDY

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Background: Lumbopelvic pain (LPP) following pregnancy is common but the underlying pain mechanisms are poorly understood. A previous history of LPP increases the risk for developing pain during pregnancy indicating that the pain system may become sensitized and more susceptible to nociceptive stimuli. The aim of this study was to compare the mechanical pain sensitivity, conditioned pain modulation (CPM), pain and pain referral in parous and nulliparous women.

Methods: Healthy, pain-free parous (n=12) and nulliparous women (n=15) were included in the study. Pressure pain thresholds (PPTs) were assessed in the lumbopelvic area and at the shoulders. Suprathreshold stimuli (PPT + 20%) was applied using handheld algometry to induce referred pain which was rated using a visual analogue scale (VAS) and drawn by the participants on an electronic body chart. The CPM effect was induced using cuff algometry positioned on the lower leg while PPT values from the lumbopelvic region and shoulder were registered.

Results: PPT values were comparable between the groups at all sites although the parous group demonstrated a trend towards lower values. The parous women reported lower pain on VAS after suprathreshold stimuli than the nulliparous in the lumbopelvic region and shoulder ($P < 0.05$). The parous group demonstrated a less efficient CPM effect than the nulliparous group ($P < 0.05$).

Conclusions: These pilot data indicate that parous women have a less effective ability to dampen pain than nulliparous, potentially as a result of pregnancy. This may have clinical implications with regards to management of pregnancy-related LPP and warrants further investigations.

EFFECT OF TRAZODONE ON THE SLEEP-WAKE PROFILE IN A BILATERAL MODEL OF INFLAMMATION IN THE RAT

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In humans, disturbance of sleep is one of the most common consequence of chronic pain, regardless the etiology. Trazodone is approved for the treatment of depression, but it is widely used in clinical practice for its effects on sleep.

In the present study, trazodone was evaluated for its effectiveness to improve sleep in comparison with zolpidem and diclofenac in a model of inflammatory pain.

Male adult rats were implanted for continuous recordings of electroencephalography (EEG). Inflammation was induced by bilateral plantar injection of Complete Freund's Adjuvant (CFA) and tactile allodynia was measured using a von Frey apparatus. Animals were tested for changes in the alpha/delta wave ratio, a measure of SWS depth, and in the delta waves amplitude. In animals with bilateral CFA-induced inflammatory injury, trazodone (10 mg/kg, po), zolpidem (12 mg/kg, po) or diclofenac (20 mg/kg, po) were tested to characterize their effects on injury-related sleep disturbances.

A significant and long-lasting increase of alpha/delta ratio, together with a decrease of delta waves, was observed in animals with hind paw inflammation. Trazodone and zolpidem significantly modified the alterations induced in alpha/delta ratio and delta power by bilateral paw inflammation, indicating that these agents at least partially can rectify the sleep disturbance in these animals. On the other hand, diclofenac did not display any effects on the sleep-inducing alteration.

Our study shows that pain associated with the CFA rat model causes alterations in sleep architecture and that trazodone, like zolpidem, is able to partially restore the normal architecture of the sleep.

EFFECT OF REM-SLEEP DEPRIVATION ON THE PAIN REMEMBERING IN RATS

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Backgrounds and aims: Most animal REM-sleep deprivation studies indicate heightened pain sensitivity. On the other hand, data concerning RD effect on the memory consolidation are reciprocal. Less attention has been focused on the RD technique conditions. This study was aimed to assess effect of instrumental and chemical RD on the pain remembering in rats.

Methods: 36 adult male Albino rats weighing 250-300 gram were divided in three groups (12 animals in each): Ringer Solution injected (Control), water-tank RD and amitriptyline (5 mg/kg) injected (AMI). Passive avoidance test (PA) was used to assess pain remembering following administration of corresponding compounds and replacement of rats on water-tank platforms for 48 hours. 180 sec was considered as the criterion for the pain remembering. The difference between groups was verified by Student's test.

Results: The results demonstrated that, compared with Control or AMI groups, post-training RD via water-tank produced an impairment in the retention of painful electrical stimulation (time of entrances from black to light compartment was less than 180 sec). There was no difference between AMI and Control groups; AMI had no negative effect on memory consolidation. When we allow the water-tank RD rats to realize complete sleep-wakefulness cycle in their home-cages for 6 hours, it was detected that they remember the pain as 11 rats reached 180 sec criterion in PA.

Conclusions: RD has no considerable influences on the pain remembering. Impairment in the consolidation of newly acquired memories or pain memory may be related to the stress environment of water-tank.

ROLES OF OPIOID AND ADENOSINE A₁ RECEPTORS IN VENLAFAXINE INDUCED LOCAL PERIPHERAL ANTINOCICEPTION IN RAT

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Background and aim: We found that an antidepressant drug, venlafaxine, has dose dependent antinociceptive effect when applied locally to the periphery in rat. In the present study, we aimed to determine the roles of opioid and adenosine A₁ receptors in venlafaxine induced peripheral antinociceptive actions in formalin test, a model for acute and tonic pain.

Methods: We pretreated adult male Sprague-Dawley rats (n=6) with 2 mg/kg naloxone (opioid receptor antagonist), 2 mg/kg CPT (adenosine A₁ receptor antagonist) or saline intraperitoneally before 200 µg/paw venlafaxine injection subcutaneously to the rat hind paw. After the venlafaxine or saline injection, 5 % formalin was injected subcutaneously into the same paw. Datas were expressed as number of flinches and total time for biting/licking of the injected paw over phase 1 (0–12 min) or phase 2 (16–60 min) and analyzed using the Student's t-test (mean ± S.E.M.). A p value < 0.05 was taken statistically significant.

Results: Pretreatment with naloxone diminished the effect of venlafaxine in the both phases, however, it was not statistically significant (p>0.05). Pretreatment with CPT decreased venlafaxine induced antinociception only in phase 1 for both nociceptive behaviours (p<0.05). Neither naloxone nor CPT changed formalin induced nociceptive behaviors alone (p>0.05).

Conclusions: By the local application it may be possible to reach high levels at application site and also to get rid of some systemic side effects. We need further experimental studies for to determine the roles of other possible systems such as adrenergic, serotonergic in venlafaxine induced peripheral antinociception.

DIFFERENT NEUROPATHIC PAIN SYMPTOM INVENTORY SYMPTOM PROFILES DON'T DISCRIMINATE CENTRAL AND PERIPHERAL NEUROPATHIC PAIN

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Background: Neuropathic pain (NP) is a frequent manifestation of many disorders of peripheral and central nervous system. Simple questionnaires mainly based on the presence of so called „neuropathic pain descriptors“ represent the most important screening tool in the diagnosis of this condition (especially for non-specialists) and allow to identify different symptom profiles corresponding to distinct NP phenotypes. The objective of this study was to evaluate the diagnostic validity of one of the most frequently used questionnaires (Czech version of Neuropathic Pain Symptom Inventory, NPSI_{CZ}), originally developed to characterize subtypes of NP, in the discrimination of central (CNP) and peripheral (PNP) NP and to identify and compare particular symptom profiles in well-defined groups of patients with NP of central and peripheral origin. **Methods:** Two groups of patients were examined with NPSI_{CZ} questionnaire: a group of patients with CNP in multiple sclerosis (n=30, 2 men, median age 56) and a group of individuals suffering from PNP due to diabetic polyneuropathy (n=66, 30 men, median age 62,5). ROC analysis was performed for the evaluation of diagnostic validity of NPSI_{CZ} test in the discrimination of CNP and PNP and setting the optimal cut-off values. Cluster analysis using Euclidean distance and Ward algorithm was used for the definition of clusters of patients with similar NP symptom profiles.

EFIC5-0970

Clinical pain states: Neuropathic pain

PREOPERATIVE RISK FACTORS FOR THE DEVELOPMENT OF CHRONIC POSTOPERATIVE PAIN 3-5 YEARS AFTER ROBOT-ASSISTED HYSTERECTOMY.

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Background and aim: Evidence based risk factors are relevant clinical tools for assessing the probability of developing postoperative chronic pain (POCP) after surgery. Less invasive surgical procedures have emerged as a mean to decrease postoperative pain. This study aimed to investigate the prevalence of chronic pain following robot-assisted hysterectomy (RAH) and to assess risk factors for the development of chronic pain after RAH.

Method: 200 women, who had undergone RAH for benign and malign indications at Aalborg University Hospital, were contacted. Patients with major complications, conversion to abdominal surgery, mental disorders and dementia, abdominal surgery or relapse in the operational follow-up period were excluded. Preoperative pain (PP) and POCP was the main variable measured by the Visual Analog Scale (VAS) in the issued questionnaire. Variables for risk factors were PP, preoperative pain elsewhere, previous pelvic surgery, previous caesarean section and giving birth to 2 or more children.

Results: 112 of 200 questionnaires were returned. 28 of 112 women (25.0%) experienced PP (NRS=8 [range: 2-10]) and 15 out of 112 women (13.4%) had POCP 3–5 years after RAH operation (NRS=8 [range: 2-10]). A multivariate logistic regression showed that PP (OR 4.4, CI 1.3–14.9, B = 1.48) and preoperative pain elsewhere (OR 5.1, CI 1.2–21.1, B = 1.63) increased the prevalence of POCP.

Conclusion: POCP after surgery is a neglected clinical problem. RAH has a low prevalence of POCP compared to literature and to other surgical methods, and PP is often seen as a risk factor for those developing POCP.

EFIC5-0988

Clinical pain states: Neuropathic pain

THE IMPACT OF NEUROPATHIC PAIN ON QUALITY OF LIFE, SLEEP AND MOOD

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Background and aims

Quality of Life (QoL), sleep and mood are frequently impaired in patients with NP. The aim of this cross-sectional study was investigation of patients with NP and its impact on QoL, sleep and mood.

Methods

During 2 years 62 patients (mean age 49 ± 12 years) with definite NP were selected, with Diabetic Painful Neuropathy (DPN, n=33), Post-herpetic Neuralgia (PHN, n=15), Post-stroke Pain (PSP, n=6) and Trigeminal Neuralgia (TN, n=8).

Other types of pain, such as Complex Regional Pain Syndrome or Chemotherapy-Induced NP were excluded.

Screening tools included: Visual Analog Scale (VAS), Pain Detect Questionnaire (PD), 36-Item Short Form (SF-36), Beck's Depression Inventory (BDI), Generalized Anxiety Disorder-7 (GAD-7), Sleep Scale from the Medical Outcome Studies (MOS-Sleep).

Results

QoL was affected in all patients. Mean score by VAS in all types of NP was $6,8 \pm 2$.

Severe Depression was found in 24 patients with PDN (73%) of the group, and 4 with PSP (67%) respectively. Moderate Depression: 11 with PHN (73%) and 4 with TN (50%).

Severe Anxiety: 30 patients with PDN (91%) and 6 with PSP (100%).

Moderate Anxiety: 13 with PHN (87%) and 7 with TN (88%).

MOS-sleep unveiled sleep disturbance in all patients.

Conclusions

Chronic NP directly affects the QoL.

Depression and Anxiety were severe in PDN and PSP groups, probably because of comorbide high level disability.

Depression, anxiety and sleep problems must be considered in all patients with NP for successful therapeutic management.

DIFFERENT NEUROPATHIC PAIN SYMPTOM INVENTORY SYMPTOM PROFILES DON'T DISCRIMINATE CENTRAL AND PERIPHERAL NEUROPATHIC PAIN

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Background: Neuropathic pain (NP) is a frequent manifestation of many disorders of peripheral and central nervous system. Simple questionnaires mainly based on the presence of so called „neuropathic pain descriptors“ represent the most important screening tool for NP. The objective of this study was to evaluate the diagnostic validity of one of the most frequently used questionnaires (Czech version of Neuropathic Pain Symptom Inventory, NPSIcz) and to identify and compare particular symptom profiles in well-defined groups of patients with NP.

Methods: A group of patients with CNP in multiple sclerosis (n=30, 2 men, median age 56) and a group of individuals suffering from PNP due to diabetic polyneuropathy (n=66, 30 men, median age 62,5) were examined with NPSIcz questionnaire. ROC analysis was performed for the evaluation of diagnostic validity of NPSIcz test in the discrimination of CNP and PNP and setting the optimal cut-off values. Cluster analysis was used for the definition of clusters of patients with similar NP symptom profiles.

Results: The NPSI score, partial subscores and most individual test item values shown no statistically significant differences between patients with CNP and PNP. ROC analysis confirmed low diagnostic validity of this questionnaire in the discrimination between CNP and PNP (AUC=0.540, p=0.53, sensitivity=0.66, specificity=0.47). Cluster analysis identified 6 distinct pain phenotypes with both CNP and PNP patients included in each of these symptom-based subgroups.

Conclusion: NPSI questionnaire proved only low diagnostic validity in the discrimination between central and peripheral NP. Different neuropathic pain phenotypes seem not to be etiologically-specific.

NEUROPATHIC PAIN AS A DETRIMENTAL OUTCOME AFTER SURGERY*L. Guimarães Pereira¹, F. Farinha¹, L. Azevedo², F. Abelha³, J. Castro Lopes⁴*¹Anestesiologia, Centro Hospitalar São João, Porto, Portugal²CIDES, Faculdade de Medicina da Universidade do Porto, Porto, Portugal³Anestesiologia, Centro Hospitalar São João/Faculdade de Medicina da Universidade do Porto, Porto, Portugal⁴Biologia Experimental, Faculdade de Medicina da Universidade do Porto, Porto, Portugal

Background and aims: Persistent postoperative pain (PPP) is defined as persistent pain after surgery of greater than 3 months' duration, according to IASP definition. Previous research described PPP as a potential Neuropathic Pain (NP). Our aims were to identify the incidence of NP in patients who developed PPP and assess their outcome in terms of Health Related Quality of Life (HRQoL).

Methods: Observational prospective study which included adults proposed to cardiac surgery between July and December 2013, after ethics committee approval. We applied the validated Portuguese version of Brief Pain Inventory Short Form preoperatively (T0) and 3 months later (T3). If the patient had pain at T3 and other causes of pain excluded, he was considered as having PPP. We applied the Portuguese version of Douleur Neuropathique 4 Questionnaire (DN4) to assess NP. HRQoL was measured with the Portuguese version of Duke Health Profile questionnaire (DUKE) at T3. Non-parametric tests were performed for comparisons between numerical variables.

Results: A total of 288 patients completed the study. The incidence of PPP after cardiac surgery was 43%. Fifty per cent of the patients with PPP had NP. Among patients who developed PPP, those with NP presented worse DUKE scores three months after surgery (Table 1).

Conclusions: NP in patients who developed PPP has brought worse outcome after surgery. These results emphasize the importance of NP in PPP and should constitute a warning to all involved in the treatment of postoperative pain.

Table 1 – NP and Duke Health Profile in the presence of PPP (N =124)

Duke Health Profile at 3 months ¹	Without NP M [P ₂₅ -P ₇₅]	With NP M [P ₂₅ -P ₇₅]	p *
Physical Health Score	80 [60-90]	80 [60-80]	0.039
Mental Health Score	90 [90-100]	90 [70-100]	0.012
Social Health Score	100 [100-100]	100 [90-100]	0.681
General Health Score	90 [87-93]	87 [73-90]	0.020
Perceived Health Score	100 [50-100]	50 [50-100]	< 0.001
Self-Esteem Score	100 [100-100]	100 [90-100]	0.001
Anxiety Score	8 [0-8]	8 [8-25]	0.010
Depression Score	10 [0-10]	10 [10-30]	< 0.001
Anxiety-Depression Score	7 [0-7]	7 [7-7]	0.001
Disability Score	0 [0-0]	0 [0-0]	0.98

* obtained with Mann-Whitney U test

M – Median; NP – Neuropathic Pain; P₂₅ – Percentile 25; P₇₅ – Percentile 75; PPP- Persistent Postoperative Pain

¹ For physical health, mental health, social health, general health, self-esteem, and perceived health, 100 indicates the best health status, and 0 indicates the worst health status. For anxiety, depression, anxiety-depression, pain, and disability, 100 indicates the worst health status and 0 indicates the best health status

EFIC5-1065

Clinical pain states: Neuropathic pain

NEW METHOD OF TREATMENT OF PAIN SYNDROME IN PATIENTS WITH DISTAL SYMMETRIC DIABETIC POLYNEUROPATHY.

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Background: The most common complication of diabetes mellitus is Distal Symmetric Diabetic Polyneuropathy (DSDP), accompanied by severe pain in the legs and feet.

A large number of randomized clinical trials have been conducted to assess the efficacy of various therapeutic agents but the results have been disappointing, most probably due to complexity of mechanisms involved in its pathogenesis. Therefore, till date there is no effective treatment exists for DSDP. This study was undertaken to evaluate efficacy of intraosseous blockades in painful distal symmetric diabetic polyneuropathy.

Methods: A total of 89 patients were enrolled in the study. The patients were categorized into two groups. Group I included 50 patients who were prescribed intraosseous blockades, while group II who were prescribed Amitriptyline. Both groups were matched by sex, age, duration of diabetes and neuropathic pain syndrome. Intensity of pain, assessed by using a visual analogue scale (VAS), DN4 questionnaire. Severity of DSDP was assessed, using Total Symptoms Score (TSS) and the Neuropathy Impairment Scale in the Lower Limbs.

Results: In group I it was shown pain decrease a three times and improvement of performance of TSS and NIS-LL. In group II improvement was insignificant. The results show pain relief is more effective with Intraosseous blockades administration than standard medical treatment.

Conclusion: Results of this study confirm that treatment with intraosseous blockades are highly effective in patients with DSDP.

EFIC5-1070

Clinical pain states: Neuropathic pain

PAIN IN AMYOTROPHIC LATERAL SCLEROSIS AND OTHER MOTOR-NEURON DISEASE (MND)

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Patients with MND have pain. However, pain characteristics, related mood and associated factors of MND related pain remain largely unknown. We evaluated pain characteristics and related factors in a group of MND patients.

Methods: Patients with MND underwent full neurological evaluation with specific focus on pain: DN4, Brief pain inventory (BPI), McGill pain questionnaire (MPQ), Pain Catastrophizing Scale (PCS), Hospital Anxiety Depression Scale (HADS), and the amyotrophic lateral sclerosis assessment questionnaire (ALSAQ 40).

Results: Seventy-five patients were included. Pain was present in 35 (46%). Patients with pain did not significantly differ from those without pain concerning age (53 ± 11.8 vs. 57 ± 14.2 ; $p = 0.092$), mean time from diagnosis, intensity of depressive symptoms and functional score ($p > 0.2$). Females were more frequently found in the group with pain, and anxiety symptoms were more frequent in pain MND patients ($p = 0.044$). Fifty percent of pain patients reported cervical pain and 46% lumbar pain. The mean pain intensity was 5.0 ± 2.0 . Only one patient had a positive DN4, but when the neurologic exam was performed we could not characterize his pain as neuropathic. Cramps occurred in 5.7%, spasticity with pain in 2.9%, myofascial pain syndrome in 40%, and diffuse widespread pain in 31.4%. The presence of chronic pain before diagnosis of MND was reported by 14.3% patients.

Conclusion: 46% of patients with MND have pain (more frequent in the lumbar and cervical regions). Pain and pain-free differed in the gender and anxiety levels. The intensity of pain did not correlate with more severe functional impairment or lower quality of life.

THE IMPACT OF NEUROPATHIC PAIN ON THE QUALITY OF LIFE IN PATIENTS WITH DIABETIC POLYNEUROPATHY

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Background and aim: Quality of life (QOL) is strong indicator of the healthcare system efficacy. Diabetes mellitus (DM) has high prevalence, with ascending trend in younger patients. With prolonged duration of DM, the prevalence of diabetic polyneuropathy (DPN) increases, with negative impact QOL.

Methods: Included in the study were 160 diabetic patients, divided in two cohorts, depending on the presence or absence of neuropathic pain. The third group included 40 healthy subjects, used as control. Pain was assessed by Visual analogue scale (VAS) and Leeds Assessment of Neuropathic Symptoms and Signs (LANSS). Quality of life was assessed by SF-36 (Short Form Health Survey) questionnaire.

Results: Diabetic patients with painful DPN had significantly lower values in all 8 dimensions and both summary values of the SF-36 scale compared to diabetic patients without pain. Diabetic patients without neuropathic pain had higher average values of quality of life compared to general population of Croatia in 4 of 8 dimensions. QOL results for the control group were higher than those in diabetic patients with neuropathic pain, but lower compared to diabetic patients without neuropathic pain, which was a surprising finding. The only exception was general health perception (GH), which had the highest value in controls, followed by diabetic patients without neuropathic pain and diabetic patients with neuropathic pain.

Conclusions: Painful DPN has a major negative influence on quality of life in diabetic patients. Timely diagnostic and treatment of painful DPN is a significant factor in improvement of QOL in patients with DM.

EFIC5-0110

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

ANTINOCICEPTIVE EFFECTS OF ONO-2952, A TSPO ANTAGONIST, ON MECHANICAL HYPERALGESIA IN REPEATED COLD STRESS-LOADED RATS

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The antinociceptive effect of ONO-2952 on mechanical hyperalgesia induced by repeated cold stress (RCS) in rats and possible involvement of descending inhibitory system modulation were examined. Male Crl:CD(SD) rats (5weeks) were exposed alternately to room temperature and a cold environment (2°C) at 1hour intervals from 9am to 6pm, and then to a cold environment from 6pm to 9am from Day0 to Day3, and exposed to cold environment only from 6pm to 9am from Day4 to Day10. Vehicle (0.5% methylcellulose), ONO-2952, pregabalin (twice daily), or duloxetine (once daily) were orally administered from Day4 to Day10. Withdrawal thresholds of left paw were determined by Randall-Selitto method in room temperature on Day4, Day7 and Day10 just before, 1, 2 and 5hours after first administration. ONO-2952 (1 and 10mg/kg), pregabalin (20mg/kg) and duloxetine (30mg/kg) produced significant antinociceptive effects. On the other hand, in the RCS-loaded rats treated with vehicle, ONO-2952 from Day4 to Day7, extracellular 5-HT and noradrenaline (NA) levels in the nucleus raphe magnus (NRM) were determined by microdialysis on Day7 at 2hours after administration with tail pinch stimulation. 5-HT and NA releases during tail pinch in vehicle treated RCS-loaded rats were smaller than those in non-stressed rats, but ONO-2952 tended to increase them in RCS-loaded rats. These results suggest that ONO-2952 inhibits stress-induced hyperalgesia by modulating descending inhibitory system and would be efficacious treatment for pain in irritable bowel syndrome or fibromyalgia.

EFIC5-0122

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

EXERCISE-INDUCED HYPOALGESIA AND CONDITIONED PAIN MODULATION ARE REDUCED IN PATIENTS WITH KNEE OSTEOARTHRITIS COMPARED WITH PATIENTS WITH WIDESPREAD PAIN AND HEALTHY CONTROLS

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Reduced conditioned pain modulation (CPM) and impaired exercise-induced hypoalgesia (EIH) have been demonstrated in many groups of chronic pain patients. The aim of this study was to compare CPM and EIH responses in patients with localized and widespread chronic pain.

Fifteen patients with knee osteoarthritis (OA), 50 patients with musculoskeletal pain in 3 or more body regions (WP), and 69 healthy controls (mean age: 65.7±6.0, 45.6±10.3, and 38.4±15.0 years, respectively) performed a cold pressor test on the dominant foot, a bicycling exercise, and an isometric knee extension exercise in a randomized and counterbalanced order. Before and immediately after conditioning pressure pain thresholds (PPTs) were assessed by handheld algometry on the leg, arm, and shoulder and pain tolerance (PTT) was recorded by cuff algometry on the lower leg. CPM and EIH responses were calculated as percentage difference in PPTs and PTT (post/pre). ANCOVAs with age as covariate were used for analyses on log-transformed PPTs and PTT together with the Newman-Keuls post-hoc test.

At baseline, PPTs were significantly reduced in WP and OA patients compared with healthy controls ($P<0.05$).

WP and OA patients demonstrated widespread hypersensitivity. EIH and CPM responses were reduced only in OA patients compared with healthy controls.

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EFIC5-0171

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

CGRP ASSAY AND K-OPIOID RECEPTOR ON F11 CELL LINE

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Background and aims: Calcitonin gene related peptide (CGRP) has been proposed to contribute to pain transmission and inflammation. Mu opioid receptor (MOR) is one of the endogenous opioid receptors. MOR is implicated in the antinociception of central administered CGRP, although there are still controversies. The F11 cell lines culture is an hybrid between murine neuroblastoma and rat dorsal root ganglion cells (DRG). The aim of this study is to verify the Inhibition effect on cGRP release by F11 cell culture related to 30 min 17b-estradiol exposition and verify the modification of expression of K opioid receptor on F11 cell culture related to 30 min 17b-estradiol exposition.

Methods: Step1: Undifferentiated cells growing for 48h till to the achievement on conspicuous number. Step 2: differentiation of F11 neuronal cells.

For the determination of CGRP we have utilized the EIATEST (rat test), with the sequent 17b-estradiol concentration for 30min each: 10 nM – 50 nM -100 nM- 200 nM.

By Confocal Laser Scanning Microscope we analyzed the different expression of K opioid receptor on F11 cell culture after incubation for 30 min with 17b-estradiol.

Results: cGRP release from cells changes after their exposition to different 17b-estradiol concentration.

We observed an increase of cGRP release at 100nM 17b-estradiol concentration and a decrease at 200nM 17b-estradiol concentration. This suggest that a dose superior to 100nm produce an anti-nociceptive effect. (cGRP reduction). Moreover the 30min exposition of F11 cell to 17b-estradiol don't modify the k opioid receptor expression.

EFIC5-0258

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

THE EFFECT OF ACUTE STRESS ON PAIN MODULATION OF TRIATHLETES

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Background and aims: In a previous study we found that triathletes exhibit unique pain modulation capabilities compared to controls, however the magnitude of conditioned pain modulation (CPM) was correlated negatively with the amount of perceived stress during training/competitions. Here we tested the effect of experimental acute stress on pain modulation capabilities of triathletes and controls in order to study whether the formers are more susceptible to stress.

Methods: Participants were 25 triathletes and 31 non-athletes who underwent the measurement of heat-pain threshold, heat-pain tolerance, temporal summation of pain (TSP) and conditioned pain modulation (CPM). Testing was conducted before and immediately after exposure to the Montreal Imaging Stress Task (MIST), inducing acute psychosocial stress. Stress levels were evaluated using perceived stress and anxiety ratings, autonomic variables, and salivary cortisol.

Results: While both groups exhibited a significant and similar elevation in perceived stress levels following the MIST, triathletes exhibited stronger elevations in anger and anxiety levels than controls. A differential effect of the MIST was found; only in triathletes was pain threshold decreased after the MIST. In addition, although CPM magnitude decreased in both groups, the reduction was significantly more pronounced in triathletes. Pain catastrophizing was associated with a larger pain-threshold decrease in triathletes and with larger CPM decrease in controls.

Conclusions: The MIST negatively affected pain sensitivity and modulation, more so among triathletes than controls. It appears that the two groups are differentially affected by state and trait stress-related features.

EFIC5-0536

Basic Science (Anatomy/physiology/pharmacology/behaviour): Endogenous pain modulation

PAIN INHIBITORY PROCESSES AND SLEEP DISRUPTIONS IN HEALTHY YOUNG ADULTS.

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Background and aims

Sleep disturbances have been associated with greater pain sensitivity and impaired pain processing. Specifically, experimental sleep deprivation and disruption have been shown to result in greater pain ratings and impairment in Diffuse Noxious Inhibitory Control (DNIC) response. However, few studies have investigated whether DNIC response could also be influenced by naturalistic sleep disruptions. This study aimed to investigate the extent to which sleep disruptions over the course of a week predict subsequent pain ratings and DNIC responses in healthy individuals.

Methods

56 healthy young adults underwent two identical quantitative sensory testing sessions 1 week apart and completed a daily sleep diary in-between. During each of the sessions, Brief Pain Inventory was completed for pain ratings and pressure pain threshold was assessed on right forearm alongside a conditioning stimulus to determine DNIC response. To compare the effect of different DNIC methodologies, two conditioning stimuli were applied to induce pain on the contralateral side of the body – a cold pressor task (standard experimental cold pain) and a physical bag holding task (musculoskeletal pain).

Results

Preliminary examination of data suggests differences between the two DNIC methodologies and that greater pain ratings and impaired pain inhibitory processes as shown by decreased DNIC responses could be associated with prior week's sleep disruptions.

Conclusions

The current study provides further support that physiological pain processes are temporally influenced by naturalistic sleep disruptions. This could have implications for our understanding of pain assessment and pain processing in healthy individuals and clinical populations with chronic pain.

ANTINOCICEPTIVE EFFECT AND MECHANISM OF ACTION OF ISATIN, N-METHYL ISATIN AND OXOPROPYL ISATIN

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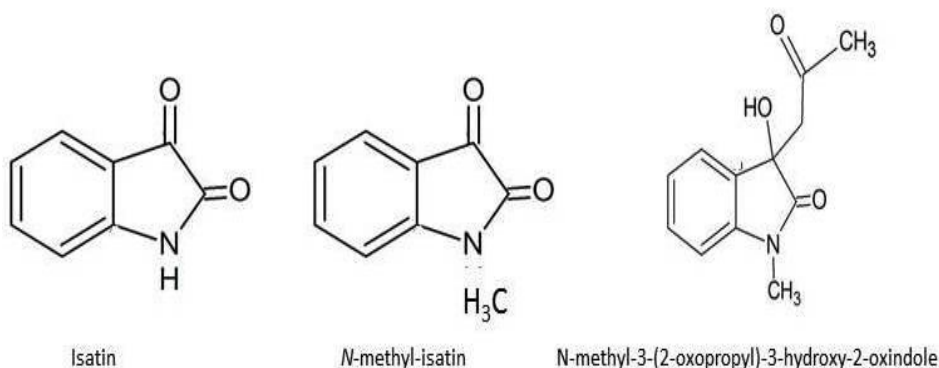
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Background: Isatin is found in plants of the genus *Isatis*. Due to the great synthetic versatility there has been growing interest in the synthesis of new derivatives.

Aims: Characterize the antinociceptive mechanism of action of isatin, *N*-methyl-isatin (MI) and *N*-methyl-3-(2-oxopropyl)-3-hydroxy-2-oxindole (NMO).

Methods: Substances (Figure.0.1-10 mg/kg,p.o.) were studied in chemical (formalin, capsaicin or glutamate-induced licking) or thermal (hot plate,HP) models of nociception. The involvement of several systems was evaluated using different receptor antagonists.



Results: All three substances inhibit both phases of formalin-induced licking, increase the area under the curve and MI and NMO have higher effect than that of morphine (in HP). Capsaicin and glutamate-induced licking were also reduced by all three substances. In HP model, antinociceptive effect of isatin was reduced by naloxone and atropine; MI was reduced by naloxone, atropine and L-NAME; NMO effect was reduced by naloxone, atropine, L-NAME, mecamylamine and ondasetron. Tolerance was observed after two consecutive days of morphine administration whereas this effect was only observed after 6 consecutive days of administration with isatin, MI or NMO.

Conclusions: Isatin, MI, NMO: 1)have antinociceptive activity in models of nociception; 2)capsaicin and glutamate receptors may be involved in mechanism of action; 3)opioid, cholinergic, serotonergic, nitrgic and adrenergic systems may be involved, at least in part, inthe mechanism of action of some of these substances; 4) tolerance only occurs after 6 days of consecutive administration.

Acknowledgements: Alan Minho for technical assistance, Instituto Vital Brazil (Niterói, Brazil) for donation of mice, CNPq, FAPERJ and CAPES for financial support.

CHARACTERISATION OF THE ANTINOCICEPTIVE ACTIVITY OF 3-(2-OXOPROPYL)-3-HYDROXY-2-OXINDOLES

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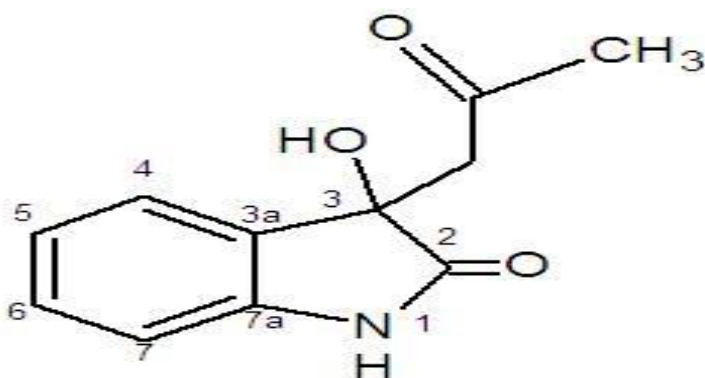
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Background: Convolutamydine A is an oxindole alkaloid that can be isolated from a marine bryozoan. Due to the variety of biological effects analogues were synthesized.

Aims: Evaluate the antinociceptive effects and characterize the mechanism of action of: 5-iodo-3-(2-oxopropyl)-3-hydroxy-2-oxindole (5-Iisa); 5-fluoro-3-(2-oxopropyl)-3-hydroxy-2-oxindole (5-Fisa); 5-chloro-3-(2-oxopropyl)-3-hydroxy-2-oxindole (5-Clisa) and 5-methyl-3-(2-oxopropyl)-3-hydroxy-2-oxindole (5-Meisa) (Figure) in peripheral and central models of nociception.

Methods: Analogues (0.1-10 mg/kg, p.o.) were evaluated in formalin-induced licking and tail flick models of nociception. The mechanism of action was characterized using opioid, nicotinic, muscarinic, adrenergic, serotonergic or nitrgic receptor antagonists.



Results: Oral administered analogues demonstrated more pronounced antinociceptive effects than that obtained with the classical opioid drug morphine (5 mg/kg) in the first and second phases of formalin-induced licking. In the tail flick model, 5-Clisa and 5-Meisa antinociceptive effect was almost twice to that observed with the same dose of morphine. The concomitant administration of diverse antagonists and the analogues indicate that 5-Iisa effects involve the activation of opioid pathway. Whereas 5-Fisa and 5-Clisa has the participation of opioid, nitrgic, cholinergic adrenergic and serotonergic pathways and 5-Meisa has the involvement of opioid, serotonergic and cholinergic pathways.

Conclusions: Our results suggest that the new four analogues from Convolutamydine A have significant antinociceptive effects in thermal and chemical induced nociception and could be used in development of new drugs to be used in pain treatment with reduced side effects.

Acknowledgements: Alan Minho for technical assistance, Instituto Vital Brazil (Niterói, Brazil) for donation of mice and CNPq, FAPERJ and CAPES for financial support.

THE EFFECT OF MIRROR THERAPY ON THE MANAGEMENT OF PHANTOM LIMB PAIN

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Background and Aims: In the last two decades, mirror therapy is becoming widely used on the management of phantom limb pain (PLP). However, the role of nurses on mirror therapy is not yet well-explained. This study was carried out to determine the effect of mirror therapy on the management of phantom limb pain.

Methods: This quasi-experimental study included 15 amputated patients who have phantom limb pain and were followed by the Algology clinic of a university hospital and a private prosthesis clinic in Istanbul, Turkey. Ethical committee approval, institutional permissions and written consents were taken. Forty-minutes of practical mirror therapy education were given to the patients. They were asked to practice mirror therapy for 4 weeks and to write down the severity of their PLP before and after the therapy each day with a 0-10 Numeric Pain Intensity Scale.

Results: Mirror therapy practiced for 4 weeks provided a significant decrease in the severity of PLP. There wasn't any significant relation between the effect of mirror therapy and demographic, amputation and/or PLP related characteristics of the patients. The patients who were not using prosthesis had greater effect from mirror therapy.

Conclusions: Mirror therapy can be used as an adjunctive method in the medical-surgical treatment of PLP. It's a method in which patients can practice independently, and they can enhance their ability to control their PLP. As mirror therapy is a safe, economic and easy-to-use method; in the nursing care plan of the patient with PLP, mirror therapy should be considered.

EFIC5-0138

Clinical pain states: Amputation pain

POST-AMPUTATION PAIN AND ITS PSYCHOSOCIAL CONSEQUENCES: A RETROSPECTIVE ANALYSIS OF 486 PATIENTS

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Background: After surgery, amputees have to face physical consequences like post-amputation pain such as psychosocial consequences which can lead to chronic psychological disorders as depression. The study aim was to retrospectively analyze the data of 482 amputees and the risk factors for post-amputation pain between 2003 and 2013 such as different psychosocial consequences of amputation.

Method: Questionnaires of 482 amputated patients were included in this retrospective analysis. Patients received a standardized hospital psychosocial data questionnaire which contained questions about socio-demographic and amputation data, pain, coping behavior, depressive symptoms and substance consume. Data was analyzed using descriptive statistics, univariate analyses and logistic regression analyses to identify risk factors.

Results: Pain (phantom limb pain, stump pain, back pain) overweighed after amputation (66%). Age, gender, depressive symptomatic such as substance consume were significant risk factors for post-amputation pain, but only depressive symptomatic was identified to correlate significantly with post-amputation pain. Amputation causes did not differ significantly regarding pain or psychosocial consequences.

Conclusion: These outcomes could show that the majority of patients reported significant post-amputation pain which seems to be associated with a decrease in psychosocial functioning and well-being, no matter the amputation cause.

EFIC5-0139

Clinical pain states: Amputation pain

DO TRANSFEMORAL AMPUTEES FACE MORE PAIN? DIFFERENCES IN TRANSTIBIAL AND TRANSFEMORAL AMPUTEES DURING ORTHOPEDIC REHABILITATION

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Background:

After amputation, the majority of patients report different pain sensations like phantom limb pain (PLP), stump pain or wound pain. It is presumed that patients with transfemoral (TF) amputation might face more difficulties in regaining physical health and mobility than patients with transtibial (TT) amputation and might therefore also report more pain sensation. This might also concur with a decrease in health-related quality of life (HRQoL) and mental health.

Material and Methods: 33 TT amputees and 17 TF amputees were assessed at admission (T1) and at discharge (T2) during their stay at an orthopedic rehabilitation center regarding general pain, PLP, phantom sensations and overall health such as psychological variables (HRQoL, depression and body-image).

Results: TF amputees reported significantly higher pain sensation, especially phantom limb pain. Both groups improved most regarding their physical health. Increased physical health was a predictor for increased mental health.

Conclusion: Results concur with former findings that TF amputees face more difficulties in regaining physical health. The results underline the importance of physical health for an improved mental health. However, further research might be necessary to analyze possible causes for an increased pain sensation in TF amputees.

EFIC5-0318

Clinical pain states: Amputation pain

DIFFICULT PAIN THERAPY OF PHANTOM PAIN IN PATIENT WITH A LYMPHEDEMA – A CASE REPORT

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Background: Lymphedema is an edema caused by dysfunction of lymphatic vessels. Lymphedema can be congenital or acquired due to trauma, thrombosis, inflammation or neoplastic obstruction of lymphatic vessels.

Method and Results: Female patient (born 1981) has been treated in our Pain relief service for many years. Her troubles began in 2005 after a carpal tunnel surgery with subsequent edema of hand and forearm, venous thrombosis was excluded. In 2008 a congenital lymphedema was diagnosed by lymphoscintigraphy. Lymphatic drainages were performed several times, always with transitory pain relief. Skin defects and subsequent gangrene and necrosis developed despite several plastic surgeries. Amputation in left arm was performed in 2013 upon the patient's request due to painful defects resistant to therapy. After the surgery a phantom pain occurred in combination with stub pain, VAS up to 8/10. An analgesic therapy of weak opioids with gabapentin and tricyclic antidepressant was not sufficient, thus we tried a coat block with diluted local anesthetic on her stub with a pain reduction for 3 weeks. However, as the lymphedema was progressing in the stub, another coat blocks were not possible. Topical 8% capsaicin brought pain reduction down to 6/10 as an adjunct to strong opioid, gabapentin and tricyclic antidepressant. Recently we consulted the possibility of a neurostimulation therapy.

Conclusion: Using a combined therapy of opioids, gabapentin, tricyclics and a local therapy with coat blocks using diluted local anesthetics and topical capsaicin might provide a pain reduction for a couple of weeks, but this therapy needs repetition.

EFIC5-0764

Clinical pain states: Amputation pain

TREATMENT OF PHANTOM LIMB PAIN WITH AN AUGMENTED REALITY HOME-TRAINING SYSTEM BASED ON THE MIRROR TRAINING AND IMAGERY APPROACH

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Background and aims

About 60-80% of upper limb amputees suffer from phantom limb pain (PLP). Recent treatment methods to reduce PLP include mirror training and imagery approaches. We used a home-training system that utilizes augmented reality. This method makes it possible to fade out the intact arm, allows better control of training conditions, and has several advantages such as the interaction with virtual objects and better monitoring of training progress through recordings of the performance by the system.

Methods

Nine upper limb amputees with PLP participated in the study. Patients trained at home once a day for four weeks. Training performance was recorded by the system and patients gave daily pain reports two weeks before and after and during training.

Results

Performance significantly improved in three of the four training tasks. On average, the patients showed alleviation of their PLP during the first week of the training, but pain increased again to baseline later. Six of nine patients showed a slight reduction in PLP ratings from baseline to the end of the training.

Conclusion

In contrast to previously reported effects of mirror training, patients' pain only slightly improved with the training. Other mechanisms like cognitive distraction could have led to temporary reduction of PLP at the beginning of training.

Acknowledgement

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EFIC5-1011

Clinical pain states: Amputation pain

CHANGES OF BRAIN ACTIVITY DURING MOVEMENT OF THE LIMBS ARE ASSOCIATED WITH CHANGES OF PHANTOM LIMB PAIN

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Background and aim:

In at least every second person concerned with arm amputation the arm painfully infills consciousness (phantom limb pain, PLP). Continued consideration of the factors associated with PLP is of utmost importance for efficacious pain management. It was suggested, that following cortical reorganization neural signals might trigger activation in “pain memory networks” which we suppose being related to brain networks representing sensorimotor experiences with the hand. Next to that, when a phantom percept is turned into an aversive, painful phantom percept, it might be hypothesized, that brain activation in areas concerned with perception (prefrontal cortex, parietal cortex), salience (midcingulate cortex, anterior insula (AI)), and distress (AI, subgenual anterior cingulate cortex) changes.

Method:

This study investigates the hemodynamic correlates of intraindividual changes in PLP-intensity with fMRI during movement of the affected arm, the intact arm and the lips. Twelve upper limb amputees were studied before and after treating PLP with a somatosensory-feedback-hand prosthesis.

Results:

Variations of PLP-intensity were related to differences of BOLD-responses (POST-PRE) in hypothesized brain regions. Covariations were especially apparent while the affected arm was moved and aside from that when the not affected arm was moved. BOLD-responses induced by movements of the lips were not associated with variations of PLP-intensity in this study.

Conclusion:

Variations of PLP-intensity are associated with activity changes in brain regions realizing perception, action, salience and distress. This finding advances the knowledge about the representation of the painful phantom limb in the brain.

Acknowledgement: This study was supported by the German Social Accident Insurance FR196.

EVIDENCE OF SYMMETRY AND MIRROR-IMAGE KNEE PAIN IN ADOLESCENTS WITH LONG-STANDING PATELLOFEMORAL PAIN

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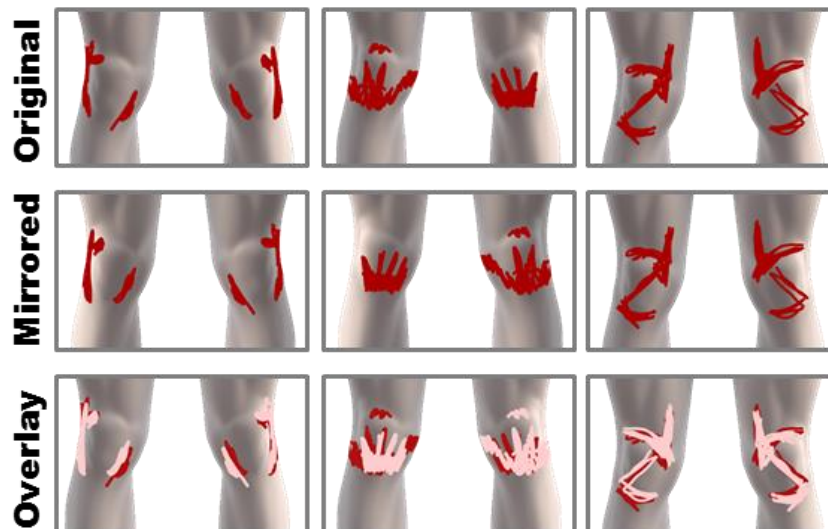
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Background and aim: Knee pain affect 33% of all adolescents. The most common condition is patellofemoral pain (PFP). Difficulty emerges when trying to identify which anatomical structures, pain pathways, or underlying mechanisms contribute to their pain. Enhanced communication and expressions of pain localisation may offer valuable information to assist in the assessment of PFP. Aim: To explore and analyse knee pain drawings from adolescents with PFP.

Methods: Thirty-five adolescents aged 18-22 years with long-standing PFP were recruited (median pain duration 5 years). They were instructed to draw their knee pain on an image of a knee on a tablet computer. Localisation (retro- and peripatellar), laterality (unilateral vs. bilateral) and area of pain (expressed as pixels) were extracted and contrasted to current pain intensity and duration of symptoms.

Results: The majority patients reported pain in the peripatellar region (34/35). Of all pain drawings, 27/35 patients presented with bilateral pain and 21/27 revealed highly symmetrical and mirror-image pain between the left and right knee (refer to three examples shown below). Adolescents with an extensive duration of knee pain (five years or more) had more widespread area of knee pain ($p=0.001$) and the greater the area of their pain the higher their current pain intensity ($p=0.006$).

Conclusion: Mirror-image pain was a novel and predominant characteristic found in adolescents with long-standing knee pain and the relationship between mirror-image pain and symptom duration should be further explored.



EFIC5-0145

Clinical pain states: Joint, bone, and muscle pain

A SOFT STUDY IN PAIN- A CASE STUDY

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G.H is a young man diagnosed with Stiff Person Syndrome (SPS), a rare autoimmune neurological syndrome. First described in 1965, SPS is accompanied by spasm attacks, sharp and prolonged pain, anxiety and/or mental disorders. Two months prior to hospitalization G.H described feeling fatigue with progressive difficulty in walking. The patient was hospitalized due to involuntary muscle movements accompanied by spasms, stiffness and tension of the chest muscles and rib cage. Symptoms included headaches, sore limbs, knees, chest and abdominal muscles, and limitation in movement. The spasm attacks and pain caused stress, bursts of anger and bouts of crying. During an attack the patient experienced pain at VAS 10 strength and 6-7 VAS between attacks. The attack increased his anxiety and fear, necessitated immediate aid and pain relief. The patient's complex psycho-social background consists of ADHD, anxiety and a complicated family background. The patient was treated with plasmapheresis, an analgesic and muscle relaxant that reduces spastic seizure intensity and improves regular function for a prolonged period of time. This lecture will describe the course of treatment and the recovery process of G.H. We will review the syndrome pathways, the accepted treatment, prognosis and treatment of pain in different stages, as is described in the current literature. To summarize, the purpose of this presentation is to learn about the syndrome so closely related to pain and its unique analgesic treatment.

THE RELATIONSHIP BETWEEN KNEE PAIN INTENSITY AND VITAMIN D IN KNEE OSTEOARTHRITIS

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Background and aim: knee pain and vitamin D deficiency are associated with knee osteoarthritis (KOA). This study aimed to investigate the association between knee pain intensity and also quadriceps muscle strength (QMS) with vitamin D in KOA.

Methods: Patients with KOA aged ≥ 40 years old were studied. Intensity of knee pain was determined by Western Ontario and McMaster University Osteoarthritis pain scale. QMS was assessed by hand held dynamometry method and serum 25-OHD level by ELISA method. Serum 25-OHD $< 20\text{ng/ml}$ was considered deficiency. The objective of this study was to determine association between knee pain with serum 25-OHD and QMS. Association between serum 25-OHD and knee pain was also determined.

Results: 92 patients were studied. Serum 25-OHD did not correlate with knee pain ($p = 0.13$). There was a significant negative correlation between QMS and knee pain ($r = -0.232$, $r^2 = 5.3\%$, $p = 0.034$). Serum 25-OHD was positively correlated with QMS ($r = 0.304$, $r^2 = 9.24\%$, $p = 0.005$). There was a positive linear relationship between serum 25-OHD and QMS ($r = 0.304$, $r^2 = 9.3\%$, $p = 0.005$). For each 1ng/ml increase in concentration of serum 25-OHD, the value of QMS rose by $14.2 \pm 3.5\%$ ($p = 0.014$).

Conclusions: The findings of this study demonstrate a significant correlation between QMS with both serum vitamin D and knee pain indicating a confounding role for quadriceps muscle in the association between vitamin D and pain. Regarding high contribution of quadriceps muscle weakness in the development and progression of KOA, these findings suggest serum 25-OHD rising to sufficient level.

EFIC5-0200

Clinical pain states: Joint, bone, and muscle pain

ENTHESOPATHY OF ERECTOR SPINAE MUSCLES AS CAUSE FOR THE ILIAC CREST PAIN SYNDROME – A DIAGNOSTIC ULTRASOUND STUDY IN LOW BACK PAIN

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Background: A regional pain syndrome (Iliac Crest Pain Syndrome) has been described in many LBP patients, but its cause remained unidentified. The painful site in this syndrome overlaps with the site of attachment of the largest of back muscles - Erector Spinae. As enthesopathies (attachment pathology) are underlying cause in many musculoskeletal disorders we performed an ultrasound study of Erector Spinae entheses in patients with unilateral chronic pain over medial iliac crest.

Methods: We studied 50 patients. The non painful contra lateral side of the same patients and both sides of another 50 adults without complaints served as controls. Longitudinal and transverse scans of the attachment site of Erector Spinae to the iliac crest were obtained with linear 7,5-12 MHz transducer. Four parameters of the entheses were analyzed: 1. Thickness; 2. Echogenicity, 3. Calcifications, 4. Bony irregularities.

Results: 1. Entheses on the painful side were thicker (men 7.38, wimen: 7.34 mm) than both contra lateral ones (m: 5.74, w: 5.14 mm) and those in controls (m: 5.85, w: 5.16 mm).

2. Entheses on the painful side were more often hypoechoic – 8/10 m and 18/20 w, than both contra lateral (0/5 m, 2/20 w) and controls (2/20 m and 3/40 w);

3. Entheses on the painful side had calcifications in 3/10 m and 6/20 w and in neither contralateral and controls.

4. Bony irregularities - no statistical difference.

Conclusion: Enthesopathies could be a source for pain in the lower back. Ultrasound examination could help in reaching a more precise diagnosis in “nonspecific” LBP.

EFIC5-0267

Clinical pain states: Joint, bone, and muscle pain

SONOGRAPHIC FEATURES OF PIRIFORMIS SYNDROME – AN ULTRASOUND STUDY IN LOW BACK PAIN

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Background: Piriformis Syndrome could cause chronic debilitating suffering but as specific confirmatory tests are lacking, it remains mainly a diagnosis of exclusion. On the other hand ultrasound is a modality particularly efficient in the evaluation of soft tissues.

Methods: We studied sonographically the piriformis muscles of 30 patients with chronic, regional unilateral low back and gluteal pain. The contra lateral, non painful side of the same individuals as well as both piriformis muscles of another 20 adults without complaints served as control. US scans parallel to the long axis of the muscle were performed with a 7,5-10 MHz linear probe and three parameters were analyzed: 1. Muscle thickness; 2. Muscle echogenicity; 3 Muscle dynamics – smoothness of muscle gliding over iliac bone with hip passively internally and externally rotated.

Results: 1. Thickness: The difference between the non painful piriformis muscles in the same individual was neglectable: average 0.5, maximal 1.3 mm. On the other hand there was significant asymmetry between size of painful and non-painful piriformis muscle in the same patient: aver 3.98, max 10.4 mm. 2. Echogenicity: painful muscles were more often hypoechogenic (22/30), than non-painful ones (11/70). 3. Dynamic scanning - non painful muscles showed smooth movement of the muscle over the iliac bone. On the other hand painful muscles showed in 15 out of 30 non smooth movements with catching of the muscle over the iliac bone.

Conclusions: Marked asymmetry in muscles size between sides as well as its non-smooth movement could be signs of Piriformis Syndrome.

PARRY ROMBERG SYNDROME AND PAIN

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Parry Romberg Syndrome, a disease of unknown origin that develops in the first or second decade of life, involving soft tissue and bone. Females are more affected than males , rarely found bilaterally. The documented inflammatory changes in the brain parenchyma and vessel walls, occasional coexisting autoimmune disorders and clinical improvement following immunosuppression suggest that this could be an immune-mediated disease. The aim of this study was to elucidate a clinical case of a rare syndrome with pain, the 15 years old female patient that was born with teeths, with three years old had pain on her legs and difficult to walk, also has stain in the face and difficult to see. Six months ago she started with hip and knee bilateral pain. Duloxetine 30 mg a day was started, withouth side effects and with completely pain relieve. Background and aims. This understood degenerative condition is characterized by atrophic changes affecting one side of the body. The cause of these changes remains unclear. There are few studies showing pain in this syndrome, most of this pain happens in face. Methods: The authors report one rare case of young woman of 15 years old, accompanied by a brief review of literature. Results: Clinical examination of the patient revealed evidence facial asymmetry and scoliosis lombar. Final diagnosis of a Parry Romberg syndrome was based on thorough clinical and radiological examination. Treatment using duloxetine 30 mg day was perfomed. Conclusions: Most of cases, Parry Romberg Syndrome appears to occur randomly for unknown reasons. The pathophysiology of the syndrome remains unknown.

EFIC5-0298

Clinical pain states: Joint, bone, and muscle pain

THE RELATION BETWEEN REFERRAL PAIN AND THE NERVE DISTRIBUTION IN HIP AND KNEE JOINTS

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Background

Patients with hip disease sometimes complain of widespread pain in their lower limbs. The articular branches of the femoral and obturator nerves are considered to be the source of the referral pain. This study investigated referral pain patterns in patients with hip disease and the distribution of the articular branches of the femoral and obturator nerves.

Method

A total of 113 patients with hip joint disease were included in the investigation. The incidence of regional pain and the pain referral patterns were evaluated before and after arthroplasty. The lower limbs of nine cadavers were also observed, macroscopically, to verify the innervation of the hip and knee joints.

Results

Preoperatively, the anterior knee was the most common pain location (33.6%, in motion) in addition to the hip joint area. However, most patients reported the marked disappearance of this pain, postoperatively. Of note was the remarkable incidence of pain radiating from the groin to the anterior knee. In six of nine cadaveric limbs, the femoral nerves supplied the small branches to the anteromedial hip joints; in three limbs, the articular branches were divided from the pectineus branches. Additionally in those limbs, the small branches that pierced the vastus medialis and articularis genus also innervated the anteromedial knee joint capsule.

Conclusion

Our results suggest that radiating anterior knee pain, in patients with hip disease, was referral pain originating from the hip joint. The pain was related to the sensory distribution of the femoral nerve articular branches to the hip and knee joints.

EFIC5-0388

Clinical pain states: Joint, bone, and muscle pain

NURSES ARE THE MOST IN DANGER IN TERMS OF MUSCULOSKELETAL PAIN AMONG HOSPITAL STAFFS

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Background and aims

The musculoskeletal problems (MSP) which cause pain vary among different occupations since they had different characteristics and physical workloads. Therefore, it is important to know the difference between the occupational groups to design preventive treatment interventions. The aim was to investigate the prevalence differences of MSPs and related physical workload among hospital staffs.

Methods

In this cross-sectional study, 416 hospital staffs completed the Nordic Musculoskeletal Questionnaire for screening of the MSPs and Physical Workload Questionnaire for assessing the physical workload of their occupations.

Results

One-year prevalence of pain at low back, neck, upper back, and shoulders regions were 73.8%, 59.9%, 59.4%, and 52.2%, respectively. The most preventing pain from work found in low back (39.2%), upper back (26.7%), and neck regions (24.5%). The low back pain impacted nurses the most with 1-year prevalence of 81.3% and 57.1% of nurses were prevented from work. Nurses, service and cleaning staffs had significantly more physical workload than secretaries and physicians.

Conclusions

Low back pain had the highest prevalence among hospital staff and it was the highest cause of preventing from work. Nurses were the most in danger in terms of MSPs among hospital staffs. Physical workload was significantly higher in nurses, service and cleaning staffs than secretaries and physicians. This study suggests that preventing programs should focus on ergonomic approaches to decrease of physical workloads for nurses, service and cleaning staffs.

EFIC5-0400

Clinical pain states: Joint, bone, and muscle pain

INFLUENCE OF VERTEBRAL DEFORMATION ON THE VERTEBRAL PAIN SYNDROME

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The aim of our study is to investigate the relation between the intensity of pain in the thoracic and lumbar spine and morphometric parameters of vertebrae in postmenopausal women.

Object. We have examined 250 postmenopausal women aged 50-79 years divided into two groups: 171 women without vertebral deformations and 79 women with confirmed vertebral fractures. The duration of pain syndrome after fracture was over 6 months.

Methods. The presence and intensity of pain syndrome in the thoracic and lumbar spine were assessed using a visual analog scale (VAS). Morphometric analysis of the vertebral parameters was carried out using the VFA software of the dual-energy X-ray densitometer «Prodigy» (GE Medical systems, Lunar, model 8743, 2005).

Results. The intensity of pain syndrome in the lumbar spine significantly correlates with L1 vertebral indices: A/P ($r=-0.37$, $p=0.01$) and M/P ($r=-0.29$, $p=0.03$) in women with normal BMD. The intensity of pain in the thoracic region correlates with Th10 vertebral indices: A/P ($r=-0.45$, $p=0.0004$) and M/P ($r=-0.35$, $p=0.01$) in women with osteopenia. In 11% patients with confirmed wedge and compression vertebral fractures chronic pain syndrome is absent, and the presence of other fractures does not increase the frequency of back pain syndrome (14%).

The presence of vertebral fractures significantly increases the risk of pain in the thoracic spine (RR=1.32; 95% CI: 1.09-1.60, $p=0.004$).

Conclusion. In postmenopausal women without osteoporosis and vertebral fractures level of pain may be associated with initial vertebral deformation, limiting the spine transition zone.

EFIC5-0402

Clinical pain states: Joint, bone, and muscle pain

LOW BONE MINERAL DENSITY AND ANTHROPOMETRIC CHARACTERISTICS IN PATIENTS WITH VERTEBRAL PAIN SYNDROME

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The aim is to study features of vertebral pain in older women depending on their bone mineral density (BMD) and body mass index(BMI).

Object. 1028 postmenopausal women aged 50 years and older were examined. The patients were divided into groups based on their BMD and BMI (18.4 kg/m²(underweight), 18.5-24.9 kg/m²(normal), 25-30 kg/m²(overweight) and more than 30.1 kg/m²(obese)).

Methods. The presence and intensity of pain was assessed using a visual analogue scale (VAS). BMI was calculated by the standard method based on measurements of body weight and height. BMD at the lumbar spine was determined using dual-energy X-ray densitometer «Prodigy» (GE Medical systems, Lunar, model 8743, 2005).

Results. The level of pain in the thoracic region of the underweight patients with osteoporosis/osteopenia is significantly higher compared with women who have a normal BMD. In women with systemic osteoporosis, BMI is significantly negatively correlated with the level of pain in the thoracic region and increases the risk of pain twice compared to the patients with normal BMD (RR=2.00 (95% CI:1.23-3.27; p=0.005). The presence of obesity in women with systemic osteoporosis does not alter the risk of pain in the thoracic region (RR=0.95 (95%CI:0.67-1.32; p=0.75). BMI in women with systemic osteoporosis does not correlate with the intensity of pain in the lumbar spine and does not alter the risk of pain developing (RR=1.03 (95% CI:0.96-1.12; p=0.39)).

Conclusion. Underweight in women of the older age groups with systemic osteoporosis is associated with an increased risk and severity of pain in the thoracic region.

EFIC5-0429

Clinical pain states: Joint, bone, and muscle pain

MANAGEMENT OF IATROGENICALLY INDUCED OPIOID DEPENDENCE

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Introduction. Opioids are valuable analgesics, capable of providing pain relief and functional improvement also in chronic noncancer-related pain (NCP) patients. However, recent data have shown that the increasing prescription of opioids is associated with a rise in aberrant drug-related behaviour.

Methodology: A prospective study was performed with 70 NCP outpatients diagnosed with opioid iatrogenic DSMIV dependence and severe pain intensity. Study focus on analgesic efficacy, opioid withdrawal syndrome prevention, adverse side effects, functional status and aberrant drug-related behaviour. We design a contractual agreement on opioid therapy including goals, side effects and criteria to finish the opioid therapy. Genotyping of the *OPRM* (*rs1799971*), *COMT* (*rs4680*) and *ABCB* (*rs1045642*) genes was performed.

Results: Results from 73% (50/70) of the patients are presented. After a structured and progressive opioid conversion to buprenorphine/tramadol, a significant reduction of 47% of the total daily dose (TDD) with no withdrawal symptoms (OWS reduction of 9 points) was achieved, maintaining a moderate relief and pain intensity score. Quality of life tends to improve, as do the number of adverse reactions reported by the patients throughout the visits. *OPRM* and *COMT* gene variant distribution but *ABCB* variants were higher prevalent (9% C/C, 65% C/T, 26% T/T) vs general population distribution (21% C/C, 49% C/T, 25% T/T). Psychosocial risk was associated to a high prevalence of opioide iatrogenic dependence.

Conclusions: The indication for the prescription of opioids must be very carefully weighed in the presence of any risk factors. In these cases the integration into a multimodal, interdisciplinary therapy programme is mandatory.

EFIC5-0459

Clinical pain states: Joint, bone, and muscle pain

REFLEX RECEPTIVE FIELDS IN PATIENTS WITH ACUTE AND CHRONIC LOW BACK PAIN – A CASE-CONTROL STUDY

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Background and aim: Currently the transition from acute (ALBP) to chronic low back pain (CLBP) can only be predicted to a limited extent. Central hypersensitivity is a potential predictor. The area of Reflex Receptive Fields (RRF) is a novel method to assess central hypersensitivity. The RRF area denotes the area of the sole of the foot from which spinal nociceptive reflexes (NWR) can be elicited. We performed a case-control study measuring the RRF in patients with ALBP and CLBP. The aim was to evaluate the potential role of RRF in predicting the transition from ALBP to CLBP.

Methods: NWR were evoked by electrical stimulation at ten spots of the foot sole. NWR were evoked by electrical stimulation at ten sites on the sole of the foot and the RRF was defined as the area from which a NWR could be evoked following a predefined detection criterion. We computed unadjusted and adjusted linear regression models to assess the effect of the RRF on chronic pain.

Results: We studied 108 patients with ALBP and 111 patients with CLBP. The unadjusted linear regression suggests a smaller RRF in patients with CLBP (regression coefficient -0.02; 95%CI -0.077-0.03; p=0.39). After adjustment for gender, age, pain intensity and depression, it decreased to -0.01 (95%CI -0.08-0.06); p=0.77.

Conclusion: No difference in the RRF area could be detected in patients with acute and chronic low back pain. This suggests that RRF may not predict the transition from acute to chronic low back pain.

EFIC5-0462

Clinical pain states: Joint, bone, and muscle pain

PREDICTIVE VALUE OF RECEPTIVE FIELDS FOR PERSISTENCE OF PAIN AFTER SPINAL SURGERY – A COHORT STUDY

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Background and aim: Failed back surgery is a largely unresolved clinical issue. Central hypersensitivity is a potential determinant of persistent postoperative pain. The area of Reflex Receptive Fields (RRF) is a novel method to assess central hypersensitivity. The RRF denotes the area of the foot sole from which spinal nociceptive reflexes (NWR) can be elicited. The aim was to evaluate the predictive value of the RRF area for failed back surgery.

Methods: We performed a prospective cohort study in patients undergoing spinal surgery and compared the RRF area in patients with failed and non-failed back pain surgery at two month's follow-up. Treatment failure was defined as less than 30% reduction from baseline pain. NWR were evoked by electrical stimulation at ten sites on the foot sole. RRF was defined as the skin area from which a NWR could be evoked following a pre-defined detection criterion. We tested the hypothesis that the size of the RRF area is larger in failed back surgery patients, as compared with non-failures. The data were analyzed by Student's-t-test.

Results: We included 111 patients who underwent low back spinal surgery. 17% of all patients showed treatment failure two months after surgery. Failures showed a mean RRF area of 0.327 (SD 0.206), which was not significantly different from non-failure patients with a mean RRF area 0.328 (SD 0.207), $p=0.99$.

Conclusion: Central hypersensitivity as detected by an expansion of RRF area is unlikely to explain persistent pain two months after spinal surgery.

EFIC5-0583

Clinical pain states: Joint, bone, and muscle pain

DIFFERENCES IN QUANTITATIVE SENSORY TESTING MEASURES IN PATIENTS WITH POOR OUTCOMES FOLLOWING TOTAL KNEE REPLACEMENT

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Background and aims

Total knee replacement (TKR) is a standard intervention for painful knee osteoarthritis, yet up to 15% of patients report severe persistent postsurgical pain. The aim of this study was to determine whether patients with persistent pain post TKR exhibit widespread multi-modality hyperalgesia.

Methods

Fifty-three participants, between 12-36 months following TKR surgery were divided into 'good outcome' and 'poor outcome' groups, based on Knee Society Score at one year. There were 31 participants in the good outcome group (13 male and 18 female; mean age 69.9 ± 7.25) and 22 participants in the poor outcome group (6 male and 16 female; mean age 69.8 ± 7.07). Subjects were independently allocated to either good or poor outcome groups by Joint Replacement Assessment Clinic (JRAC) staff. Pressure pain thresholds (PPT) were measured using a digital algometer and thermal thresholds were measured using a Thermode. These measures were obtained at the operated knee and over the extensor carpi radialis brevis (ECRB) muscle in the forearm. Subjects also completed a number of questionnaires to evaluate pain, function and quality of life.

Results

At the knee, significant group differences were found for PPT ($p=0.025$), heat detection threshold ($p=0.009$) and cold pain threshold ($p=0.008$). Similar differences were found at the ECRB site as well as elevated heat pain threshold ($p=0.032$).

Conclusions

Individuals with poor outcomes following TKR exhibited widespread mechanical and thermal (multi-modality) hyperalgesia. This may indicate that central augmentation of pain is an important contributor to poor outcomes following joint replacement surgery.

EFIC5-0594

Clinical pain states: Joint, bone, and muscle pain

SELF-CHECKING-TYPE, REPETITIVE PATIENT EDUCATION (SCRE) EFFICACY FOR TEMPOROMANDIBULAR DISORDER (TMD) PATIENTS

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The purpose of this research was twofold: to compare the short-term efficacy of once-off education versus repetitive education of patients suffering from temporomandibular disorders (TMDs) and to determine whether there was any correlation amongst patient demographics, recommendation adherence degree and pain levels. A total of 848 patients with TMDs were enrolled. The control group consisted of patients who received a standard conservative treatment (STD) over at least 6 visits with education provided only during the first visit. The experimental group consisted of patients who received STD but had also been given repetitive education (STD+RE). The repetitive education was delivered through a standardized self-assessment questionnaire (SAQ) that was completed by the patient during each visit.

Pain, which included maximum comfortable opening of the mouth (MCO) and mouth opening limitation (LOM), was compared between the two groups. Behavior pattern and reported pain level changes in the group who used the SAQ were also analyzed. The LOM was significantly improved in all of the experimental group patients (especially in females under 30 years of age, $p < 0.05$). The MCO was significantly higher in females ($p = 0.029$) and in patients under 30 years of age ($p = 0.056$). All of the patients displayed improvements in their habits following repetitive education, which resulted in a strong correlation with pain reduction. Adhering to the recommendations regarding questions 14 and 15 of the SAQ appeared to have the greatest effect on pain reduction. These results clearly demonstrate that repetitive education is more effective than once-off education for TMD patients who are female or under 30 years of age.

EFIC5-0635

Clinical pain states: Joint, bone, and muscle pain

DO PEOPLE WITH CHRONIC PAIN JUDGE THEIR SLEEP DIFFERENTLY? A QUALITATIVE STUDY

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Background and aims: Poor sleep quality is reported by as many as 99% of patients with fibromyalgia, whilst clinical level of insomnia is found in between 53-79% of mixed group patients with localised and diffuse pain. Despite being a common criterion used for evaluating sleep experience, there is no authoritative definition of what sleep quality is and how the sleepers interpret their sleep. The present study aimed to explore the definitions of sleep quality among people with and without chronic pain.

Methods: Six participants with fibromyalgia, five participants with back pain, and six individuals without chronic pain were invited to attend a semi-structured interview, in which they were asked to talk about their current sleep pattern and how they judge their sleep quality. All interview were audio-recorded and transcribed verbatim. A thematic analysis was carried out on all transcripts.

Results: Four themes were identified as the salient criteria used for judging sleep quality: *Memories of night-time sleep disruptions; Feelings on waking and cognitive functioning during the day; Ability to engage in daytime physical and social activity; Changes in physical symptoms and pain sensation.*

Conclusion: Sleep quality was often retrospectively inferred based on the participants' feelings on waking, evaluation of their cognitive state and task performance during the day, and ability to engage in physical and social activities as planned. Overall the criteria for judging sleep quality appeared to be similar across the participants although pain was specifically mentioned by participants with fibromyalgia and back pain as an indicator of poor quality sleep.

EFIC5-0641

Clinical pain states: Joint, bone, and muscle pain

THE LONG POSTERIOR SACROILIAC LIGAMENT IN LUMBOPELVIC PAIN COMPARISON OF CLINICAL AND EXPERIMENTAL FINDINGS

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Background and aims: Managing lumbopelvic pain (LPP) originating from the sacroiliac joint (SIJ) complex is challenging which may to some extent relate with the lack of accurate clinical diagnostic tools. The aim of the project was to investigate the role of the long dorsal ligament (LDL) as a source of symptoms in LPP by comparing clinical diagnostic tools in experimental and clinical pain conditions.

Methods: Two experimental studies investigated the outcome of pain provocation tests of the SIJ (n=15) and the active straight leg raise test (ASLR) (n=17) in the presence of saline-induced LDL pain by injections of hypertonic saline (1 ml, 5.8%). Additionally, pressure pain thresholds (PPTs) in the lumbopelvic region and pain referral patterns were investigated. These findings were compared with a group of pregnant women (n=39).

Results: Experimental LDL pain caused a significant increase in the number of positive pain provocation tests and a facilitated response to the outcome of the ASLR test ($P < 0.05$). Furthermore, an extensive pain referral pattern was demonstrated and significant a reduction in regional PPTs was found ($P < 0.05$). At baseline, the control group was significantly different from the pregnant group at all parameters ($P < 0.05$) but during pain, no significant differences were found in all measured parameters when comparing the groups.

Conclusions: The results underline the potential role of the LDL in lumbopelvic pain as suggested in previous studies. These findings shed a light on the mechanisms underlying clinical LPP which is valuable with regards to assessment and management of patients.

EFIC5-0697

Clinical pain states: Joint, bone, and muscle pain

CORRELATION BETWEEN PATIENTS FEAR, PAIN PROCESSING AND EARLY OUTCOME AFTER TOTAL KNEE ARTHROPLASTY SURGERY

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Background: The first aim was to evaluate the correlation between patients fear, pain processing, pain management and the clinical outcome before and after Total Knee Arthroplasty (TKA) implantation. The second aim was to identify a measurement tool to detect high-risk patients for pain processing disorders before surgery.

Methods: In this prospective study, 50 TKA patients (mean 66 yrs.; range 50-84 yrs.) were managed perioperatively by an institutional multimodal pain protocol (1). To evaluate patients' fear and pain processing, different questionnaires (Table 1) were used immediately before surgery (T1prä) and 5-7 days postoperatively (T2post). WOMAC Scale, NRS and additional consumption of pain medication were assessed for clinical outcome.

Results: The results demonstrated a correlation between the intensity of pain (NRS) and early functional outcome (WOMAC) for T2post. Pain processing (FESV) showed a significant correlation between T1prä and T2post and a significant negative correlation to the functional outcome (WOMAC). All other investigated parameters did not show any clinical correlation.

Conclusions: Pain intensity, but not trait anxiety, was an indicator for a poor early clinical outcome. Inadequate pain processing caused increased pain intensity and clinical outcome despite modern pain protocols. The FESV could be identified as a screening tool to detect patients with insufficient or inadequate pain processing before surgery. Further studies will have to demonstrate if preoperative treatment and care of these patients at risk will change their unfavorable outcome.

measurement	content
NEO-FFI	Personality traits
FESV	Behavioral pain processing/coping
WOMAC	Function/movement
NRS	Pain Intensity

Table 1: Test procedure

EFIC5-0761

Clinical pain states: Joint, bone, and muscle pain

ACUTE EFFECT OF KINESIOTAPING ON MEDIAL EPICONDYLE PAIN: PILOT STUDY

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Background and aims

Medial epicondylitis is a well-known painful disorder affecting the medial elbow in the region of the superficialis flexor digitorum among computer users. The aim of this study was to investigate the acute effect of Kinesiotaping on elbow pain in computer users.

Methods

20 healthy, aggravation test positive women (mean age 25.5 ± 6.9) subjects were participated into 2 groups [placebo taping (PTG) and real taping group (RTG)]. Daily working hours and demographic information were recorded. For pain Visual Analog scale (VAS), MAYO elbow performance index (MAYO); for muscle strength (flexion, extension, supination, pronation and grip) Hydraulic Hand Dynamometer and Lafayette Manuel Muscle Testing System were used. Tests were proceed before and 3 days after taping.

Results

There was no significant data in both group before taping. MAYO and VAS were significantly different in both groups after taping but there was no significancy between groups on MAYO and VAS after taping. Aggravation test positivity was significantly reduced in RTG after taping. There was no significant effect for muscle strength in both groups. There were significant difference for elbow circumference and extension muscle strength between PTG and RTG after taping. There was positive correlation between working hours and VAS in all participants before taping.

Conclusions

The results of this pilot study showed that kinesiotaping has an acute effect to reduce pain. However it has no effect on muscle strength. Future studies are planned on larger population to understand acute effect of Kinesiotaping on pain and muscle strength in medial epicondylitis.

THE INFLUENCE OF EXPERIMENTAL THIGH AND GROIN PAIN ON THE MECHANICAL SENSITIVITY, PAIN DISTRIBUTION AND CLINICAL TESTS OF THE ADDUCTOR LONGUS

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Background and aims: Emerging evidence indicates that mechanical pain sensitivity precedes training restrictions in athletes which may also contribute to the development of groin pain. Manual palpation and clinical orthopaedic tests may be useful to establish the underlying cause of pain but the accuracy of these methods is unclear. This study investigated the outcome of a battery of clinical diagnostic tests and pain sensitivity in healthy subjects in the presence of a standardised painful stimulus in the groin.

Methods: Experimental pain was induced in 15 pain-free males, by hypertonic saline injections (1 mL, 5.8%) into the adductor longus tendon (AL) and the rectus femoris muscle (RF) with isotonic saline (1 mL, 0.9%) used as control. Pain intensity assessed on an electronic visual analogue scale (VAS), Pressure-Pain Thresholds (PPT), pain distribution and response to clinical provocation tests were measured.

Results: Experimental pain from the RF caused a reduction in PPTs at RF and AL tendon ($P < 0.05$) whereas the AL injection only caused an increase in PPT at RF on the contralateral side ($P < 0.05$). A significant increase in positive adductor provocation tests was found after AL injections ($P < 0.05$). AL exhibited a local pattern of pain whereas RF showed a wider pain distribution.

Conclusion: In contrast with the findings from experimental pain in the adductor longus, the RF exhibited a broader pattern of pain and significantly altered the mechanical sensitivity of the AL tendon but not the enthesis. The hip adductor clinical tests are useful for the diagnosis of AL tendon pain.

EFIC5-0779

Clinical pain states: Joint, bone, and muscle pain

CHARACTERISTICS OF PATIENTS WITH ABNORMAL PAIN RESPONSE FOLLOWING SHOULDER INJURY

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BACKGROUND: Exaggerated physical and emotional pain behavior and under-performance on physical capacity testing are commonly observed, following compensable accidents covered by the Workers Compensation Board. However, the literature on the relationship between these behaviors and patient demographics remains limited.

METHODS: This study involved a retrospective review of electronic files of injured workers seen within the first 16 weeks of injury or recurrence. Abnormal pain response (APR) was defined as exaggerated pain behaviors including facial grimacing, shaking, guarding against examiners' attempt to move the involved upper extremity and pulling away or giving way. Measures of functional difficulty and pain were the Quick Disabilities of the Arm, Shoulder and Hand (Quick DASH) and Numeric Pain Scale (NPS).

RESULTS: Data of 750 patients who had sustained a work-related shoulder injury and were referred to an Early Shoulder Physician Assessment (ESPA) Program were reviewed. Sixty two (8%) patients, 39(63%) females demonstrated APR during the initial assessment. This group was younger (45 years vs. 49, $p=0.002$), had more females (63% vs. 43%, $p=0.003$), reported more pain, had higher disability ($p<0.0001$) and consumed more analgesic medication ($p=0.003$). However, there were no statistically significant differences between groups with respect to mechanism of injury, coexisting co-morbidity, severity of pathology or need for shoulder surgery.

CONCLUSION: Abnormal pain response following a compensated shoulder injury was associated with younger age, female sex, and reports of higher pain and disability. Severity of pathology, existence of co-morbidity or need for surgery did not explain the existence of exaggerated pain behaviors.

SENSITIZATION IN PATIENTS WITH PAINFUL KNEE OSTEOARTHRITIS REFERRED FOR PHYSIOTHERAPY*H. O'Leary¹, C. Doody¹, K. Smart², N. Moloney³*¹*School of Physiotherapy, University College Dublin, Dublin, Ireland*²*Physiotherapy Department, St. Vincent's University Hospital, Dublin, Ireland*³*Department of Health Sciences, Macquarie University, Sydney, Australia*

Background and Aims: Abnormalities in pain processing have been widely reported in patients undergoing knee arthroplasty however most patients with knee osteoarthritis (OA) are managed conservatively. This study will describe the clinical and somatosensory characteristics of people with knee OA referred for physiotherapy. It will explore the extent to which quantitative sensory testing (QST) results correlate with some clinical pain measures.

Methods: Seventy participants with moderate/severe symptomatic knee OA awaiting physiotherapy in 3 public hospitals provided information on pain characteristics and underwent a clinical examination. QST included temporal summation (TS), conditioned pain modulation (CPM) and pain pressure thresholds (PPTs). Healthy controls (n=25) provided normative QST data. Descriptive statistics and correlations (Spearman Rank Test) were calculated.

Results:*Table 1. Demographic and clinical characteristics*

	Demographics (n=70)
Age $\pm$ SD (years)	64 $\pm$ 7
Female, n (%)	44 (63%)
Obesity, n (%)	35 (50%)
CES-D depressive symptoms, n (%)	26 (37%)
	Clinical Characteristics
Multiple pain sites, ≥ 4 , n (%)	33 (47%)
Median pain duration, (months)	25
Pain intensity on VAS, mean (SD)	5.5/10 (1.5)

Knee OA participants had significantly lower PPTs ($p < 0.05$) locally (knee) and remotely (forearm) compared to healthy controls, inefficient CPM (n=34) and enhanced TS (n=23). Significant negative correlations ($p < 0.01$) were found between QST measures (forearm PPTs and CPM), and widespread pain (recorded on body chart) and a manual tender point count.

Conclusions: A substantial number of patients had features of abnormal pain processing. This research also provides preliminary evidence associating certain QST with clinical pain measures.

EFIC5-0276

Basic Science (Anatomy/physiology/pharmacology/behaviour): Cannabinoids

DRONABINOL INHIBITS NOCICEPTIVE TRANSMISSION IN HUMANS. A DOUBLE BLIND RANDOMIZED CONTROLLED STUDY

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Background and aims: Cannabinoids proved to be effective in several experimental neuropathic pain models, and there is increasing evidence for their use in human neuropathic pain conditions.

In this study we aimed at testing whether dronabinol inhibits nociceptive transmission in humans. To do so we verified whether dronabinol modulates the nociceptive-mediated laser evoked potentials (LEPS).

Methods: We conducted a double blind randomized controlled trial in fourteen healthy volunteers. All subjects underwent two separate sessions: one with 5 mg of dronabinol and the other with 1.5 mg of bromazepam as control drug. The two sessions were randomly alternated among subjects. In each session LEPs were recorded from 32 scalp electrodes after hand stimulation. Each session consisted of two recording blocks: before oral administration of dronabinol or bromazepam and 60 min after dronabinol or bromazepam.

Results: Both the dronabinol and the bromazepam left the LEP latency unchanged. While the dronabinol reduced the N1-, N2-, P2-LEP components ($P < 0.01$), bromazepam did not produce any significant changes.

Conclusions: Our findings show that dronabinol inhibits nociceptive transmission, thus suggesting that it might play an important role in the treatment of neuropathic pain.

CANNABINOID RECEPTOR MEDIATED ACTIVITY-DEPENDENT SUPPRESSION OF EXCITATION AT SPINAL NOCICEPTIVE SYNAPSES IS IMPAIRED BY PERIPHERAL INFLAMMATION

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Background and Aims: Endocannabinoids are well-known retrograde messengers mediating postsynaptic activity-dependent inhibition of synaptic strength in the central nervous system via presynaptic type 1 cannabinoid (CB₁) receptors. These receptors are abundantly expressed at presynaptic sites in the superficial spinal dorsal horn. Here we measured the effect of strong postsynaptic depolarization of superficial spinal dorsal horn neurons on evoked and spontaneous excitatory synaptic activity.

Methods: We performed whole-cell patch-clamp recordings in superficial dorsal horn neurons in a spinal cord slice preparation with dorsal roots attached from young rats. We determined the effect of a strong postsynaptic depolarization on spontaneous (sEPSCs) or on monosynaptic A δ - and C-fiber-evoked excitatory postsynaptic currents (eEPSCs). In some animals Complete Freund's adjuvant (CFA) injection into one hindpaw was used as a model for inflammatory pain.

Results: Depolarization of superficial spinal dorsal horn neurons reduced the frequency but not the amplitude of sEPSCs recorded from these cells under current-clamp and voltage-clamp conditions, respectively, suggesting a presynaptic inhibition. In addition, the amplitude of A δ - and C-fiber-evoked EPSCs were significantly reduced following postsynaptic depolarization. This depolarization-induced suppression of excitation (DSE) was blocked by the application of the CB₁-receptor antagonist AM251. The magnitude of DSE (both, on sEPSCs and eEPSCs) was reduced in animals with a CFA-induced inflammation.

Conclusions: These findings identify an activity-dependent inhibition of the global excitatory input and of the primary-afferent input to nociceptive synapses in the rat superficial spinal dorsal horn which is mediated by presynaptic CB₁ receptors. This DSE is decreased by CFA-induced inflammation.

EFIC5-0125

Clinical pain states: Visceral pain

IN COMBAT SOLDIERS RESTING URINARY METABOTYPES CORRELATE WITH THE DEVELOPMENT OF IRRITABLE BOWEL SYNDROME SYMPTOMS DURING STRESS

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Background/Aims: Combat soldiers are exposed to intense psychological and physical stress, often leading to abdominal pain and symptoms. Large interindividual variability exists in the development of stress-induced gastrointestinal (GI) pain and symptoms also known as Irritable Bowel Syndrome (IBS), but it is unclear whether a unique underlying, predisposing metabolic phenotype (metabotype) exists. Metabonomics is a systems biology approach investigating disease mechanisms, in this case, IBS.

Methods: Urinary metabotyping was conducted on 22 healthy male soldiers at rest and under intense physical and psychological stress during high-intensity combat-training for 6 weeks using gas chromatography-mass spectrometry. Stress was measured by perceived stress scale-10 item questionnaire, and GI pain and symptoms by IBS symptom severity score (IBS-SSS). Subjects were stratified into those with and without an increase in IBS-SSS during combat-training.

Results: Stress scores were higher during combat-training than at rest [p

Conclusions: Intense combat-training resulted in IBS in a subgroup of soldiers with a distinct resting urinary metabotypic signature compared to those soldiers without IBS. Notable metabotypic differences related to amino acids, nucleic acid constituents and microbiome-related metabolites. These data suggest individuals more prone to stress-mediated IBS have an identifiable and predictable metabotype at rest.

EFIC5-0141

Clinical pain states: Visceral pain

CHRONIC PAIN AND PSYCHO-AUTONOMIC DISORDERS IN PATIENTS WITH IRRITABLE BOWEL SYNDROME

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Background and aims. Irritable bowel syndrome (IBS) is a chronic disorder of the gastrointestinal function, characterized by recurrent abdominal pain and altered bowel habits in the absence of detectable organic disease. The purpose of the study was to determine the psycho-autonomic disorders in patients with IBS and their implication in the disease pathophysiology.

Methods. Forty IBS outpatients aged 19-56 and 34 healthy controls aged 20-59 years, completed the Rome III questionnaire (2006) for the diagnosis of IBS, the Autonomic Profile (AP) questionnaire (Moldovanu I. et al, 1994) and the Nijmegen questionnaire (Van Dixhoorn J., Duivenvoorden H.J., 1985). They also performed the hyperventilation and apnea tests to determine the brain response to hyperventilation and the breathing center hypersensitivity.

Results. The patients were classified as IBS with diarrhea (n=16), with constipation (n=13), and mixed (n=11). Compared to control subjects, they showed statistically significant higher values of AP on most scales. Gastrointestinal disturbance (28.2 vs 7.9), chronic pain (21.4 vs 7.3) and anxiety (12.8 vs 4.4) were the most significant disorders in individuals with IBS. Hyperventilation syndrome (Nijmegen score of 23-64 points) was found in 16 (40 %) patients. Hyperventilation test was positive in 38 (95 %) IBS cases. The time limit of voluntary apnea was statistically significant lower in IBS patients compared to control subjects (inspiratory apnea time: 37 vs 52 sec and expiratory apnea time: 22 vs 30 sec).

Conclusions. Anxiety, chronic pain and hyperventilation syndrome are the major psycho-autonomic disorders involved in the pathophysiology of IBS.

A PRO-NOCICEPTIVE PAIN MODULATION PROFILE IS ASSOCIATED WITH ENHANCED CLINICAL SYMPTOMS IN PROVOKED VESTIBULODYNIA AND PAINFUL BLADDER SYNDROME

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Background and aims: Provoked vestibulodynia (PVD) and painful bladder syndrome (PBS) are common chronic pelvic pain syndromes (CPPS). Enhanced pain sensitivity has been demonstrated in these patients. However, a pro-nociceptive pain modulation profile (PMP) associated with the clinical pelvic severity pain among these women has not yet been explored. We hypothesize that enhanced pain facilitation - higher temporal summation (TS) and reduced descending inhibition (less-efficient conditioned pain modulation (CPM)) - will be correlated with clinical measures of CPPS.

Methods: Heat pain threshold (HPT), pinprick scores of mechanical TS (mTS), and conditioned pain modulation (CPM) were tested on the dominant forearms of 18 PVD and 21 PBS patients. Clinical CPPS measures were assessed by pain ratings evoked during trigger point examination, during intercourse and by the Brief Pain Inventory (BPI).

Results: Greater pain ratings of evoked trigger points were associated with enhanced mTS ($r=.335$, $p=0.034$) and less-efficient CPM ($r=.388$, $p=0.019$). Linear regression analyses revealed no effect of sub-group (PBS or PVD). Among PVD women, higher vaginal pain during intercourse was associated with lower HPT ($r=-.504$, $p=0.043$) and enhanced mTS ($r=.504$, $p=0.033$). Additionally, higher BPI scores were correlated with lower HPT ($r=-.326$, $p=0.034$).

Conclusions: These findings reveal that the underlying mechanisms determining pain symptoms in CPPS women are related to pro-nociceptive pain modulation profiles. These are expressed by enhanced activity of the ascending pain pathways and less-efficient responses of the descending inhibitory pain pathways. Both the facilitatory and inhibitory mechanisms affect the clinical severity of CPPS.

PERSONALITY TRAITS ASSOCIATED WITH ILLNESS PERCEPTION AMONG WOMEN WITH CHRONIC PELVIC PAIN SYNDROME (CPPS)

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Background and aims: Pain related personality traits were found to characterize patients who suffer from Painful Bladder Syndrome (PBS) and Provoked vestibulodynia (PVD). This study aimed (1) to characterize the cognitive representations as expressed by illness perception of women who suffer from chronic pelvic pain syndromes (CPPS) and (2) to investigate whether their illness perception is associated with pain related personality features.

Methods: CPPS women (PBS=21 and PVD =18) completed the following questionnaires: Illness Perception Questionnaire Revised (IPQ-R), State Trait Anxiety Inventory (STAI), Pain Catastrophizing Scale (PCS), and the Brief Somatization Inventory (BSI).

Results: Negative illness perception was correlated with higher trait anxiety ($r=0.444$, $p=0.005$), enhanced somatization scores ($r=0.675$, $p=0.000$), and higher depressive symptoms ($r=0.644$, $p=0.000$). Higher scores of pain catastrophizing were associated with lower sense of coherence regarding the syndrome ($r=-.415$, $p=0.009$). Additionally, higher depressive symptoms and pain complains were correlated with higher scores of negative feelings toward their pain. Linear regression ($R^2 = .666$, $p=0.001$) analysis revealed that after controlling for the CPPS sub-groups (PBS or PVD), higher anxiety and somatization but not the level of depression predict greater negative illness perception among these women.

Conclusions: Personality features play a significant role in shaping the cognitive representations of CPP and shape coping strategies of these patients. These findings are pointing towards the role of illness perception as an essential factor in the evaluation and treatment approach offered to PBS and PVD patients.

EFIC5-0566

Clinical pain states: Visceral pain

PAIN SENSITIZATION AMONG WOMEN WITH CHRONIC PELVIC PAIN

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Background and aims

Chronic pelvic pain is a common problem with limited understanding of the mechanisms and treatment. Pain sensitization has not been previously evaluated in chronic pelvic pain. The aim: to determine the frequency and relevance of pain sensitization among women with chronic pelvic pain

Methods

Women with chronic pelvic pain for more than 6 months were clinically evaluated and tested for cutaneous allodynia, myofascial pain and reduced pain thresholds. Frequency of sensitization (allodynia) was determined overall and by clinical diagnosis. Informed consent and ethics approval were obtained.

Results

One hundred and eighty-seven women participated in the study. The overall frequency of sensitization was 68.3 +/- SD 46.7 %. The frequency of visceral pelvic disease from any cause was 61.7% +/- SD 48.8%). Age, gravidity, parity, duration of pain, age at menarche, did not differ among women with or without pain sensitization (N.S.).

Variable	% Sensitized	% Not sensitized	P
Visceral disease	88.7 +/- SD 31.9%	11.8 +/- SD 32.5	<0.001
Continuous pain	72.1 +/- SD 45.1	36.6 +/- SD 48.7	<0.001
Endometriosis/dysmenorrhea history	77.7 +/- SD 41.8	42.3 +/- SD 49.9	<0.001
Endometriosis confirmed	40.2 +/- SD 49.2	17.3 +/- SD 38.2	<0.001
Pain Pressure Thresholds RLQ	104.4 +/- SD 60.2 KPasc	65.7 +/- SD 51.6 KPasc	<0.001
Pain Pressure Thresholds LLQ	101.3 +/- SD 54.9 KPasc	60.4 +/- SD 39.3 KPasc	<.0001

Summary

Pain sensitization is common in chronic pelvic pain, primarily associated with visceral disease, endometriosis, dysmenorrhea and lower abdominal muscle tenderness.

EFIC5-1076

Clinical pain states: Visceral pain

INTRAVESICAL CHONDROITIN SULPHATE FOR INTERSTITIAL CYSTITIS

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Background and Aims: Interstitial cystitis/painful bladder syndrome (IC/PBS) is a chronic inflammatory condition of the bladder. Bladder instillation is one avenue of treatment but evidence for its effectiveness is limited. Chondroitin sulphate solution 2.0% (Urocyst) is a glycosaminoglycan (GAG) replenishment therapy instilled for patients with IC/PBS. We assessed its effectiveness for treating IC.

Methods: Patients were assessed with the O'Leary-Sant interstitial cystitis index score and global response assessment questionnaire prior to commencing treatment. Assessment with questionnaires was performed after 6 treatments (10 weeks) and after 10 treatments (24 weeks). Assessment end points were pain, urgency, symptom score and problem score.

Results: Data was collected on 10 patients, 9 female and 1 male. 6 patients had failed RIMSO-50 dimethyl sulfoxide (DMSO) 50% w/w treatment prior. At baseline the mean pain score was 6.6, urgency score 7.00, symptom score 13.5 and problem score 12.5. After 24 weeks the mean pain score fell to 2.0, urgency score to 1.80, symptom score to 6.89 and problem score to 5.67. At 10 weeks the global response to treatment was 100%. Nocturia was the first symptom to improve with urgency and pain following. No side effects were reported during instillation and all patients tolerated the treatments.

Conclusion: IC is a difficult disease to treat and requires a multimodal approach. We found that intravesical chondroitin sulphate reduced pain, urgency and O'Leary-Sant symptom and problem scores in patients with IC/PBS. All patients tolerated the treatment and no side effects were reported.

PAIN PROFILES OF PATIENTS WITH KNEE OSTEOARTHRITIS – AN EXPLORATORY PILOT STUDY

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Background and aims

The classification of patients in pro- and antinociceptive pain profiles could be useful for individualizing the therapy management of patients with pain. The measurement of temporal summation is one test procedure for the classification of these different pain phenotypes. However, there is no consensus regarding the appropriate cut off score for the determination of the pain profile of an individual patient. The aim of this exploratory pilot study was to develop a classification approach for patients with knee osteoarthritis.

Methods

44 patients (m:16 f:28) with painful knee osteoarthritis, which were scheduled for total knee replacement fulfilled the inclusion criteria. Temporal summation was measured at the forearm of the dominant hand using a von Frey Filament (Aesthesio, No. 6.45) and wind up ratio was calculated. Reference values of 180 healthy pain free subjects published by the German Research Network on Neuropathic Pain were used to define wind up ratio cut off scores for the classification to either a pro- or an antinociceptive pain profile.

Results

Wind up ratio of female patients was $2,6 \pm 1$ (95% CI: 2,2 bis 2,9). 32% of female patients showed a pronociceptive pain profile. Wind up ratio of male patients was $2,0 \pm 0,9$ (95% CI: 1,6 bis 2,5). 25% of male patients showed a pronociceptive pain profile.

Conclusions

The classification approach is promising for determining the pain profiles of patients with knee osteoarthritis.

EFIC5-0407

Clinical pain states: Arthritis

OSTEOARTHRITIS PATIENTS WITH INCREASED TEMPORAL SUMMATION OF PAIN AND IMPAIRED CONDITIONING PAIN MODULATION BEFORE SURGERY HAVE MORE CHRONIC PAIN AFTER TOTAL KNEE REPLACEMENT SURGERY

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Background and aims: In patients with knee osteoarthritis (KOA) facilitated temporal summation of pain (TSP) and impaired conditioning pain modulation (CPM) have been found. The present study investigated if TSP and CPM levels before total knee replacement (TKR) were predictors for the development of post-TKR chronic pain.

Method: In 88 KOA-patients pressure pain detection (PDT) and tolerance (PTT) at the lower leg were recorded using cuff algometry. TSP was assessed as the pain intensity on a visual analogue scale (VAS) during 10 repeated stimulations separated ($\frac{1}{2}$ Hz) at an intensity equivalent with the mean of PDT and PTT. CPM was recorded with conditioning tonic arm pain and re-assessment by cuff algometry at the lower leg. The grand-average of TSP and CPM was calculated. TSP and CPM below or above the grand-average was defined as low or high. Patients were divided into groups as high-TSP/low-CPM (Group1 [N=11]), high-TSP/high-CPM (Group2 [N=14]), low-TSP/low-CPM (Group3 [N=39]) and low-TSP/high-CPM (Group4 [N=24]). Clinical pain was collected as pre- and one year post-TKR-surgery VAS. A reduction in pain was used as outcome measure.

Results: VAS scores at pre-TKR-surgery was comparable for all groups: Group1: 6.6 ± 1.8 , Group2: 6.6 ± 1.7 , Group3: 6.8 ± 1.7 , Group4: 5.8 ± 1.8 . Less reductions in VAS was found in Group1 ($50 \pm 10\%$) post-TKR-surgery compared with Group2 ($80 \pm 9\%$, $P < 0.05$) and Group3 ($80 \pm 5\%$, $P < 0.05$) but not Group4 ($70 \pm 7\%$, $P < 0.09$).

Conclusion: KOA-patients with facilitated TSP and impaired CPM have less pain reduction after TKR-surgery suggesting cuff algometry as a new pre-operative profiling tool to determining patients in risk to develop chronic post-operative pain.

PRE-OPERATIVE NEUROPATHIC PAIN PREDICTS POOR OUTCOME FOLLOWING ARTHROPLASTY FOR KNEE OA.

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Background and aims: Although joint replacement surgery is effective, around 20% of patients experience persistent pain. The aim of this study was to determine if neuropathic features in patients with knee osteoarthritis (KOA) prior to joint replacement surgery predicted short-term outcome following surgery.

Methods: Patients with primary KOA, listed for primary knee replacement surgery, were recruited to this longitudinal, observational cohort study. PainDETECT was used pre-operatively to identify those with neuropathic (≥ 18), unclear (13-17) and nociceptive pain (< 13). Oxford Knee Score (OKS), disease specific measure of severity, (0-19: severe disease); McGill Pain Questionnaire (SF); Hospital Anxiety and Depression Scale; Pain Catastrophizing Score; Pain Disability Index; and Quantitative Sensory Testing were also completed. Follow-up OKS was collected 2 months post-operatively. Differences between the nociceptive and neuropathic groups were tested using Student's t-test (normal), Mann-Whitney-Wilcoxon test (non-normal).

Results: 118 patients were recruited (mean age 71(9) years, 59 (50%) females), with follow-up data in 77 participants. 25 (21.2%) had neuropathic pain pre-operatively, with significantly ($p < 0.05$) more severe disabling symptoms and psychological distress (figure 1), and increased sensitivity to heat/mechanical stimuli at local/regional sites (figures 2, 3) than the nociceptive group. The neuropathic group had statistically and clinically significant worse post-operative OKS than the nociceptive group (mean 30.0(10.2) versus 36.2(8.4), $p = 0.035$).

Conclusions: This preliminary study identified neuropathic pain in a sub-group of KOA patients awaiting arthroplasty, with significantly worse outcome post-operatively. Current surgical pathways do not address this patient group and targeting established psychological intervention to this high-risk group might improve their outcomes.

Figure 1

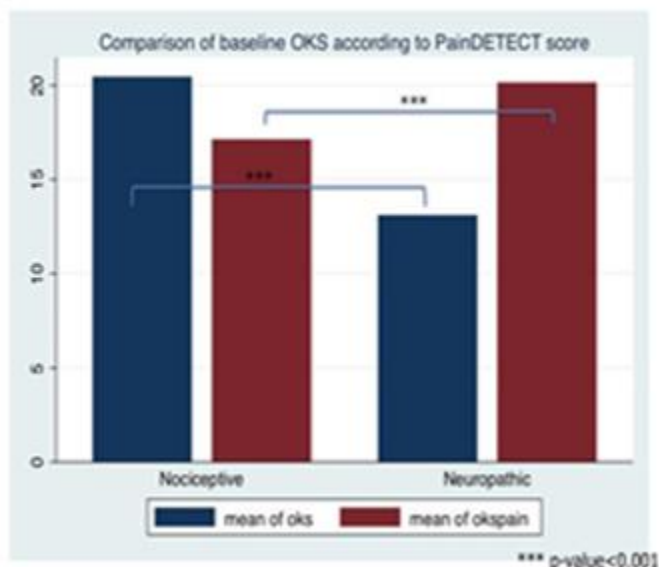


Figure 1

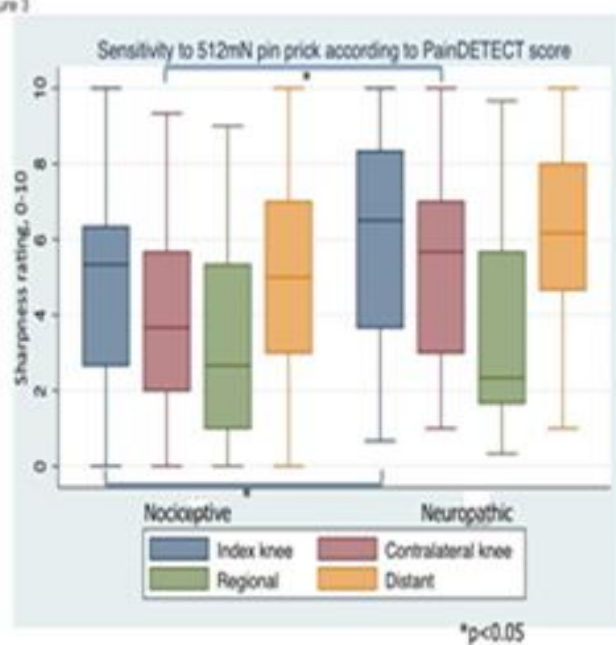
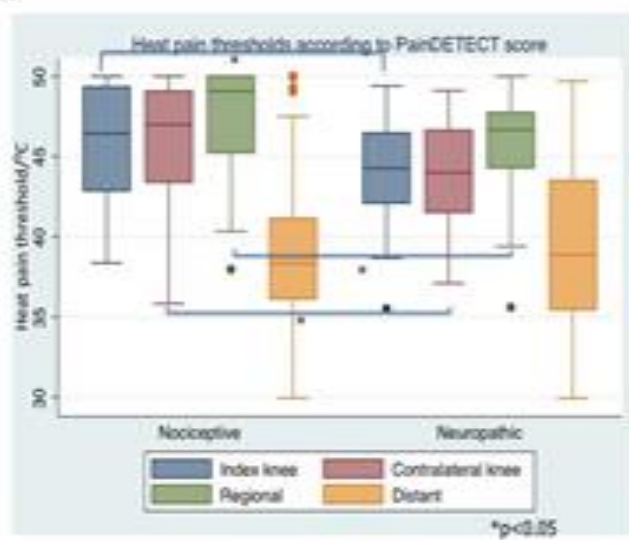


Figure 2



EFIC5-0656

Clinical pain states: Arthritis

**A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED 2-WAY Crossover
CLINICAL EXPERIMENTAL STUDY TO INVESTIGATE THE MECHANISM OF ACTION OF
ETORICOXIB IN PATIENTS WITH KNEE OSTEOARTHRITIS**

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Background and aim: The aim was to investigate the peripheral and central mechanism of action of the COX-II inhibitor etoricoxib in patients with painful knee osteoarthritis by assessing experimental pain measures of pressure pain sensitivity (local and spreading sensitization) and temporal summation (TS).

Method: A total of 37 patients with knee OA were randomized into sequence 1 (60 mg/day etoricoxib following placebo) or sequence 2 (placebo following 60 mg/day etoricoxib). The two treatment periods of 4 weeks were separated by a washout period of at least 6 days. Pressure pain thresholds (PPT) from the knee and the tibialis anterior (TA) were assessed. TS was assessed to 10 repeated ($\frac{1}{2}$ Hz) mechanical pressure stimulations at the PPT level on the knee and TA. Clinical pain was assessed by a visual analogue scale (VAS). All measurements were measured before and after treatment. The primary endpoint was a pain reduction and responders were identified as a minimum of 30% pain reduction.

Results: PPTs were elevated and TS reduced ($P < 0.05$) by etoricoxib as compared with placebo. 21 patients were classified as responders and 16 patients as non-responders. Correlations between pain reduction and TS at the knee ($r = -0.441$, $P = 0.087$) and TA was found ($r = -0.691$, $P = 0.003$) for non-responders.

Conclusion: The present study showed that etoricoxib modulated localized and spreading sensitization and temporal summation in patients with painful knee osteoarthritis compared to placebo. Further, the negative correlation between pain reduction and TS for non-responders indicates that temporal summation must be fully manifested for a good response to etoricoxib.

EFIC5-0894

Clinical pain states: Arthritis

COMPARATIVE ANALYSIS OF ARTHRITIS DURATION AND INFLAMMATION AMONG GOUT PATIENTS WITH NEPHROLITHIASIS IN YAKUTIA

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Introduction. Gout is considered a metabolic disease and ranked among the diseases connected with obesity, such as an arterial hypertension (AH), coronary artery disease (CAD), stroke, and type 2 diabetes mellitus (WHO, 2000). A research project has been initiated to determine the incidence and characteristics of gout in Yakutia from 2007-2012. Patients hospitalized in the department of rheumatology of Yakut City Hospital with gouty arthritis were studied.

Methods. Patients are being studied by means of a questionnaire developed by the Institute of Rheumatology (Moscow). Data also being collected include: laboratory measures, radiographic assessment of feet and wrists; ultrasound of kidneys.

Results. 42 patients were registered and divided into two groups: 1st with nephrolithiasis (9 patients) and 2nd – without (33 patients). Median age of the subjects is 56,6 [52; 60] vs. 51,2 years [35; 77], respectively. Duration of the last exacerbation of joints is 7 [1; 18] and 5,5 [1; 6] weeks. Inflammation of the joints in 1st group is 55% vs. 40%. Duration of arthritis is 46 (6-140) vs. 32 (2-77) days. Accompanying pathology includes: CAD in 12 patients (44% vs. 24 %), AH in 28 (100% vs. 58%), HF in 6 (22% vs. 12%), chronic renal insufficiency in 3 (22% vs. 3%).

Conclusion. Gout patients with nephrolithiasis have more prolonged exacerbation with joints inflammation, more CAD, AH, HF, chronic renal insufficiency.

EFIC5-0900

Clinical pain states: Arthritis

ASSOCIATION OF THE PAIN, CIRCUMFERENCES OF THE WAIST AND QUALITY OF LIFE AFTER ARTHROPLASTY BECAUSE OF KNEE OSTEOARTHRITIS

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Background and aims. Osteoarthritis of the knee is one of the leading causes of pain and disability. The pain is the important part of the quality of life of patients with severe knee osteoarthritis and patients with total knee arthroplasty. The aim of this study was to investigate the association of the pain with age, body mass index, circumferences of the waist and quality of life in early period after arthroplasty because of knee osteoarthritis.

Methods. This is clinical prospective randomized study of 97 patients with average age $67, 5 \pm 9, 2$ years with diagnosis of osteoarthritis of the knee that underwent total knee arthroplasty. The pain and quality of life was measured preoperatively and 6 weeks after arthroplasty by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Linear regression was used to analyze numerical data.

Results. Results of our research show that the pain intensity in the patients with knee osteoarthritis and arthroplasty in early stage after arthroplasty was statistically significantly associated with waist circumferences ($t=3,201, p=0.002$) and quality of life measured by WOMAC index preoperatively ($t=10,748, p=0, 000$) when controlled with parameters of the age, body mass index, circumferences of the waist and quality of life.

Conclusions. The results of our study suggest that the pain in patients with knee osteoarthritis was significantly associated with quality of life preoperatively and waist circumferences in early period post arthroplasty. These results may help in prevention and therapy of the pain in patients with knee osteoarthritis.

EFIC5-0934

Clinical pain states: Arthritis

KINESIS TRAINING AS AN ALTERNATIVE TREATMENT MODALITY IN PALINDROMIC RHEUMATISM: CASE REPORT

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Background and aims:

Palindromic rheumatism (PR) is a syndrome of intermittent abrupt onset poliartthritis with asymptomatic intercritical periods of variable duration, which commonly evolves into rheumatoid arthritis. NSAIDs, steroids and methotrexate are the treatment modalities for pain. Kinesis is a novel exercise system conducting various movements in nearly any direction without compromising resistance load. We present two cases in which joint pain resolved and medication requirements decreased with kinesis training.

Methods:

Case1: A woman, aged 37 diagnosed with PR for 2 years had been subject to occasional attacks of persistent pain, functional disability, and swelling in the joints. She was on intermittent NSAIDs and continuous 10mg/day prednisolone treatment. Two weeks after starting kinesis (3 times weekly) she entered a painless period.

Case2: A 28 year old male with PR, who suffered 50 attacks of arthritis per year over the past 5 years. He was on methotrexate 5mg/week for six months. Three weeks after starting kinesis (3 times weekly) he entered a painless period.

Results:

The first case was off the steroid and NSAIDs therapy without any pain. She is currently on remission 10 months. In second case methotrexate was stopped 2 months after he started kinesis. He is currently on remission in the last 20 months.

Conclusion:

Chronic arthritis pain, results in high levels of suffering and reduced quality of life. Management of chronic pain is complex, time consuming and not always successful. Exercise programs are effective as adjunct therapy in the management of arthritis pain. These two cases show the need for a clinical study regarding kinesis in treatment for PR pain.

ANTIMICROBIAL ACTIVITY OF LIDOCAINE, BUPIVACAINE, MEPIVACAINE AND ROPIVACAINE ON STAPHYLOCOCCUS EPIDERMIDIS, STAPHYLOCOCCUS AUREUS AND BACILLUS SUBTILIS

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Introduction

Various studies have shown a possible antimicrobial activity of different local anaesthetics, which may affect results in microbial assessment of biopsies. The purpose of this study was to test the antimicrobial activity of different commonly used anaesthetic agents on *Staphylococcus epidermidis*, *Staphylococcus aureus* and *Bacillus subtilis*.

Methods

Local anaesthetics tested were commercially available solutions of lidocaine, bupivacaine, mepivacaine and ropivacaine. Equal portions of bacterial dilution and 10 µl of different local anaesthetic dilution placed on wafers were added to Mueller Hinton Agar and cultured at 35°C. After 24 hours, a zone of inhibition around the wafers was evaluated.

Results

Local anaesthetics in different concentrations did not show any zone of inhibition on *Staphylococcus epidermidis*, *Staphylococcus aureus* or *Bacillus subtilis*. Tests were repeated with undiluted local anaesthetics but with lower densities of microorganisms. After culturing for 24 hours at 35°C there again was no zone of inhibition on tested bacteria.

Discussion

Considering the literature, antimicrobial activity of local anaesthetics could lead to false-negative results in microbial assessment of biopsies. However, different studies showed that local anaesthetics did not have any antimicrobial effects. Due to these inconsistent results this study was conducted to evaluate the antimicrobial effects of different commonly used anesthetic agents.

Conclusion

Neither lidocaine, bupivacaine, mepivacaine nor ropivacaine showed an antibacterial effect on *Staphylococcus epidermidis*, *Staphylococcus aureus* and *Bacillus subtilis*. Due to these findings local anaesthetics can be used in clinical routine to perform pain free diagnostic procedures in which culture specimens are to be obtained.

INTRAFASCICULAR LIDOCAINE DYS-REGULATE SODIUM CHANNEL EXPRESSION IN SCIATIC NERVE AND DORSAL ROOT GANGLION

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Background and aims: peripheral neuropathy is closely associated with dysregulate sodium channels (Navs) expression. Whether unintentional intrafascicular lidocaine damages nerve and induces abnormal Navs expression is undetermined. The aim is to investigate injured sciatic nerve segments and dorsal root ganglion (DRG) Navs expression following lidocaine intrafascicularly and assessing through hindpaws evoked stimuli and glial cells activation in spinal dorsal horn (SDH).

Methods: Sprague-Dawley rats were divided into two groups: (1) naïve group; (2) experimental group, 0.1 ml 2% lidocaine left sciatic nerve intrafascicular injection. Following injection, Behavioral responses to thermal and mechanical stimuli, Navs expression in left sciatic nerve segment and DRGs, and glial cells activation in SDH were measured following post-injury 6, 12, 24, 36, 48 hours, and 3, 7, 14 days (P6h, P12hr, P24hr, P36hr, P48hr, and P3D, P7D, P14D), respectively .

Results: In experimental rats, Navs significantly up-regulated expression in injured sciatic nerve segment within P24hr. Up-regulated Nav1.3 and down-regulated Nav1.8 in DRGs at P36hr was observed. However, only the Nav1.8 lasted its abnormal expression for P14D. Intrafascicular lidocaine increased mechanical sensitivity rapidly at P6hr and lasted for P14D. Activated microglia increased intensity on P3D, to reach its peak on P7D then returned to normal level on P14D.

Conclusion: Intrafascicular lidocaine induced dysregulated Navs expression in injured sciatic nerve segment and DRGs. It presented hindpaws shorten mechanical responses and SDH increased activated microglia cells. It demonstrates intrafascicular lidocaine induced neuropathy by down-regulated expression of Nav1.8 in injured DRGs and increased intensity of activated microglia in SDH.

PSYCHOPATHOLOGICAL MODEL OF THE EFFECT OF CORTICOSTEROIDS ON PAIN AMONG PEOPLE WITH CHRONIC PAIN AND PSYCHOLOGICAL COMORBIDITY

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Background and Aims: The current paper proposes a pathophysiological model describing the mechanism by which psychological distress influences the effectiveness of corticosteroid injections in people with chronic pain. The model incorporates the effects of pre-morbid distress (e.g. early life stress) and psychological distress resulting from chronic pain.

Methods: A narrative review was conducted of available literature using the following databases: Medline, CINAHL, EMBASE, and PsycInfo. Grey literature including Cochrane Database of Systematic Reviews and Clinicaltrials.gov was also examined. Keywords included: hypothalamic pituitary adrenal axis, chronic pain, and corticosteroids. Included literature was used to develop a model to explain the mechanism by which psychological distress may influence the effectiveness of corticosteroids in reducing pain intensity.

Results: The model predicts that corticosteroids may be less effective in people with chronic pain and pre- or co-morbid psychological distress due to either decreased receptor sensitivity among those with exaggerated HPA axis activity due to stress, or increased negative feedback at the pituitary level in those with retarded HPA activity (relative hypocortisolism).

Conclusions: Clinical implications of the model include a more in-depth understanding of the limitations of corticosteroids and optimal management plans for individuals with psychological distress. Future research involving clinical trials with adjunct antidepressant treatment and psychotherapy may be warranted.

EFIC5-0316

Clinical pain states: Pain and dementia

DEVELOPMENT OF AN OBSERVATIONAL BACK PAIN SCALE FOR PERSONS WITH COGNITIVE IMPAIRMENT

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Background and aims:

Back pain represents a substantial burden for elderly persons. Hereby, individuals with dementia are not excluded, who can unfortunately not properly be assessed due to the lack of any observational tool for this population. Thus, the aim of this study is to develop an observational scale for back pain in persons with dementia.

Methods:

The first step of the scale development, the generation of the primary item pool, is described here. Different methods were applied to detect appropriate observational items for back pain behavior in this population. First, the existing literature was evaluated using Medline. Second specialized physiotherapists and experts on the assessment of pain in dementia were consulted. Third, guidelines regarding pain assessment in older persons were reviewed. Finally, existing self-report back pain scales and observational pain scales were reviewed.

Results:

The item pool consists of twenty-eight items, grouped in six specific subcategories: muscular defence, body positions and postures, reactions due to palpation or tests on the spine or paravertebral muscles, reactions due to movements, muscle stiffness and changes in movement patterns and intensification of paratonia.

Currently an international survey is being circulated among back pain experts to select the appropriate items for a preliminary scale, which has to be tested thereafter (reliability, consistency, factor structure)

Conclusions:

The next steps in development of the observational back pain scale will be validation and integration into the Pain and Impaired Cognition (PAIC) toolkit as PAIC-back pain scale.

Acknowledgements

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EFIC5-0423

Clinical pain states: Pain and dementia

IMPLEMENTATION OF OBSERVATIONAL PAIN MANAGEMENT PROTOCOL TO IMPROVE PAIN MANAGEMENT FOR LONG-TERM INSTITUTIONALIZED OLDER CARE RESIDENTS WITH DEMENTIA: A PILOT STUDY

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Background: Systematic use of observational pain tools has been advocated as a means to improve pain management for care home residents with dementia. The Observational Pain Management Protocol (Protocol) was therefore developed. This study aims to investigate the extent to which the implementation of this Protocol can improve pain management in care home residents with dementia in terms of decreased observational pain scores and increased use of pharmacological and non-pharmacological interventions.

Methods: two-group pre and post comparison was used in this pilot study. 25 residents from two nursing homes were assigned to the experimental group whereas 17 residents from another two nursing homes were allocated to the control group. The protocol guide the pain management of the participants in the experimental care homes for three months whereas participants in the control care home received the usual pain management.

Results: The regular use of the Protocol improved pain management for residents with dementia over time as supported by increased usage of non-pharmacological interventions in comparison with the control care home. As pain relieving interventions increased in the experimental care homes, a significant reduction on observational pain scores were observed in them but not in the control care homes. However there was no significant difference in the usage of analgesic between the control and the experimental care homes.

Conclusion: The study showed preliminary evidence that the management of pain for residents with dementia can be improved by the adaptation of the observational pain management protocol as a daily routine.

EFIC5-0010

Clinical pain states: Neck and back pain

PARAVERTEBRAL BLOCK FOR MULTIPLE CERVICAL DISCOPATHY, SPINAL STENOSIS, BRACHIAL PLEXOPATHY - CASE REPORT

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Objectives. A case of successful treatment of multiple cervical discopathy, spinal stenosis and brachial plexopathy with paravertebral block presented.

Materials and methods. 34 years old male with intractable right neck and arm pain which was scheduled to the surgical treatment due to the multiple cervical discopathy entered in our clinic for temporary pain relief. On MRT films has been shown C3, C4 intervertebral discs protrusions and C5, C6 intervertebral discs prolapse 4 mm, spinal stenosis. Right cervical paravertebral block has been suggested and informed consent received.

Results and discussion. On a patients sitting position nerve stimulatory guided right side cervical paravertebral (posterior interscalene) block performed. Response to nerve stimulation has been received only with 3.2 ma 2 hz impulse (nerve stimulator - stimuplex HNS 11, stimulation needle - contiplex D 110 mm, BBraun, Germany). Due to existed neuropathy this response has been accepted as an adequate for nerve block and 40 ml of 0.25% naropine and 8 mg dexamethazone had been injected and catheter inserted for continuous analgesia. After 15 min pain completely relieved. No additional pain relief and local anesthetics injection was needed. On day three plexus catheter removed. Patient was pain free after six months of single paravertebral block, no signs of brachial plexopathy and no surgery.

Conclusion. Cervical paravertebral block can result in long term pain relief in patients with multiple cervical discopathy, plexopathy and spinal stenosis. In some cases it can avoid the need of surgery.

LOW BACK PAIN IN PTSD PATIENTS: QUALITY AND INTENSITY OF PAIN EXPERIENCE

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The aim of this study was to analyze the association between chronic low back pain (LBP) in chronic post-traumatic stress disorder (PTSD) with quality and intensity of pain experience. A total of 406 war veterans from 1991-1995 war in Croatia participated in this study. They were divided into four groups, according to psychiatric interview, psychometric testing and the presence of LBP, verified by the imaging of lumbar area, into: (i) war veterans suffering from PTSD and LBP (N = 102), (ii) war veterans suffering from PTSD only (N = 108), (iii) war veterans suffering from LBP only (N = 99) and (iv) healthy controls (N = 97). On the basis of medical records, interviews and different types of self-assessment questionnaires the inter-relationship between chronic pain and chronic PTSD was analysed. PTSD was assessed by TSI-A (Trauma symptom Inventory), whereas pain was measured by Melzack-McGill Pain Questionnaire—short form (MPQ-SF) and Visual Analogue Scale (VAS). The patients with chronic PTSD had significantly higher total pain scores as well as affective and sensory pain components when compared to the patients without PTSD. No significant association was found between chronic LBP and symptoms of PTSD. Chronic LBP as functional painful syndrome in PTSD could be result of altered neuroanatomical and neurophysiological pain pathway and one of the markers of PTSD.

CENTRAL PAIN MODULATION AND COGNITIVE FUNCTIONING IN PATIENTS WITH TRAUMATIC AND NON-TRAUMATIC CHRONIC NECK PAIN: PRELIMINARY RESULTS

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Background Scientific evidence demonstrates the presence of central sensitization (CS) and cognitive deficits in patients with chronic whiplash associated disorders (CWAD). To date, research regarding central pain modulation and cognitive performance in chronic non-traumatic neck pain patients is lacking.

Aims To examine central pain modulation and cognitive functioning in CWAD and chronic idiopathic neck pain patients (CINP) compared to healthy individuals.

Methods Forty-four women (15 CWAD, 15 CINP, 14 pain-free controls) were enrolled. First, participants completed the modified Perceived Deficits Questionnaire (mPDQ). Subsequently, they performed the Trail Making Test (TMT). Afterwards, pressure pain thresholds (PPTs), and conditioned pain modulation (CPM) were evaluated.

Results Decreased PPTs were shown at the Trapezius, Quadriceps and lumbar region in CWAD ($p < 0.05$) and at the Trapezius in CINP ($p = 0.047$), compared to healthy women. PPTs increased significantly during the cold pressor test in the CINP ($p < 0.05$) and control group ($p < 0.001$). However, PPTs remained the same during this CPM paradigm in CWAD patients ($p > 0.05$).

CWAD patients reported more self-perceived cognitive deficits (mPDQ) and displayed diminished psychomotor speed (TMT A) compared to CINP and controls ($p < 0.01$). However, decreased task-switching performance was found in both CINP and CWAD ($p < 0.05$) (TMT B).

Conclusions Primary hyperalgesia was demonstrated in traumatic and non-traumatic neck pain patients. However, secondary hyperalgesia and decreased CPM efficacy was shown in CWAD but not in CINP, which is indicative for the presence of CS in CWAD patients. Additionally, the results provide preliminary evidence for cognitive deficits in CWAD and to a lesser extent in CINP patients.

DEPRESSION AND PESSIMISM AND THEIR CORRELATION WITH PAIN AND DISABILITY AFTER LUMBAR MICRODISCECTOMY

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Background. Lumbar microdiscectomy is one of the surgical methods for the treatment of low back pain caused by herniated lumbar discs. However, certain psychological predispositions, such as depression and pessimism, may influence to poor clinical outcomes. **The aim** was to determine the impact of depression and pessimism on pain intensity and disability after microdiscectomy. **Methods.** The study was performed after lumbar microdiscectomy in 200 patients (96 men and 104 women) mean age 50.20 ± 10.26 years. For examinations were used the following questionnaires: for depression - Beck Depression Inventory; for own expectation of recovery; for intensity of back and leg pain - visual analogue scale (VAS); for neuropathic component of pain - Pain Detect; for functional disability Oswestry Low Back Pain Disability Questionnaire. These assessments were carried out after microdiscectomy: just before the rehabilitation treatment, one month later and then 3 and 6 months after microdiscectomy.

Results. Pain and functional disability were significantly associated with high degree of depression (p<0.05). **Conclusion.** On the pain intensity and functional disability of the patients after lumbar microdiscectomy, significant influences have depression and pessimistic attitudes about recovery. Registering mentioned factors it is possible to predict the degree of functional recovery and if necessary to apply additional psychological and cognitive-behavioral treatment.

VISUAL STRESS AND NECK PAIN

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Background and aims: Eyestrain during computer work is related to pain in the neck and shoulder area, and there is shown an association between sustained eye-lens accommodation at near and trapezius muscle load. This study aimed to investigate the associations between eyestrain, neck, shoulder and upper back pain, muscle load and muscle blood flow in m. orbicularis oculi and m. trapezius.

Methods: Fifteen healthy subjects (range 19 – 25 years) with no vision anomalies were included. All testing was carried out at an optimized computer work place. The assignment was to read a text on a computer screen for 30 min with optimal lighting and 30 min with exposure to glare. During testing muscle load and muscle blood flow was measured in orbicularis oculi and trapezius using electromyography and photoplethysmography, respectively, together with measurements of postural angles. Subjective symptoms were registered on Visual Analogue Scales (VAS).

Results: Reading on a computer screen with exposure to glare compared to reading in optimal conditions, affected the computer worker by significantly increased eyestrain, orbicularis oculi muscle activity and trapezius muscle blood flow, without significant differences in postural angles. There were significant positive correlations between eye-related symptoms and pain in the neck and upper back, and between muscle load in orbicularis oculi and trapezius muscle blood flow and neck pain.

Conclusions: This study indicate a direct or indirect connection between squinting due to glare and stabilizing head muscles, independent of changes in postural angles.

EFIC5-0212

Clinical pain states: Neck and back pain

CORRELATION BETWEEN VOXEL-BASED MORPHOMETRIC VALUES OF THE BRAIN AND PAIN ASSESSMENT SCALE SCORES IN PATIENTS WITH CHRONIC LOW BACK PAIN

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Background and aims: Voxel-based morphometry (VBM) is a diagnostic imaging technique to analyze brain morphology. Decreased gray matter volumes in brain regions related to pain recognition, such as the anterior cingulate gyrus; those related to emotional responses to pain, such as the amygdala, insula, and parahippocampal gyrus; and those related to pain suppression, such as the ventromedial prefrontal cortex and nucleus accumbens, have been reported in a number of patients with chronic pain. In this study, morphological changes in the brain were examined using VBM, and pain assessment was conducted using the PDAS (Pain Disability Assessment Scale), PCS (Pain Catastrophizing Scale), and HADS (Hospital Anxiety and Depression Scale), in 23 patients with chronic low back pain. Our purpose was to determine the relationship between such brain changes and scores from each scale.

Methods: Morphological changes in the brain were analyzed using VBM, and the patients were asked to complete each pain assessment scale during an outpatient consultation.

Results: Morphological changes in the anterior cingulate gyrus were correlated with PDAS scores.

Conclusion: The anterior cingulate gyrus is an important pain-related region associated with anxiety and emotional responses to unpleasant stimuli. The possibility of it being closely involved in prolonged pain and related emotional changes in patients with refractory pain has been suggested. The results of this study suggest that the anterior cingulate gyrus may be useful in the determination of treatment strategies.

EFIC5-0228

Clinical pain states: Neck and back pain

EFFECTIVENESS OF NEW ELABORATED CRANIAL ELECTROSTIMULATION DEVICE FOR LOW BACK PAIN TREATMENT

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Aim of investigation:

To determine the safety, efficacy and decrease in pain level in patients suffering from low back pain, by using a new elaborated cranial electrostimulation (CES) device.

Methods:

The sample size included 30 subjects with low back pain with a pain history > 3 months and a pain level ≥ 4 . The study was open label. The participants received two cycles, which consisted of 5 daily 50 minute treatments with 2 days interval. Visual scales included: pain level, walking test, and physician's and self- assessment. Assessments were completed 1 week prior to treatment, immediately after each cycle and 2, 4, 8 and 12 weeks after treatment. Additional measurements included: Roland Morris Disability Questionnaire and medication usage log.

Results:

Pain level decreased statistically significantly after 5 treatments, was stable during the treatments and throughout the follow up periods up to 3 months. The percent of responders – patients who demonstrated $\geq 50\%$ improvement rate after 10 treatments was 76.7%. During and upon the completion of CES treatments there was a statistically significant improvement of the patient's general condition and a decrease in the severity of the symptoms of disability associated with low back pain. No serious adverse events were noted.

Conclusions:

New elaborated CES device is safe and effective for the treatment of pain associated with osteoarthritis.

DEVELOPMENT OF A RELIABLE CORE STABILITY ASSESSMENT BATTERY FOR PATIENTS WITH NON-SPECIFIC LOW BACK PAIN

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Background and aims

Studies suggest that core stability exercises may improve function and decrease pain in patients with non-specific low back pain (NSLBP). Reliable clinical tests are required for implementing adequate rehabilitation and for evaluating these intervention results. The aim was to examine the test-retest reliability of core stability related tests and develop a reliable core stability assessment battery.

Methods

This study had a test-retest design. Thirty-three different tests that may relate to core stability were identified with their mostly used protocols. Five different components of core stability including endurance, flexibility, strength, functional performance, and motor control were assessed in 38 patients with NSLBP. The same testing session was performed again after 48–72 hours. Intra-class correlation coefficients (ICC), standard error of measurement, minimal detectable change were calculated to assess the intra-rater reliability.

Results

The test-retest reliability of the tests ranged little to very high (ICC=0.08–0.98). Partial curl-up (ICC=0.90), lateral bridge (ICC=0.95–0.96), trunk flexor endurance (ICC=0.97), sit-and-reach (ICC=0.98), single-legged hop (ICC=0.98–0.97), lateral step-down (ICC=0.93–0.92), eyes open right-left leg unilateral stance (ICC=0.97–0.91) tests had the highest intra-rater reliability for each core stability component.

Conclusions

The results indicated that the partial curl-up test (strength), side bridge and trunk flexor tests (endurance), sit-and-reach test (flexibility), single-legged hop, and lateral step-down (functional), unilateral stance test with eyes open (motor control) had very high intra-rater reliability. A core stability assessment battery including these tests can be used in patients with NSLBP to assess all components of core stability.

EFIC5-0244

Clinical pain states: Neck and back pain

ANGULAR MISMATCH IN TOTAL LUMBAR DISC REPLACEMENT (T-LDR) AFFECTS STABILITY OF LUMBAR SPINE ACCORDING TO ANALYTIC THEORY

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Background: Angular mismatch is common in Total- Lumbar Disc Replacement. Studies have shown that this does not affect clinical outcome. However, its effect on biomechanics of lumbar spine is not studied.

Method: We applied analytic theory to study the deviation in lumbar spine's vertebrae resulting from angular mismatch in Total-Lumbar Disc Replacement

Result: Results show that there is asymmetric displacement of vertebrae and is more significant from a mismatch of 4° and above.

Conclusion: Angular mismatch in Total-Lumbar Disc Replacement causes instability of lumbar spine and may cause another episode of Low Back Pain in future due to changes in the biomechanical loading.

EFIC5-0253

Clinical pain states: Neck and back pain

CLINICAL OUTCOME OF INTRADISCAL PULSED RADIOFREQUENCY CORRELATED TO PARAESTHESIAS MAPPING OF PAINFUL INTERVERTEBRAL DISC

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Aims. Intradiscal Pulsed Radiofrequency is a promising mini invasive procedure for chronic disabling

discogenic axial low back pain. It uses a monopolar pulsed electric field from the center of the nucleus pulposus to relieve pain of degenerative disc disease. We have compared the clinical outcome of axial low back pain and paraesthesias mapping obtained with sensitivity stimulation of intradiscal pulsed radiofrequency treatment.

Methods. Eighteen consecutive adult patients with low back pain were evaluated. For each one and every vertebral level before I-PRF treatment (1200 sec at 42 °C) we mapped by paraesthesias elicited with sensitive stimulation at 50 Hz to reproduce the most possible area of low back pain. Clinical outcome was evaluated until 6th month with a numeric rating scale (NRS) for pain, the Oswestry Disability Index (ODI) for disability, reduction of analgesic consumption and program of physical therapy.

Results. NRS and ODI scores were significantly decreased when compared to the baseline values at 3 and 6 months of follow-up. A direct correlation was documented between stimulation of the target disk concordant with area of low back pain and mid long-term effects on pain relief.

Conclusions. Intradiscal Pulsed Radiofrequency is a promising mini invasive and always repeatable procedure for low back pain of disk origin. It is important to search for the exact position of needle point inside disk obtained with fluoroscopy but also with paraesthesias stimulation to gain clinical results as well as for further studies to explore the mechanism of action of the Intradiscal Pulsed Radiofrequency.

FACTORS ASSOCIATED WITH INCREASED RISK FOR CLINICAL INSOMNIA IN PATIENTS WITH CHRONIC NECK PAIN

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Background: Insomnia is highly prevalent among people with chronic pain conditions. Because insomnia has been shown to worsen pain, mood, and physical functioning, it could negatively impact the clinical outcomes of patients with chronic pain. The purpose of this retrospective study was to determine risk factors associated with clinical insomnia based on ISI scores in CNP patients.

Methods: Data from 218 CNP patients were analyzed in this study. The Insomnia Severity Index (ISI) was used to determine the presence of clinical insomnia (ISI score ≥ 15). Patient demographics and pain-related factors were evaluated with logistic regression analysis to identify risk factors of clinical insomnia in CNP.

Results: In total, 53.7% of patients reported mild to severe insomnia after neck pain development; 22.9% of patients met the criteria for clinically significant insomnia (ISI score ≥ 15). In multivariate analysis, high pain intensity, the presence of comorbid musculoskeletal pain, and a high level of depression were strongly associated with clinical insomnia in patients with CNP. Among these factors, a greater level of depression was the strongest predictor of clinical insomnia, with the highest odds ratio of 3.689 (95% CI 1.570-8.667).

Conclusions: Insomnia should be addressed as an indispensable part of pain management in CNP patients with these risk factors, especially depression.

EFIC5-0308

Clinical pain states: Neck and back pain

THE COMPARISON OF LIMITS OF STABILITY IN CHRONIC LOW BACK PAIN (CLBP) PATIENTS AND HEALTHY SUBJECTS

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Background and aims: Pain, impaired proprioception and delayed trunk muscle response are associated with altered postural control in patients with chronic low back pain. The aim of the study was to compare the limits of stability in chronic low back pain patients and healthy subjects.

Methods: Twenty one participants with nonspecific CLBP (age=45.7±7.9) and 21 healthy matched individuals (age=45.0±5.6) were assessed during bilateral stance using the Biodex Balance System. The overall limits of stability index, anterior, posterior, right and left side limits of stability indexes were recorded as measures of postural control. Limits of stability was assessed in standing on rigid surface with eyes open. At the beginning of test session, chronic low back patients rated their back pain using Visual Analogue Scale (VAS). Mann Whitney U test was used for data analysis.

Results: There were no significant differences in age and body mass index between the groups ($p>0.05$). Overall, anterior and mediolateral limits of stability scores were not significantly different between both groups ($p>0.05$). Participants with CLBP (VAS=7.0) had poorer posterior postural sway than healthy subjects ($p=0.038$).

Conclusions: The present study showed that being in pain doesn't affect the limits of stability in subjects with CLBP. This result may indicate chronic low back pain could lead to a less variable limits of stability and patients with CLBP have difficulty maintaining their limits of stability in the posterior direction.

CORRELATION BETWEEN PAIN, DISABILITY, LUMBAR RANGE OF MOTION AND TRUNK MUSCLES ENDURANCE IN NON-SPECIFIC LOW BACK PAIN PATIENTS

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Background and aims: Pain, disability, trunk range of motion (ROM) and trunk muscles endurance are usually assessed by clinicians in clinical setting. Execution of these examinations is tiring both for patients and clinicians and needs a lot of time. The aim of the study was to answer these questions: Is there any correlation between these measures in Non-Specific Low Back Pain (NSLBP) patients? Could a clinical finding be used to predict other? Is it needed to perform all clinical examinations?

Methods: A convenient sample of 44 NSLBP patients aged between 20-45 years was recruited. Variables included pain, disability, trunk flexion and extension ROM, trunk flexor, extensor and side flexors endurance which were measured by VAS, Oswestry index, modified Schober method, Ito method and side support respectively. The Pearson correlation coefficient was used in statistical analysis.

Results: Results showed significant correlation between pain-right side flexor endurance ($P < 0.05$, Pearson = -0.31) and disability-flexor endurance ($P < 0.05$, Pearson = -0.35). The data demonstrated significance correlations among trunk muscle endurance as follow: Extensor endurance-right side flexor endurance ($P < 0.01$, Pearson = 0.43), Extensor endurance-left side flexor endurance ($P < 0.05$, Pearson = 0.33), Flexor endurance-right side flexor endurance ($P < 0.01$, Pearson = 0.46), Flexor endurance-left side flexor endurance ($P < 0.01$, Pearson = 0.47), Right side flexor endurance-left side flexor endurance ($P < 0.01$, Pearson = 0.88).

Conclusions: The negative significant correlation between pain and muscle endurance of trunk right side flexor might be representative of this fact that many patients had right side LBP. We did not find any correlation between pain and disability which might mean these two variables are complex and have multi-dimensional aspects. Some clinical examinations such as muscle endurance can be explained according to the result acquired from others. However, clinicians must be cautious in using results of some clinical examinations in replace to another such as pain and disability. These findings must be expressed according to patient conditions.

ARE CHANGES IN CENTRAL PAIN PROCESSING INVOLVED IN CHRONIC LOW BACK PAIN

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Just as musculoskeletal pain conditions like fibromyalgia, whiplash disorders and osteoarthritis might result from abnormal central pain processing, central sensitization (CS) might be involved in the chronicity of low back pain. The purpose of this case-control study is to determine if patients with CLBP show more signs of CS compared to RLBP and healthy controls (HC).

For the moment, 38 subjects participated: 17 CLBP, 14 RLBP and 7 HC. Samples will be increased until 20 subjects in each group. Quantitative sensory testing was used to measure pain detection thresholds (PDT), pain tolerance thresholds (PTT), spatial summation (SS), temporal summation (TS) and conditioned pain modulation (CPM) using a computerized cuff algometer.

Preliminary results showed significant differences between groups for local PDT's and PTT's: patients with CLBP showed significant lower PDT's and PTT's compared to HC, suggesting primary hyperalgesia. In RLBP, no lowered PDT's or PTT's were found. Also significant results were seen for SS in the CLBP group, but not in the RLBP and HC groups. Based on the present samples, the results for TS and CPM were not significantly different in these 3 groups.

These intermediate results indicate widespread hyperalgesia, allodynia and abnormal SS in CLBP, but differences in TS or CPM cannot yet be confirmed or ruled out, based on the present underpowered sample sizes. Final results are expected during summer 2015 and will further elucidate whether central pain processing is abnormal in CLBP (compared to HC or RLBP) and plays a role in chronification of low back pain.

EFIC5-0335

Clinical pain states: Neck and back pain

RESPONSE TO TREATMENT IN CHRONIC LOW BACK PAIN: CONSISTENCY, OUTCOME, AND CONSEQUENCES FOR QUALITY OF LIFE AND FUNCTION

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Background and aims: Chronic low back pain (CLBP) is difficult to treat. Few responder analyses have been reported, and the relationship between response for pain and other outcomes have not been explored. We set out to examine the consistency of pain reduction over time, the effects of using different outcomes, and how quality of life and function were related to response.

Methods: A post-hoc individual patient data analysis of a randomised double-blind, parallel-group trial (NCT00449176) comparing tapentadol extended release (ER) 100-250 mg bid, oxycodone controlled release (CR) 20-50 mg bid, and placebo over 15 weeks. Outcomes examined were pain intensity reduction (15 weeks compared with baseline), final pain state at 15 weeks, and Patient Global Impression of Change (PGIC). Patients withdrawing for any reason were regarded as treatment failure; no imputation was used.

Results: Of 981 randomised, 447 completed 15 weeks of treatment. Patients were consistent in their response, with low pain established early and continuing. Non-responders at 15 weeks were rarely responders at earlier times. Treatment effects were consistent between different outcomes and outcome levels (pain intensity reduction of $\geq 15\%$, $\geq 30\%$, $\geq 50\%$, or final pain of ≤ 3 , ≤ 4 , ≤ 5 out of 10 on a numerical rating scale). Tapentadol ER was significantly better than placebo (NNT about 12). Oxycodone CR was never significantly different from placebo. Responders had concomitant improvements in quality of life and function; non-responders did not.

Conclusions: Responder analyses are robust. Individual-patient level analysis in CLBP produces results consistent with similar analyses in other pain conditions.

PRESSURE PAIN DETECTION PARAMETERS AND CLINICAL CHARACTERISTICS IN LBP SUBJECTS WITH NEUROPATHIC COMPONENT

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Background and aims: Neuropathic component is poorly understood in low back pain (LBP). This study aims to explore the difference between subjects with and without neuropathic pain in early phase of chronic LBP.

Methods: 33 LBP (18 with neuropathic pain, detected by DN4 diagnostic questionnaire, and labeled as DN4+) and 34 healthy subjects were tested for pressure pain detection threshold (PPDT), pressure pain tolerance threshold (PPTT) at the site of maximal pain, at -10 cm distal to previous point, and the *ipsilateral* great toe using pressure algometer, pain intensity (VAS), Oswestry Disability score (ODS), Beck Depression Inventory score (BDI), lumbar ROM, manual muscle test (MMT) and sensory score for lower extremities, surface EMG amplitude and thickness change of *lumbar multifidus* (LM) and *transversus abdominalis* (TrA) during activation, measured by ultrasound.

Results: PPDT and PPTT were different between subjects with LBP and healthy group (group effect for PPDT $F(1,33)=13.07$ $p<0.000$, group effect for PPTT $F(1,33)=24.76$ $p<0.000$). PPDT and PPTT were not different between DN4+ and DN4- LBP subgroups (PPDT subgroup effect $F(1,9)=0.896$ $p=0.368$, PPTT subgroup effect $F(1,9)=1.405$ $p=0.266$). ODS $p<0.000$, VAS $p=0.04$, ROM extension $p=0.014$, MMT $p=0.02$, sensory score $p=0.001$ and relative thickness change for TrA (subgroup effect $F(1,18) = 5.08$, $p= 0.03$), were different between DN4+ and DN4- LBP subgroups.

Conclusions: PPDT and PPTT in hypersensitized LBP subjects do not discriminate between those with and without neuropathic pain. Most of clinical characteristics and thickness change of abdominal muscles during activation were different between the two LBP subgroups.

EFIC5-0391

Clinical pain states: Neck and back pain

ASSESSMENT OF SIT-TO-STAND MOVEMENT IN NON-SPECIFIC LOW BACK PAIN: A COMPARISON STUDY FOR PSYCHOMETRIC PROPERTIES OF FIELD AND LABORATORY-BASED METHODS

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Background and aims

The sit-to-stand (STS) movement is common and important daily life activity. One of the most difficult tasks associated with the management of non-specific low back pain (NSLBP) is its clinical assessment. There is a clear need for a simple and objectively measurable test to assess the STS movement in people with NSLBP. The aim was to compare the psychometric properties of field and laboratory-based tests for STS movement.

Methods

Thirty-eight people with NSLBP performed the 30-s chair stand test (30CST), and STS test with the Balance Master which measures weight transfer, rising index, and COG sway velocity. The participants performed the same tests after 48-72 hours. The intra-class correlation coefficient (ICC_{2,1}), standard error of measurement, smallest real difference were calculated to determine the test-retest reliability. The patients reported pain intensity and disability with a visual analogue scale and Oswestry Disability Index (ODI). The correlations between the tests, pain intensity and ODI were examined for construct validity.

Results

The 30CST had very high test-retest reliability (ICC=0.94). The variables of STS test had moderate test-retest reliability (ICC=0.62-0.69). There were significant correlations between 30CST, ODI and pain intensity at activity ($p<0.01$). The rising index was the only one variable of STS test which significantly correlated with pain intensity at activity ($p<0.05$).

Conclusions

The 30CST as a field test for the assessment of the STS movement had more reliability and validity than the laboratory-based counterpart. The 30CST is a simple and cheap method to assess the STS movement in people with NSLBP.

EFIC5-0401

Clinical pain states: Neck and back pain

THE COMPARISON OF NECK PAIN, BACK PAIN, AND LOWER-BACK PAIN SCORES OF NURSING STUDENTS BEFORE AND AFTER THE EXAM WEEK

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Background and Aims: Besides continuing clinical training, nursing students have intense educational programs. Therefore; this study aimed to compare the neck pain, back pain, and lower-back pain scores of nursing students before and after the exam week.

Methods: This comparative-descriptive study was conducted with 118 bachelor degree nursing students. The data were collected by a survey prepared by the researchers one week before the exam week and on last day of exam week. The severity of pain was measured with 0-10 Numeric Scale.

Results: Among the sample, 85.6% of the students were continuing their clinical training and the average days a week that spent in hospital were 1.80 ± 0.76 days. The average neck pain score was found 3.65 ± 1.75 before the exam week, and 4.79 ± 1.89 on the last day of the exam week. The average back pain score was found 4.29 ± 1.84 before the exam week, and 5.72 ± 1.89 on the last day of the exam week. The average lower-back pain score was found 4.70 ± 2.29 before the exam week, and 5.34 ± 2.34 on the last day of the exam week. The changes between the pain scores before and after the exam week were found statistically significant. The students who were exercising regularly reported significantly less lower-back pain after the exam week.

Conclusions: Nursing education includes both theoretical and clinical training, and the intensity of study workload is high. According to this study; neck pain, back pain and lower-back pain are common problems among nursing students, especially after intense studying periods such as exams.

EFIC5-0404

Clinical pain states: Neck and back pain

VERTEBRAL PAIN FEATURES IN WOMEN OF DIFFERENT AGE DEPENDING ON BODY MASS INDEX

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The aim is to study correlation and peculiarities of vertebral pain in women of different age depending on their anthropometric indicators.

Materials. 1886 women aged 25-89 years were examined. The patients were divided into groups according to age (25-44, 45-59, 60-74, 75-89 years-old) and body mass index (BMI: to 18.4 kg/m²(underweight), 18.5-24.9 kg/m²(normal), 25-30 kg/m²(overweight) and more than 30.1 kg/m² (obese).

Methods. The presence and intensity of pain was evaluated in the thoracic and lumbar spine using a visual analogue scale (VAS). BMI is calculated by the standard formula based on body weight and height measurements.

Results. The intensity of pain in the thoracic spine was significantly higher in the underweight women in the age groups of 25-44 years ($p=0.04$) and 60-74 years ($p=0.005$). The intensity of pain in the lumbar spine was significantly higher in the women of 45-59 years ($p=0.001$) and 60-74 years ($p=0.0003$) with obesity.

In the women of 45-74 years BMI was significantly positively correlated with the level of pain in the lumbar spine.

Obesity significantly increases the relative risk of pain in the lumbar region ($RR=1.07$ (95%CI:1.03-1.12; $p=0.002$)), while underweight significantly increases the risk of pain in the thoracic region ($RR=1.21$ (95%CI:1.00-1.46; $p=0.05$)).

Conclusion. In women, vertebral pain syndrome may be related to the anthropometric characteristics (e.g., BMI). Underweight may indirectly influence the development of pain in the thoracic spine and increase the risk of pain in this part by 1.21 times. Obesity influences the development of pain in the lumbar spine increasing the risk by 1.07 times.

EFIC5-0487

Clinical pain states: Neck and back pain

THE EFFECTS OF REPEATED ARM MOVEMENTS ON PRESSURE PAIN SENSITIVITY IN NECK PAIN PATIENTS AND HEALTHY CONTROLS

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Background and aims: Chronic neck pain (CNP) is commonly found in the general population and have been linked to increased pressure pain sensitivity. This study investigated the effects of repeated arm movements on the pressure pain sensitivity in CNP patients and asymptomatic controls.

Methods: 25 CNP (16 insidious onset [IONP], 9 whiplash associated disorder [WAD]) and 25 healthy controls participated. Pressure pain thresholds (PPTs) were measured over three bilateral locations in the neck, head, and arm. Measurements were done at baseline and after three series of arm movements (6 different trials) in the scapular plane. Each movement series were separated by 8 min. A final assessment was done immediately after another three movement series separated by 35sec. Perceived pain was recorded on an electronic visual analogue scale (VAS).

Results: No significant difference in VAS scores were found between CNP groups while both were higher than controls during all movement trials ($P < 0.001$). Both CNP groups displayed lower PPTs compared with controls for all measurements ($P < 0.03$). At baseline for the neck site the WAD showed reduced PPTs compared with IONP ($P < 0.05$). In controls increased PPTs was found post-movements for neck and head sites ($P < 0.04$) while reduced PPTs was found at all sites in IONP ($P < 0.03$).

Conclusions: Significant difference for both PPTs and VAS were found when comparing CNP with controls. Hypoalgesic effects were observed at two sites in controls while the opposite was the case for IONP. This may indicate the need for differentiated rehabilitation programs for different neck pain groups.

EFIC5-0572

Clinical pain states: Neck and back pain

PRESSURE PAIN THRESHOLD IN SUBCLINICAL NECK PAIN: A COMPARISON WITH ASYMPTOMATIC PARTICIPANTS

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Background and aims: Measurement of pressure pain thresholds (PPT) has been used for comparing pain perception between patients with neck pain and healthy controls and pressure algometry has been suggested as a diagnostic aid and as a means of evaluating the effect of different treatments on pain. To our knowledge, there are no studies comparing PPTs between participants with and without subclinical neck pain. The aim of this study was to compare PPT between participants with and without subclinical neck pain.

Methods: Participants with sub-clinical neck pain (n=25) and age- and sex-matched pain-free participants (n=25) had their PPT measured bilaterally in the C5-C6 zygapophyseal joint and upper trapezius. Sub-clinical neck pain was defined as idiopathic pain felt at least once a week in the last 3 months for which participants had never received any treatment.

Results: Mean ($\pm$ SD) pain intensity (measured using an 11-point VAS) for the neck pain group was 2.26 ± 1.86 and mean ($\pm$ SD) pain duration was 14.52 ± 14.64 months. Twenty one participants declared that their neck pain did not interfere with their daily activities. PPT measurements were significantly lower in the group of participants with sub clinical neck pain compared with the asymptomatic group (neck pain: mean ($\pm$ SD) PPT between 11.40 ± 6.98 and 13.77 ± 7.47 N/cm²; asymptomatic: mean ($\pm$ SD) PPT between 16.10 ± 9.02 and 18.73 ± 9.83 N/cm²; $p < 0.05$) for all the four sites measured.

Conclusions: Results suggest that peripheral sensitization is present at early stages of low intensity and low disability neck pain and that PPT could be valuable to assess these individuals.

EFIC5-0577

Clinical pain states: Neck and back pain

NECK FLEXORS AND EXTENSORS ENDURANCE IN ADOLESCENTS WITH IDIOPATHIC NECK PAIN: A COMPARISON WITH ASYMPTOMATIC PARTICIPANTS

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Background and aims: Neck pain (NP) is one of the most prevalent pain syndromes in adolescents and its prevalence has increased in the last decades. Studies in adults with NP have shown that it is associated with changes in the performance of neck muscles. However, studies in adolescents are scarce. The aim of this study was to compare deep neck muscles endurance and neck extensors endurance between adolescents with chronic idiopathic NP and pain-free adolescents and to assess the intra-rater reliability of the tests used.

Methods: Participants with (n=35) and without NP (n=35) aged 16 to 18 years old had their neck flexors and extensors endurance measured using the deep neck flexors endurance test and the neck extensors endurance test, respectively. Each test was repeated twice. Differences between groups were investigated using a Mann-Whitney test and reliability was assessed using an ICC.

Results: In the NP group, 51.4% reported a NP duration ≥ 1 year and 48.6% reported that their NP interfered with daily activities. Mean($\pm$ SD) NP intensity measured using an 11-point VAS was 3.7 ± 2.2 . ICCs in the pain group were 0.83 for the flexors test and 0.66 for the extensors test, suggesting at least moderate reliability. The NP group showed significantly less endurance for both the deep neck flexors (NP mean $\pm$ SD= 19.0 ± 13.5 s; pain-free mean $\pm$ SD= 31.5 ± 28.0 ; $p=0.02$) and extensors muscles (NP mean $\pm$ SD= 127.5 ± 115.0 s; pain-free mean $\pm$ SD= 166.0 ± 127.5 ; $p=0.02$).

Conclusions: NP in adolescents seems to be associated with disability and changes in muscles endurance capacity, highlighting the need for NP interventions targeting this age group.

EFIC5-0599

Clinical pain states: Neck and back pain

DIAGNOSTIC VALUE OF PHYSICAL EXAMINATION IN PATIENTS WITH CHRONIC LUMBAR RADICULOPATHY

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BACKGROUND AND AIMS:

Clinical examination of patients with chronic lumbar radiculopathy aims to clarify the nerve root impingement. The aims of this study was to evaluate the accuracy of clinical tests for diagnosis of lumbar radiculopathy.

METHODS:

55 patients suspected chronic lumbar radiculopathy were included. The tests were the straight leg raising test (SLR), the crossed SLR, and tests for motor muscle strength, dermatome sensory loss, and reflex impairment. Magnetic resonance imaging was the imaging reference standard. Images were evaluated to classify nerve root impingement as present or absent. Sensitivities and specificities for detection of nerve root impingement were calculated for each test. An overall clinical evaluation, concluding on the level and side of the radiculopathy, was performed.

RESULTS:

The sensitivity and specificity of SLR test for L4 (33% and 66%, respectively), L5 (56% and 67% respectively), and S1 (60% and 66%, respectively) were variable. The sensitivity and specificity of crossed SLR test for L4 (33% and 87%, respectively), L5 (22% and 87% respectively), and S1 (0% and 84%, respectively) were variable. The diagnostic accuracy of these tests to predict nerve root impingement was low. There was no correlation with the overall clinical evaluation concluding on the level and side of the radiculopathy and imaging findings of nerve root compression.

CONCLUSIONS:

The accuracy of individual clinical index tests used to predict imaging findings of nerve root impingement for lumbar radiculopathy is low. The tests are not very helpful for establishing the cause of radiculopathy.

EFIC5-0657

Clinical pain states: Neck and back pain

NEUROIMAGING CHARACTERISATION OF NEUROPATHIC AND MECHANICAL LOW BACK PAIN USING ARTERIAL SPIN LABELLING

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Introduction

Differentiation between nociceptive and neuropathic components of chronic low back pain (CLBP) is challenging. We aim to demonstrate differences in CLBP associated with underlying pain phenotypes in order to improve diagnosis, and ultimately, management. This study presents the functional imaging (fMRI) data that was collected as part of a study that also included behavioural evaluation, clinical examination and structural brain imaging.

Aims

To demonstrate differences in fMRI profiles of patients with mechanical low back pain (MLBP) and neuropathic low back pain (NuLBP) using arterial spin labeling (ASL).

Methods

46 CLBP patients and 20 healthy controls were recruited. The painDETECT questionnaire (PDQ) was used to identify two distinct CLBP sub-groups; patients with predominantly nociceptive mechanical symptoms (MLBP) (n=24) and patients with a significant neuropathic component (NuLBP) (n = 22). Image pre-processing and analysis were carried out using Statistical Parametric Mapping software 8. Comparisons between the 3 groups (controls, MLBP, and NuLBP) were conducted using voxelwise univariate analysis of covariance (ANCOVA) with age, gender and global CBF included as covariates of no interest in the model. Contrasts were specified comparing CBF values between MLBP, NuLBP and control groups.

Results

Using ASL neuroimaging we identified statistically significant increases and decreases in rCBF not only in CLBP patients compared to controls but also in NuLBP compared to MLBP patients.

Conclusions

Our data clearly demonstrate that CLBP patients with nociceptive and neuropathic phenotypes show discrete functional neuroimaging profiles, consistent with behavioural and examination profiles reported previously in the same group of patients.

EFIC5-0665

Clinical pain states: Neck and back pain

EXERCISE FREQUENCY IN RELATION TO PAIN AND DISABILITY: A U-SHAPED FUNCTION IN PATIENTS WITH LOW BACK PAIN

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Background/Aims

There is preliminary evidence showing a u-shaped function for the relation between physical activity and health problems, i.e. chronic pain in population-based samples. Too less or too much sports activity seem to be associated with more pain. Exercise treatment is an important module of multimodal treatments in chronic back pain. However, little is known about the relation between exercise frequency and pain disability in chronic back pain patients.

Methods

256 patients with chronic back pain attending exercise treatment were recruited from outpatient practices in Northrhine-Westfalia, Germany. Average pain intensity during 7 days was assessed using a numeric self-rating scale (NRS), disability by the Von Korff Disability Score (DS). Exercise frequency (hours/week) were assessed using a standardized exercise questionnaire. Four groups were built for exercise frequency according to the quartiles. A two-way ANCOVA with exercise frequency group and sex as between-subjects factors and age and training frequency history as covariates was computed, using SPSS-22.

Results

Concerning pain intensity, the ANCOVA revealed a significant main effect for exercise frequency group ($p < .05$). Post hoc tests showed significant higher pain scores in the lowest (< 3 h/week) and in the highest exercise frequency group (> 10 h/week) indicating a u-shaped function. In contrast, disability was higher in the lowest exercise frequency group, compared to all other subgroups, indicating a linear relationship.

Conclusions

Examination exercise frequency in patients suffering from low back pain who attend exercise therapy seems necessary in order to detect patients with too low or too high number of exercise sessions a week.

EFIC5-0680

Clinical pain states: Neck and back pain

SOMATOSENSORY SYMPTOMS IN PATIENTS WITH LOW BACK PAIN WITH AND WITHOUT RADICULOPATHY

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Background and aims: Low back pain (LBP) can consist of nociceptive or neuropathic components. Therefore it is important to phenotype patients according to the underlying pathomechanisms in order to choose the right treatment. Aim of the trial was to characterize and to compare clinical characteristics including somatosensory profiles, pain and physical function in patients with (BPr) and without (BP) radiculopathy.

Methods: Clinical examination and Quantitative sensory testing (QST) according to the standardized protocol of the DFNS was performed in 49 patients with LBP in the area of LBP and in case of radiculopathy additionally in the area of projecting pain on the leg. All patients answered questionnaires (PainDETECT(PDQ), FFbHR, Roland Morris).

Results: BPr (N=11) had higher pain intensity (NRS 5.68 vs 4.29; $p<0.03$) and higher PDQ Scores (14.18 vs 9.86; $p<0.05$) compared to BP (N=37). There were no significant differences in physical function between the two groups. BPr had a more pronounced loss of small fiber function (thermal sensory limen), increased mechanical hyperalgesia (blunt pressure, pinprick) and showed a trend towards a sensitization of thermal pain thresholds in the area of LBP compared to BP. Within BPr sensory profiles of the area of projecting pain and the area of LBP did not differ.

Conclusion: BPr are more sensitized including signs for central sensitization. Since QST profiles of the area of LBP and area of projecting pain do not differ, QST in the area of LBP can be used to identify neuropathic components and patients with radiculopathy.

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EFIC5-0681

Clinical pain states: Neck and back pain

THE ASSOCIATION BETWEEN NECK PAIN AND UPPER LIMB DISABILITY AMONG OFFICE WORKERS

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Background and aims

Several studies indicated that non-specific neck pain patients with severe neck pain and disability also reported severe upper limb disability. Neck pain is a common problem among office workers; however they do not always have a diagnosis of neck pain by a physician. The aim of this study was to investigate the association between neck pain and disability, and upper limb disability in office workers who do not have a definite neck pain diagnosis.

Methods

Sixty-one office workers were included in this study. The presence of neck pain during the 1 year was determined using the Nordic Musculoskeletal Questionnaire. Neck pain and disability was measured with the Neck Pain and Disability Scale (NPDS). Upper limb disability was measured with the Quick Disabilities of Arm, Shoulder, and Hand (Quick-DASH). Correlations between the NPDS and Quick-DASH were investigated with Pearson's correlation in participants who reported neck pain.

Results

Thirty-eight office workers (60.7%) reported that they had neck pain during the 1 year. The mean of NPDS was 28.41 ± 19.21 . The mean of Quick-DASH was 17.20 ± 19.32 . There was a significant correlation between the NPDS and Quick-DASH scores ($r=0.635$, $p<0.001$).

Conclusions

This study indicated that although there is no definite neck pain diagnosis by a physician, self-reported neck pain and disability are associated with upper limb disability. Consequently it seems possible that the assessment and management of neck pain would include the upper limbs.

LATENCIES OF PERIPHERAL AND CENTRAL COMPONENTS OF SOMATOSENSORY EVOKED POTENTIALS TO THE MEDIAN NERVE STIMULATION IN CHRONIC NON-SPECIFIC CHRONIC LOW BACK PAIN (CLBP)

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Background/Aim. People with CLBP have longer reflex response latencies (~ 15 ms delay) of trunk muscles during external upper limb perturbations [1]. We detected somatosensory abnormalities for painful and innocuous stimuli in CLBP (affected site, back and remote site, hand [2]) as a possible source of time delayed reflexes. Beside the detected changes at the level of somatosensory thresholds, a reduced conduction velocity of the somatosensory nerve might additionally lead to a time delayed reflex responses. The study aims to investigate latencies of peripheral and central components of somatosensory evoked potentials to the median nerve stimulation in CLBP patients and healthy controls.

Methods. Latencies to the median nerve stimulation at the ipsilateral Erb's point (EB; N9) and at a contralateral centroparietal electrode (CP3; N20) were compared between 11 CLBP patients (age: 39±15 years; height: 171±8 cm; CLBP: 11.9±13.9 years; current pain on NRS, 0-10): 2.4±2.1; 7 females) and 11 age-/gender-matched healthy controls (HCs: age: 38±16 years; height: 172±8 cm).

Results. Latencies of the N9 (CLBP, mean±SD: 10.31±0.41 ms; HC: 9.91±0.58 ms; $t = 1.88$, $P = 0.074$) and the N20 (CLBP: 19.35±0.81 ms; HC: 19.33±0.64 ms; $t = 0.058$, $P = 0.954$,) were comparable between CLBP patients and HC.

Conclusions. Our preliminary results indicate that the observed small changes of the peripheral N9 (~ 0.4 ms) can not explain the reflex time delay of ~ 15 ms.

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EFIC5-0750

Clinical pain states: Neck and back pain

EFFICACY OF MULTIPLE EPIDURAL INJECTIONS OF STEROIDS FOR LOW BACK PAIN

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Introduction

Low back pain is one of the most common reasons patients present to primary care practices . Epidural steroid injections are used with increasing frequency as a less invasive

Aim

to examine the efficacy of multi epidural injection in treatment of low back pain

Methods

We evaluated retrospectively 62 patients with low back pain .Depo-medrol (40 mg) mixed with 1 ml normal saline plus 1 ml of plain bupivacaine 0.5% and 1ml 2 % lidocaine, this total amount was administered in epidural space at the point of severe pain in prone position .The epidural injection was done 3 times for every patient, with an interval of 10 days in each injection .Each patient was interviewed and asked about the pain according to visual analogue scale on every visit .And after the third injection was given the patient was asked for a follow up after 8 weeks .

Results

After 10 days from first injection 35 patients (56.5%) showed improvement of pain, 25 patients reported no change and 2 patients had no follow up.

After the second injection 55 patients (88.7%) showed improvement, 4 patients showed no change and one patient had no follow up plus the two patients who received the first injection

After 8 weeks from last injection 57 (91.9%) patients completely improved of low back pain, one patient had pain and a total of 4 patients had no follow up .

Conclusion

Multiple epidural injections are effective and safe in the treatment of low back pain.

EFIC5-0836

Clinical pain states: Neck and back pain

ABOLISHED AFFECTIVE EVALUATION OF SENSORY INPUT IN CHRONIC LOW BACK PAIN PATIENTS

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Background and aims

There is growing interest in using neuroimaging methods to investigate the role of somatosensory processing in chronic low back pain (CLBP). The present functional MRI (fMRI) study aimed to reveal neuroplastic changes in CLBP patients by using a clinically relevant stimulus.

Methods

Force controlled, non-painful posterior-to-anterior (PA) pressure of 30N was applied on spinous processes of 14 controls and 14 CLBP patients. Fifty-one stimuli (duration 5s) were randomly applied at three lumbar levels (L1,L3,L5) with a randomized inter-stimulus interval (6 to 8s). Data analysis was performed using SPM8. Functional connectivity was computed with the “primary somatosensory cortex (S1)” as seed region, derived from group peak activations.

Results

In both groups, S1 similarly co-activated with distinct brain networks. However, the control group revealed significantly enhanced functional connectivity to the ventromedial prefrontal cortex (vmPFC) and the parahippocampal gyrus.

Conclusions

In order to evaluate perceived threat or negative affect, the vmPFC is associated with process of assigning meaning to sensory input, based on memories of prior experiences stored within parahippocampal areas. In healthy subjects, the present findings indicate that PA pressure on the lumbar spine generated an appraisal of the affective qualities of sensory inputs. In CLBP patients, this process was absent. These observations lead to the hypothesis that CLBP patients may have difficulties to affectively evaluate non-painful sensory inputs. As treatments based on functional and structural abnormalities of CLBP patients are frequently unsuccessful, these findings support the growing evidence that additional emotional mechanisms are involved in maladaptive somatosensory processing.

PAIN AND POSTURE IN ACCORDIONIST STUDENTS

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Background and aims: The accordion is an instrument with a considerable weight and size that requires an asymmetric body posture for its practice. In order to be proficient, students need to play for long hours. Therefore, it is necessary to understand whether its practice affects students. The aims of this study were to: (i) characterize pain presence and (ii) to compare forward head posture and lumbar lordosis between adolescents who play accordion and adolescents who do not play any musical instrument.

Methods: Pain was evaluated in 21 young accordionists, before and after 3 consecutive accordion lessons using the Nordic Musculoskeletal Questionnaire. Forward head posture was measured using a goniometer, shoulder symmetry was measured using a tape measure and lumbar lordosis was measured using a flexible ruler in 16 young accordionists aged 11 to 17 years old and in 16 non-instrumentalist participants matched for age and sex. Differences between groups were investigated using a Mann-Whitney test.

Results: There was an increase in pain prevalence after the accordion lessons at different body segments of up to 50%. Accordionists presented more forward head posture than non-instrumentalist (accordionist median $\pm$ IQR=35.6 $\pm$ 7.8 $^{\circ}$; non-instrumentalist median $\pm$ IQR=45.3 $\pm$ 10.8 $^{\circ}$; $p < 0.001$) and increased lumbar lordosis (accordionist median $\pm$ IQR=55.5 $\pm$ 30.6 $^{\circ}$, non-instrumentalist median $\pm$ IQR=39.9 $\pm$ 3.9 $^{\circ}$; $p = 0.002$). No significant differences were found for shoulder posture ($p > 0.05$).

Conclusion: The practice of accordion seems to be associated with pain, a more forward head and increased lumbar lordosis, highlighting the need to implement and evaluate strategies to minimize the impact of the practice of accordion on students' health.

EFIC5-0953

Clinical pain states: Neck and back pain

A COMPARISON OF POSTURAL CONTROL DEFICITS IN FEMALES AND MALES WITH CHRONIC NON-SPECIFIC LOW BACK PAIN

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Background and aims: Association of low back pain and postural control deficits are reported inconsistently. The aim of the current study was to investigate whether the postural control deficits differ between females and males with chronic non-specific low back pain (NSLBP).

Methods: The postural control deficits were measured in 51 patients with chronic NSLBP (25 females and 26 males) with the NeuroCom Balance Master System in this cross-sectional study. Limits of stability (LOS), unilateral stance (US) with eyes open and closed, and modified Clinical Test of Sensory Interaction on Balance (mCTSIB) were used to determine balance deficits. Disability level caused by CNSLBP was measured with Oswestry Disability Index (ODI).

Results: The groups were similar in according to that there was no significant difference between the ODI scores and pain intensity during activity and rest ($p>0.05$). There was no significant difference in the variables of the US and mCTSIB tests ($p>0.05$). Females had significantly worse LOS results, especially in the reaction time and movement velocity ($p<0.05$).

Conclusions: Females had postural control deficits in LOS. According to the results of this study, chronic NSLBP leads to the impairment of dynamic standing balance among females. Therefore, physiotherapy programs for female patients with chronic NSLBP should aim to restore the balance control in functional activities which for the prevention of the possible risk of falling may be caused by balance problems in activities of daily living.

EFIC5-1066

Clinical pain states: Neck and back pain

NEUROPSYCHOLOGICAL FEATURES OF PATIENTS WITH LOW BACK PAIN.

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This study investigated patients' personality profile with chronic back pain.

Methods: fifty patients, age from 29 to 79 years with diagnosis of lumbar dorsopathy, accompanied with low back pain were recruited. Control group included 17 individuals of the same age and gender, without low back pain. Psychological status was examined using Standardized Multifactorial method of Studying Personality (SMSP) – short version of MMPI questionnaire.

Results: At the baseline of our study the pain syndrome in patients of main group was equal to $6,7 \pm 1,8$ points assessed by the visual analogue scale. The average personality profile of main group patients by SMSP was beyond the standard corridor with five-phase peaked profile with peaks at: 1st scale of hypochondriasis 78.2 ± 3.5 ?, 2nd scale of depression 68.2 ± 2.7 , 3rd scale of hysteria 56.5 ± 2.5 ?, 7th scale of psychasthenia 58.6 ± 2.9 ?, 8th scale of schizophrenia 55.1 ± 2.2 ? and was characterized as a neurotic profile or a profile with a negative slope, indicating the excess premorbid emotional stress, anxiety, depression, increased concentration on health, fear. In control group average personality profile by SMSP significantly differed from that of main group and was located within the normative corridor from 30T to 70T, having a two-phase peaked profile at 7th psychoasthenia and 8th schizophrenia scales 50.0 ± 3.3 ? and 48.0 ± 4.7 ? respectively, suggesting the presence of anxious-hypochondriac character also revealed a positive self-appraisal and absence of neurotic disadaptation.

Conclusion: Chronic back pain in the patients with dorsopathy is formed on the background of premorbid neurotic personality and thus should be considered while choosing preventive and curative measures.

ANTINOCICEPTIVE EFFECTS OF KETOPROFEN ON HIPOESTROGENIC WISTAR RATS WITH HIGH SUCROSE DIET

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Perception and pain threshold may increase or decrease during obesity. NSAIDs are the most commonly used drugs in the treatment pain, for example, ketoprofen. However, there are no studies evaluating the analgesic response to ketoprofen in patients obese. The aim of this study was to analyze the time course of nociceptive pain in Wistar rats hypoestrogenic with high sucrose diet and compare the antinociceptive response using ketoprofen. The hypoestrogenism was induced by bilateral ovariectomy. Animals received hypercaloric diet (30% sucrose in drinking water) or water *ad libitum* for 17 weeks and it was measured the thermal nociception in this period. In the 4th and 17th week it was evaluated different dose of ketoprofen (1.8-100 mg/Kg p.o.) in high sucrose diet and control rats. The nociception was assessed using the "Plantar test" method. A biphasic response was observed: thermal latency was significantly decreased in the 4th week (hyperalgesia), and from 12 to 17 week was observed significantly increased in thermal latency (hypoalgesia) compared to their control group. The administration of ketoprofen in the 4th and 17th weeks showed dependent effect of dose in both groups, however, it was observed greater efficacy in 4th week with the animals which received sucrose. Nevertheless in the 17th week the efficacy there was no different in both groups. Our data shows that the nociception is altered in the animals that were fed with sucrose. Ketoprofen shown a dose dependent antinociceptive effect. However, obesity status did not influence analgesic response to different dose of ketoprofen

200MG AND 400MG OF IBUPROFEN PROVIDE SIGNIFICANTLY LONGER PAIN RELIEF THAN 500MG AND 1000MG OF PARACETAMOL IN DENTAL PAIN

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Background and Aims

Few clinical trials in acute postoperative pain allow accurate assessment of the duration of action of single doses of common OTC analgesics. This trial tracked the time to use rescue medication or second dose of study medication to measure analgesic duration.

Methods

In a double-blind, parallel-group, placebo-controlled, randomized, multi-centre dental pain trial, subjects with moderate to severe pain following third molar extraction (≥ 50 mm, pain intensity VAS) received single doses of ibuprofen or paracetamol¹. A new analysis compared differences between ibuprofen and paracetamol for measures of duration of action and subject satisfaction.

Results

	Ibuprofen (n)		Paracetamol (n)	
	200mg (73)	400mg (74)	500mg (74)	1000mg (71)
AUC 0-8 SPRID (Least Squares mean)	2.94 ^{A,B}	3.34 ^{A,B}	1.63	2.19
Kaplan Meier median time to rescue or remedication (h)	8.2 ^{A,B}	8.4 ^{A,B}	4.0	5.2
Subjects who used rescue at 6 h (%)	26.7	18.9	67.1	58.1
Subjects who used rescue at 8 h (%)	38.7	28.4	73.7	68.9
Global assessment of study medication (Least Squares mean)	3.19 ^A	3.58 ^{A,B}	2.58	2.92
Subjects rating study medication as Good, Very Good or Excellent (%)	74.0	83.8	48.6	65.8

SPRID Sum of the pain relief and pain intensity differences

^A statistically significantly different from paracetamol 500mg, $p < 0.01$

^B statistically significantly different from paracetamol 1000mg, $p < 0.01$

Conclusion

Ibuprofen was shown to have a longer duration of analgesia than paracetamol. Ibuprofen treated subjects also used less rescue medication and were more satisfied with their treatment.

(¹ Mehlisch et al, Clin Ther 2010).

TLAG AND TC_{MAX}REF AS PREDICTORS OF RAPID ANALGESIC ONSET: COMPARISON OF SOLUBLE IBUPROFEN WITH STANDARD IBUPROFEN FORMULATIONS.

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Background and aims

In acute pain, fast absorbed analgesics lead to rapid analgesia, better pain relief and less rescue medication^{1;2;3}. T_{max} is often used to assess onset of action of analgesics. This study used time when plasma concentration of drug starts to increase (T_{lag}) and time to reach C_{max} of ibuprofen acid (T_{CmaxRef}) to assess and compare the early absorption of soluble ibuprofen formulations with standard ibuprofen acid.

Methods

In an open label, randomized, crossover, two phase (pilot/pivotal), single centre pharmacokinetic trial 43 healthy volunteers received single doses of ibuprofen acid (reference), ibuprofen lysine, ibuprofen liquid capsules, or ibuprofen sodium. Blood samples were assayed from 1 minute using a sensitive bioanalytical method (LLQ=10 ng/ml).

	Ibuprofen acid	Ibuprofen lysine	Ibuprofen liquid capsule	Ibuprofen sodium
Cmax µg/ml, average (SD)	29.1 (7.60)	42.3 (10.50)	39.6 (9.37)	37.8 (10.78)
Tmax Median mins	150	36	40	37
TCmax Ref/Test GLSM (95% CI)		5.75 (4.53-7.29)	4.51 (3.62-5.64)	3.66 (2.71-4.95)
Tlag GM (95%CI) mins	10.1 (8.7-11.5)	3.1 (2.8-3.4)	4.8 (4.3-5.4)	6.1 (5.5-6.7)
% of subjects with Tlag ≤ 5 mins (95% CI)	12 (0-23)	100 (100-100)	64 (48-80)	32 (17-48)
SD – standard deviation	Ref- reference		CI – confidence interval	
GM – geometric mean	GLSM – geometric least squares mean			

Conclusion

Ibuprofen salts can be absorbed in less than 5 minutes and up to 5.75 times faster than ibuprofen acid. T_{lag} and T_{CmaxRef} may predict early start and speed of absorption and therefore, early analgesia. (1Geisslinger et al. Int.J.Clin.Pharm.Th. 1989. 2Sorgel et al. Int.J.Clin.Pharm.Th. 2005. 3Moore et al Pain. 2014)

FORMULATION MATTERS. SOLUBILISED IBUPROFEN AND THE EVIDENCE FOR IMPROVED GI TOLERABILITY.

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Background and Aims: Faster-absorbed soluble ibuprofen formulations provide faster analgesia and less need for remedication¹. However, their gastrointestinal safety and tolerability has been the subject of some discussion. This study compared in vitro dissolution rates, pharmacokinetic data and spontaneously reported gastrointestinal events of 4 preparations of OTC ibuprofen to investigate the effect of formulation on GI tolerability.

Methods: Comparative dissolution data on standard ibuprofen acid tablets and lysine, sodium and liquid capsule ibuprofen formulations was obtained together with spontaneously reported adverse events and pharmacokinetic data on the same preparations.

Results: In simulated gastric fluid, solubilised ibuprofen in tablet formulations behaved differently from standard ibuprofen acid with smaller crystals that remained in suspension while liquid capsules produced micelles that floated from the lysed capsule leaving only the gelatin shell in prolonged contact with the vessel wall.

Pharmacokinetic data from a number of bioavailability studies is summarised with pharmacovigilance data in the table below:

	Ibuprofen acid tablets	Ibuprofen lysine tablets	Ibuprofen sodium tablets	Ibuprofen liquid capsules
Tmax range mins	75-114	32-44	33-42	32-44
Cmax range µg/ml	33-39	43-50	43-53	43-50
GI AE incidence rate per packs sold	1 per 452,255	1 per 597,862	1 per 548,538	1 per 2,591,033

Conclusion: Soluble formulations of ibuprofen have faster absorption and higher peak plasma levels. They appear to be associated with a reduced reported incidence of GI adverse events. Improved dissolution characteristics of ibuprofen formulations may reduce direct contact with GI mucosa and be linked to GI tolerability. 1 Moore et al. Pain 2014

A STUDY TO INVESTIGATE THE PHARMACOKINETICS AND PHARMACODYNAMICS OF PARACETAMOL IN HEALTHY ADOLESCENT SUBJECTS.

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Pediatric studies investigating the effects of paracetamol on analgesia are limited, as they have mainly explored postoperative pain using pain scales. In addition, most studies investigating paracetamol analgesia in children have not included pharmacokinetic parameters as part of their analyses. The current double-blind, randomised study was performed to investigate the pharmacokinetics and pharmacodynamics of paracetamol in healthy adolescents.

The battery consisted of tests eliciting cutaneous electrical, mechanical, and thermal (contact heat and cold pressor) pain and included a paradigm of inhibitory conditioned pain modulation (iCPM). Subjects were administered a single oral dose of paracetamol 1000 mg or placebo. Pain test measurements were performed at baseline, hourly until 3 hours and 5 hours post-dose. Endpoints were analyzed using a mixed model analysis of variance. Saliva paracetamol concentrations were determined using an enzymatic assay. Subjects filled out an evaluation questionnaire at the end of the study.

12 (5 male and 7 female) adolescent subjects aged 16 or 17 years completed the study. For paracetamol, the observed C_{max} was 11.2 µg/L, t_{max} 1.96 h and the terminal half-life was 2.28 h. adverse events reported (nausea and headache) were all transient and mild in severity. No significant differences (p>0.05) between paracetamol and placebo treatments were observed for any of the pain tests. All (100%) subjects enjoyed participating in the study. 75% of the adolescents participating in the trial would participate again.

The current study demonstrates that pain research using a comprehensive battery of nociceptive tests is feasible and acceptable to healthy adolescent subjects.

STABILITY AND EFFICACY OF MIXTURES OF OPIOID AND NSAID FOR THE TREATMENT OF ACUTE PAIN IN MICE

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Background and aims. The use of opioids and NSAID is very common in the treatment of postoperative pain, but often their onset of effect or inadequate form of administration may result in poor pain control. In collaboration with groups of medical doctors and pharmacists, two intravenous mixture formulations have been optimized in order to obtain a safe and effective approach for later use in acute postoperative pain. *The studied physical and physicochemical characteristics (appearance, particle size and pH) met the acceptance criteria for intravenous administration.*

Our aim is to study the stability and efficacy of mixtures of morphine+metamizol and morphine+diclofenac in mice.

Methods. Male mice 25-30g were used. The antinociceptive effect of mixtures has been studied in the hot-plate test, intraperitoneally administering, immediately and 1, 2, 6, 12, 24, 48 and 72 h post-processing. The composition of each mixture was: 1) 50 mg morphine + 300 mg diclofenac and 2) 50 mg morphine + 12 g metamizol / 100ml.

Results. Both mixtures produced analgesia in mice, but the mixture of metamizol and morphine was more effective than mixture of morphine and diclofenac. The mixtures were stable over time, and maintained their analgesic effect within 72 hours after preparation.

Conclusions. Combinations of morphine+NSAID show antinociceptive long lasting effect. Currently, the mixture of morphine and metamizol is being optimized for later use in the treatment of acute postoperative pain.

EFIC5-0775

Clinical pain states: Pain in children

SOCIAL FUNCTIONING IN CHILDREN AND ADOLESCENTS WITH CHRONIC OR RECURRENT PAIN: A SYSTEMATIC REVIEW FOCUSED ON EXPLICATIVE THEORIES AND MECHANISMS

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Background and aims:

Social functioning is frequently affected in children and adolescents with recurrent and chronic pain. Previous literature shows that their social activities are restricted, they report having fewer friends, and they are viewed as more isolated. Furthermore, they might be subjected to peer victimization and perceived as less likeable.

The aim of this review is to analyze the available literature in this field, focusing on which mechanisms might explain the relations between pain and social functioning.

Methods:

We are conducting a systematic review. For this purpose, we have searched PubMed and PsycINFO using the following terms: Pain, Social Behavior, Interpersonal Relations, Peer Group, Friends, Social Support, Social Perception, Social Participation and Social Functioning. Inclusion criteria are: 1) studies designed to investigate factors that are related to or have an impact on social functioning in children and adolescents (between 6 and 18 years old) with chronic or recurrent pain; and 2) primary studies published in Spanish or English until January 2015 in peer-reviewed journals. Additionally, the reference lists of selected articles and related reviews have been reviewed.

Results:

391 citations were identified in Medline and 34 in PsycInfo. A total of 83 empirical articles met the inclusion criteria, and their full texts are currently being revised by two independent reviewers. The final results will be presented on the poster.

Conclusions:

A comprehensive summary of the literature on the mechanisms that explain social functioning in this population will be presented, along with implications for clinical practice and future research.

EFIC5-0847

Clinical pain states: Pain in children

PLANNED MOUTH CARE TRAINING FOR THE PEDIATRIC ONCOLOGY PATIENTS AND INSPECTION OF THIS TRAINING'S INFLUENCE ON THE DEGREE AND PAIN OF THEIR ORAL MUCOSITIS DISEASE

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An effectively and regularly applied mouth care is one of the most important factors to be protected against oral mucositis. This research study is a semi-experimental and cross sectional study and it has been completed, in order to inspect the planned mouth care training given to the pediatric oncology patients and to inspect its influence on the degree and pain of their oral mucositis diseases.

The sampling group has been created from the 16 chemotherapy patients aged between 08-18 years old who are being treated in the Pediatric Oncology Clinics at Trakya University. Data has been collected, using the 'Mucositis Evaluation Index" of the World Health Organization and the 'Children's International Mucositis Evaluation Scale. Data has been evaluated, using percentile average and standard deviation, chi square, Friedman variance analysis and Spearman correlation analysis.

Average age of the children participated in this study is 13.1 ± 2.9 and 11 of the participated children were male and 5 of them were female. It has been found out that the difference between the mucositis degrees of the children, who have been taking chemotherapy, before and after the training is very important and meaningful from statistical aspect ($p < 0.05$). The difference between the pain points of children before and after the training has been found meaningful from statistical aspect ($p < 0.05$).

Our research has shown that the mucositis degree of the children, who have been regularly applying mouth care and taking the planned mouth care trainings, are being reduced and consequently, their pain levels are also being decreased.

EFIC5-0882

Clinical pain states: Pain in children

EFFECTIVITY OF THE 8% CAPSAICIN PATCH IN PEDIATRIC PATIENT WITH TYPE I REGIONAL COMPLEX SYNDROME.

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Background and aims: We present a 10-year-old girl diagnosed with surgical complex regional pain syndrome (CRPS) who was treated with 8% capsaicin patches

Methods: A cavernous hemangioma in the 2nd right finger toe was removed at the age of 7.

Residual worsening pain was left, so 2 years later, referral to the Pain Unit presenting with neuropathic pain (DN4 6) continuous rest pain (VAS 6/10), as well as hyperalgesia (VAS 6/10) and allodynia (7/10); several analgesics and local lidocaine patches were given without response. Due to the previous treatment failure and after obtaining all the consents, she was started on the capsaicin patches (applied by specialized staff and using topical anesthetic cream first)

Results: She was followed up on the outpatients clinic after 1 month and 3 months of treatment, presenting with a notorious improvement: continuous pain (VAS 5 (1 month) and VAS 3 (3 months)); allodynia (VAS 5 (1 month) VAS 2 (3 months)). Pain during exercise also improved and was well tolerated by the patient, regardless of a rash and itching that she presented in the 24 hours after the patch application. High degree of patient and parents satisfaction was achieved.

Conclusions: The capsaicin patch can be an alternative for the management of the pediatric local neuropathic pain. More studies on the capsaicin patches use in children are needed.

EFIC5-0054

Clinical pain states: Fibromyalgia

CORRELATION OF MAGNESIUM LEVELS AND IGF-1 LEVELS IN FIBROMYALGIA PATIENTS

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Low levels of RBC Magnesium and IGF-1 have been described separately in Fibromyalgia (FM) patients in addition to other comorbidities. The relationships of these problems to one another have not yet been determined. This study was designed to show if there was a correlation between the two abovementioned abnormalities in FM patients. There were 60 FM patients (10 men, 50 women), mean age 49.5 yrs for men, 42.8 yrs for women. All fulfilled 1990 ACR criteria for FM. Mean RBC Magnesium level for the FM patients was 4.49 mg/dl which was statistically significantly lower than the mean for the control group of Osteoarthritis patients and the laboratory standard mean of 5.5 mg/dl. The mean IGF-1 level for the FM patients was 159.33 ng/dl which was much lower than the expected mean of 235 ng/dl which was calculated based on the patients' ages, since IGF-1 levels are age-dependent. Comparing both determinations for each patient, a correlation coefficient of 0.48 was calculated with a test statistic of 1.97. There was a statistically significant positive correlation between the IGF-1 levels and the RBC Magnesium levels in the 60 FM patients studied. This has implications for treatment and further diagnostic testing.

EFIC5-0102

Clinical pain states: Fibromyalgia

EXERCISE CAPACITY AND AUTONOMIC FUNCTION IN PATIENTS WITH MODERATE FIBROMYALGIA

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Background and Aims: Studies of exercise capacity and autonomic function in fibromyalgia suggest possible deficiencies, but research has not evaluated both variables using clinically validated tests in patients and controls. Our objective was to characterize exercise capacity and autonomic function using clinically validated measures and subjective questionnaires between patients with fibromyalgia and healthy controls.

Methods: Thirty patients and 30 controls completed physiological tests, including the 6 Minute Walk Test, cardiopulmonary exercise testing, and Autonomic Reflex Screen, and self-report questionnaires, including the International Physical Activity Questionnaire and 31-item Composite Autonomic Symptom Score. Physiological tests and self-report questionnaires were compared between patients and controls.

Results: Autonomic function, as assessed by self-report, was significantly different between patients and controls ($p < .0001$); in contrast, the only difference between patients and controls on the Autonomic Reflex Screen was in the adrenergic domain ($p = .022$), and these abnormalities were mild. Self-reported physical activity was not significantly different between patients and controls ($p = .99$), but levels of moderate and vigorous physical activity as measured by actigraphy, were significantly lower in patients ($p = .012$ and $p = .047$, respectively). Exercise capacity (6 Minute Walk) was poorer in patients ($p = .0006$), but there was no significant difference in maximal volume of oxygen consumption ($p = .07$).

Conclusions: Patients with fibromyalgia report more severe symptoms across all domains including physical activity and autonomic symptoms when compared to controls, but the objective assessments only showed modest differences. Our results suggest that clinically significant levels of autonomic dysfunction may not be present in patients with fibromyalgia with moderate symptom severity.

EFIC5-0007

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

ELECTROACUPUNCTURE EFFICACY IN OPIOID TOLERANCE RAT MODEL

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Background and aims: Opioid is widely used in cancer pain, but long-term use may lead to tolerance. This research is to explore the efficacy of electroacupuncture treatment in morphine tolerance rat model with cancer induced bone pain (CIBP). And to study the expression of calcitonin-gene related peptide (CGRP) immuno-histochemistry in dorsal root ganglion (DRG).

Methods: Forty SD rats were divided into four groups: sham, CIBP+morphine tolerance (CM), CIBP+electroacupuncture (CE), and CIBP+morphine tolerance+electroacupuncture (CME). CM, CE and CME groups were prepared CIBP model by carcinoma cell tibia implanted. Sham only accepted sham operation without carcinoma cell implanted. After six days, the three CIBP models accepted treatment of morphine, electroacupuncture, and morphine combined electroacupuncture, separately, nine days continuously. Acupoints were selected Zusanli (ST36) and Sanyinjiao (SP6) bilateral. Electroacupuncture treatment was manipulated by 2/50 Hz frequency, 20min bid, 9 days continuously. 50% mechanical withdraw threshold was evaluated by von Frey filament stimulation. CGRP expression in DRG was detected by immunohistochemistry.

Results: After 9 days of electroacupuncture treatment, pain threshold was (10.9±0.8)g in CME group, (8.7±0.6)g in CM group and (6.2±0.9)g in CE group. The results had significant statistical differences ($P<0.01$, separately). IOD value of CGRP expression in dorsal root ganglion was 9026.5±1827.4 in CME group, compared with 14803.1±2086.7 in CM group and 15730.6±2712.5 in CE group ($P<0.01$, separately).

Conclusions: Electroacupuncture can relieve opioid tolerance in CIBP rat. The mechanism is related to CGRP overexpression inhibited in DRG.

EFIC5-0339

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

EFFECT OF TAPENTADOL TREATMENT ON T LYMPHOCYTE CYTOKINES IN NORMAL AND NEUROPATHIC MICE: COMPARISON WITH MORPHINE AND REBOXETINE

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Background and aims

Opioid drugs affect immunity, but not all opioids share the same immunomodulatory properties. Tapentadol is an analgesic with a dual synergistic mechanism of action: MOR agonism and noradrenaline reuptake inhibition (NRI). Weaker MOR agonism combined with NRI results in potent analgesia with reduced opioid-induced side effects. We evaluated the impact of acute and chronic tapentadol on acquired immunity in normal mice and in mice with painful neuropathy, comparing it with morphine and reboxetine, a pure NRI.

Methods

Tapentadol, reboxetine and morphine were subcutaneously injected into normal and neuropathic mice (chronic constriction injury). Their effect on splenocyte Thelper(Th)1 and 2 cytokines was measured after acute or chronic treatment. In parallel, nociceptive thresholds and Thermal hyperalgesia were evaluated.

Results

Two hours after acute injection, tapentadol did not alter the production of Th cytokines while morphine suppressed both Th1 and Th2 cytokines. When chronically injected, tapentadol, similarly to reboxetine, did not affect Th2 cytokines but it reduced both IL-2 and IFN-gamma after 14 day treatment; a suppression of all cytokines is present after chronic morphine. In neuropathic mice the effect of tapentadol is different from that of morphine: Th cytokines decreased in CCI mice but, after 7 day treatment in the presence of a similar anti-hyperalgesic effect, tapentadol and reboxetine restored Th2 cytokines while morphine did not.

Conclusions

Acute tapentadol is devoid of any immunomodulatory effect; after chronic treatment it results particularly protective of Th2 cytokines, in contrast to morphine that exerts a generalized suppression on all Thelper cytokines.

A THREE DRUG COMBINATION CAN RESTORE INFLAMMATION-REACTIVE ASTROCYTE NETWORKS

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Background and aims: Several cell parameters are affected in inflammation-reactive astrocytes such as Ca^{2+} signalling, Na^+/K^+ -ATPase activity, receptor activities, actin filament organization, and release of pro-inflammatory cytokines. We aim to re-establish these parameters back to a normal homeostasis, with a three-drug combination.

Methods: Astrocytes in primary cultures were incubated with lipopolysaccharide (LPS) (10 ng/ml) for 24 h to become inflammation-reactive. Intracellular Ca^{2+} release and signalling (Fura-2/AM), Na^+/K^+ -ATPase expression, actin filament organization (AlexaTM488-phalloidin probe), and interleukin-1 β release (IL-1 β) were measured.

Results: The agents we used were an opioid agonist, endomorphin-1, which stimulates the $\text{G}_{i/o}$ protein of the μ -opioid receptor, an opioid antagonist, naloxone, which inhibits the G_s protein of the μ -opioid receptor in ultralow concentrations, and an anti-epileptic agent, levetiracetam, which counteracts the release of IL-1 β . The combination of these three agents managed to activate the $\text{G}_{i/o}$ protein and Na^+/K^+ -ATPase activity, inhibit the G_s protein, and decrease the release of IL-1 β . The disorganized actin filaments were restored.

Conclusions: We have found that network coupled astrocytes change in different parameters when they are stimulated with inflammatory substances. Using a three-drug combination, we managed to re-establish homeostatic cell parameters. These results can be of clinical significance and may be useful for treatment of neuroinflammation. Long-lasting pain may partly be a consequence of ongoing neuroinflammation, in which the astrocyte networks play a significant role. These findings put new potential drug regimens towards treatment of neuroinflammation and long-term pain into focus.

PREGABALIN ENHANCES THE ANTINOCICEPTIVE EFFECT OF OXYCODONE AND MORPHINE IN THE RAT WITHOUT ANY PHARMACOKINETIC INTERACTIONS

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Background and aims: Gabapentin potentiates the antinociceptive effects of morphine.

Although oxycodone is increasingly being used in combination with pregabalin, the interaction is scarcely studied. It is not known whether pregabalin affects concentrations of oxycodone or morphine in the central nervous system. We investigated the interaction of pregabalin with both oxycodone and morphine in acute models of thermal nociception in the rat. We also investigated whether pregabalin has any effect on the brain concentrations of either of the two opioids or *vice versa*.

Methods: Effects of pregabalin on acute oxycodone- or morphine-induced antinociception, tolerance, and sedation were studied using tail-flick, hot plate and rotarod tests in rats. Concentrations of pregabalin, opioids and their major metabolites in the brain were quantified by mass spectrometry.

Results: In hot plate test, morphine (2.5 mg/kg, s.c.) caused antinociception of 28% maximum possible effect (MPE), whereas pregabalin (50 mg/kg, i.p.) produced 8–10% MPE. Co-administration of pregabalin and morphine resulted in antinociception of 63% MPE. Oxycodone (0.6 mg/kg s.c.) produced antinociception of 18% MPE, which increased to 39% MPE after co-administration with pregabalin. When pregabalin 10 mg/kg was administered before oxycodone (0.6 mg/kg, s.c.) or morphine (2.5 mg/kg), only the effect of oxycodone was potentiated in the tail-flick and the hot plate tests. Brain concentrations of the opioids, their major metabolites, and pregabalin were unchanged.

Conclusions: Pregabalin potentiated antinociceptive and sedative effects of oxycodone and morphine in acute nociception. Co-administration of pregabalin did not affect the brain concentrations of oxycodone or morphine.

PHARMACODYNAMIC CHANGES OF MU OPIOID RECEPTORS CONTRIBUTE TO THE INCREASED SENSITIVITY TO MORPHINE IN RATS WITH CHRONIC RENAL FAILURE

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Background and aims: Patients with chronic kidney disease (CKD) show increased sensitivity to morphine. This has been attributed to accumulation of the active metabolite morphine-6-glucuronide. However, pharmacodynamic changes of morphine as a consequence of chronic renal failure (CRF) have not been studied. Our aim was to test if pharmacodynamics of morphine are altered in an experimental model of chronic renal failure.

Methods: Wistar rats weighting 250-300 g underwent 5/6 nephrectomy resulting in CRF. Sham procedures were used in control rats. 24 weeks after nephrectomy the antinociceptive effect of morphine was tested using the hot plate test. Densities of brain μ opioid receptors (μ OR) and NMDA receptors were measured by performing radioligand binding experiments using selective radioligands. Coupling of brain μ OR to G proteins was determined by measuring the binding of [³⁵S]GTP- γ -S induced by selective agonists. Plasma morphine concentration was measured by LC-MS.

Results: Rats with CRF were more sensitive to the antinociceptive effect of morphine than sham animals. Plasma morphine was unaltered in CRF as compared with sham rats. In the brain, Kd's and Bmax's of μ OR and NMDA receptors were similar in sham and CRF rats. The morphine-induced [³⁵S]GTP- γ -S binding was higher in the brain of CRF as compared to sham rats. This difference was abolished in the presence of the selective μ OR antagonist CTAP.

Conclusions: Pharmacodynamic changes of μ OR may contribute to the increased effect of morphine observed in CKD.

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PRO- AND ANTINOCICEPTIVE EFFECTS OF BUPRENORPHINE IN THE SPINAL DORSAL HORN COVER A DOSE RANGE OF FOUR ORDERS OF MAGNITUDE

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Background and aims: Due to its distinct pharmacological profile, the opioid buprenorphine is considered a safe option for pain and substitution therapy with lower incidence of adverse events compared to other opioids. Despite its wide clinical use, little is known about the synaptic effects of buprenorphine in nociceptive pathways.

Methods: In deeply anaesthetized adult rats C-fibre-evoked field potentials were recorded in laminae I/II of the spinal dorsal horn as a quantitative measure of synaptic strength. For the behavioural experiments mechanical pain thresholds were assessed using calibrated von Frey filaments. Thermal thresholds were measured using the Hargreaves test.

Results: At an analgesically active dose of 1500 $\mu\text{g}\cdot\text{kg}^{-1}$, buprenorphine reduced transmission at spinal C-fibre synapses. This depression required activation of spinal opioid receptors, putatively μ_1 -receptors, as indicated by its sensitivity to spinal naloxone as well as to the selective μ_1 -receptor antagonist naloxonazine. In contrast, a 15000-fold lower dose of buprenorphine (0.1 $\mu\text{g}\cdot\text{kg}^{-1}$), which caused thermal and mechanical hyperalgesia in behaving animals, increased strength at spinal C-fibre synapses. The ultra-low-dose buprenorphine-induced synaptic facilitation was mediated by extraspinal, naloxonazine-insensitive, but CTOP-sensitive μ -opioid receptors, and was prevented by surgical disruption of descending pathways or by topical application of a broad-spectrum monoamine receptor antagonist. Selective inhibition of spinal 5-hydroxytryptamine-2 receptors (5-HT₂Rs) abolished both, the induction of synaptic facilitation and the hyperalgesia elicited by ultra-low-dose buprenorphine.

Conclusions: Our study revealed that buprenorphine mediates its modulatory effects on transmission at spinal C-fibre synapses by dose-dependently acting on distinct receptor subtypes, located at different levels of the nociceptive system.

EFIC5-0631

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

THE EFFECT OF M-OPIOID RECEPTOR ACTIVATION ON GABAERGIC SYNAPSES IN THE SUPERFICIAL SPINAL DORSAL HORN

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Background and Aim: Abrupt opioid withdrawal may lead to opioid-induced hyperalgesia (OIH). We have shown previously that withdrawal from μ -opioid receptor (OR) agonists causes long term potentiation (LTP) at glutamatergic synapses of primary afferent C-fibres, a potential mechanism of OIH. Here we investigated the effects of opioid withdrawal on GABAergic synapses in the superficial spinal dorsal horn.

Methods: We injected Dil into the periaqueductal grey (PAG) of young Sprague Dawley rats to retrogradely label spino-PAG neurons. We performed whole-cell patch clamp recordings from lamina I neurons in parasagittal and transversal lumbar spinal cord slices. Evoked inhibitory post synaptic currents (eIPSC) were elicited in identified projection neurons and in unidentified lamina I neurons by electrical stimulation of nearby interneurons.

Results: Bath application of μ -OR agonist DAMGO caused inhibition of GABAergic eIPSCs in subpopulations of projection neurons and unidentified neurons. Withdrawal from DAMGO induced LTP at GABAergic synapses in subpopulations of both neuron types. Direct inhibition and withdrawal LTP were associated with changes in the paired pulse ratio, indicating presynaptic expressions. Bath application of the μ -OR antagonist CTOP, but not blocking postsynaptic G-proteins prevented both, direct inhibition and withdrawal-LTP by DAMGO.

Conclusions: Activation of μ -OR depresses both, glutamatergic- and GABAergic postsynaptic currents in spinal lamina I neurons. Likewise, opioid withdrawal LTP can be induced at glutamatergic and at GABAergic synapses. The parallel changes in excitatory and inhibitory systems may serve as a balancing mechanism to avoid excessive amplification of nociception.

EFIC5-0715

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

SENSITIVITY OF PUPILLOMETRY IN TRACKING PHARMACODYNAMIC EFFECTS OF A NOVEL OPIOID, TRV130, IN A FIRST-IN-MAN TRIAL IN HEALTHY MALE SUBJECTS

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Background and aims: TRV130 is a novel G protein-biased ligand at the μ -opioid receptor. In preclinical studies it was demonstrated to be a potent analgesic with reduced severity of potentially dose-limiting adverse effects. Pupillometry was included in this single ascending dose (SAD) trial to test whether TRV130 could successfully cross the blood-brain barrier in order to engage with the μ -opioid receptor, and to provide an indication of an active analgesic dose of TRV130 for use in subsequent patient trials.

Methods: 8 doses of TRV130 were investigated ranging from 0.15-7mg IV using a SAD design. Pupil diameter was recorded using a hand-held digital pupillometer at regular intervals from pre-infusion to three hours post-infusion.

Results: TRV130 elicited marked pupil constriction (miosis) which lasted for at least three hours post-infusion at doses of 2.2, 4, and 7mg. Peak miosis, which occurred at 10 minutes post-infusion, was dose-related with significant miosis at doses ≥ 2.2 mg.

Conclusions: This study successfully demonstrated that TRV130 was able to cross the blood-brain barrier and interact with the μ -opioid receptor in a dose-dependent manner. TRV130, at doses ranging from 1.2-4mg, elicited pupil constriction of 0.4-2.7mm, which in other studies has correlated with analgesic effect of therapeutic doses of IV morphine (2-8mg) and buccal fentanyl (100-400 μ g). Taken together with a positive side-effect profile in this study these data support further evaluation of TRV130 to determine whether G protein bias at the μ -opioid receptor offers advantages in pain management compared to classic unbiased opioid ligands.

EFIC5-0781

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

**ZINC REDUCES OPIOID DEPENDENCE WITH NO EFFECT ON PAIN PERCEPTION IN RATS
– POSSIBLE BENNEFICIAL ROLES OF ZINC SUPPLEMENTATION IN OPIOID-USERS**

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Background and aims. Our previous studies showed a reduction of morphine-dependence intensity in conditions of zinc administration, probably related to zinc action of reducing opioids affinity to μ -receptors. The present study aims to investigate zinc effect on the acute analgesic action of a high morphine dose in tolerant rats.

Methods. Dependence was induced in a 5 and a 10-day schedule by escalating morphine doses administration (from 5 mg/kg – day 1 to 40 mg/kg – day 5 and 90 mg/kg – day 10). The acute analgesic effect of a high morphine dose (10 and 15 mg/kg) was assessed on days 6 and 11, respectively, by measuring tail-flick latency times (30 minutes before and after exposure). Analgesia intensity was compared in morphine-only groups vs. groups receiving morphine plus zinc sulphate (orally, 2 and 4 mg/kg/day, 14 days, prior to dependence induction – zinc doses previously shown to reduce naloxone-precipitated withdrawal). Also, we compared the analgesic effect of morphine in basal vs. zinc-supplementation conditions in non-tolerant animals.

Results. Both doses of zinc determined no influence on morphine analgesia in dependent (both schedules) rats. Also, the analgesic effect of morphine dose is not changed in non-tolerant animals previously exposed to oral administration of zinc sulphate for 14 days.

Conclusions. Zinc supplementation decrease morphine-dependence intensity in rats, but has no influence on analgesia. Considering zinc low toxicity and the association zinc deficiency – malignant tumors, zinc supplementation might be beneficial in patient receiving opioids for cancer-related chronic pain. Further clinical animal studies are needed.

EFIC5-0795

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

BENEFICIAL EFFECTS OF E-52862 IN CARRAGEENAN-INDUCED MECHANICAL ALLODYNIA AND THERMAL HYPERALGESIA IN RATS. ROLE OF THE PERIPHERAL OPIOID SYSTEM

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Background and aims: Systemic and peripheral administration of the selective sigma1 receptor antagonist E-52862 inhibited the pain-related behaviours in models of acute inflammation in mice (Gris *et al.*, 2014). On the other hand, E-52862 failed to modify the nociceptive thresholds after application of mechanical or thermal stimuli, but enhanced opioid antinociception (Vidal-Torres *et al.*, 2013). Our aim was to evaluate the effects of E-52862, alone or in combination with opioids, in the model of carrageenan-induced thermal hyperalgesia (TH) and mechanical allodynia (MA) in rats.

Methods: Analgesic efficacies of drugs (ip) were evaluated 4 hours after intraplantar injection of λ -carrageenan (2%) to male rats. TH and MA were quantified by measuring hind paw withdrawal latency in response to thermal (plantar test) or mechanical stimulation (von Frey).

Results: Morphine fully reversed both carrageenan-induced TH and MA (ED_{50} =2.7 and 5.2 mg/kg, respectively). E-52862 exhibited full efficacy in TH (ED_{50} =62 mg/kg) and partial efficacy in MA (E_{max} =39%). A sub-active dose of morphine did not modify E-52862 efficacy and potency in TH but significantly increased E-52862 efficacy in MA (E_{max} =100%, ED_{50} =74 mg/kg). This synergistic interaction also occurred combining E-52862 with the peripheral opioid agonist loperamide, which was devoid of activity by itself. The peripheral opioid antagonist naloxone methiodide significantly reduced E-52862-induced antihyperalgesic effects.

Conclusions: Part of the effects of E-52862 alone in the inhibition of carrageenan-induced TH and the synergistic effect of E-52862 with low-dose opioid inhibiting carrageenan-induced MA are due to the blockade of a tonically active anti-opioid sigma system at the peripheral level.

IMPAIRED OPIOID INHIBITION OF TRPV1 ACTIVITY IN RATS WITH DIABETIC NEUROPATHY

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Introduction: Painful diabetic neuropathy is a disease of the peripheral sensory neuron with impaired opioid responsiveness. Since μ -opioid receptor (MOR) activation can inhibit the transient receptor potential vanilloid 1 (TRPV1) activity in peripherally sensory neurons. **Aims:** This study investigated the mechanisms of impaired opioid inhibitory effects on capsaicin-induced TRPV1 activity in painful diabetic neuropathy. **Methods:** Using whole cell patch clamp, double immunofluorescence, radioligand binding, Western blot, and behavioural experiments, we set out to systematically investigate whether MOR-mediated inhibitory effects on capsaicin-induced TRPV1 activity are impaired in peripheral sensory neurons of rats with advanced streptozotocin (STZ)-induced diabetes. Additionally, we examined a possible treatment strategy to reverse this impairment. **Results:** Intravenous injection of STZ in Wistar rats led to a degeneration of insulin producing pancreatic β -cells, elevated blood glucose, and mechanical hypersensitivity. In these animals, local morphine's inhibitory effects on capsaicin-induced nocifensive behaviour as well as on capsaicin-induced TRPV1 current in dorsal root ganglion cells were significantly impaired. These changes were associated with a loss in MOR but not TRPV1 in peripheral sensory neurons. Intrathecal delivery of nerve growth factor in diabetic animals normalized sensory neuron MOR and rescued morphine's inhibitory effects on capsaicin-induced TRPV1 activity. **Conclusions:** These findings identify a loss in functional MOR on sensory neurons as a contributing factor for the impaired opioid inhibitory effects on capsaicin-induced TRPV1 activity during advanced STZ-induced diabetes. Moreover, they support growing evidence of a distinct regulation of opioid responsiveness during various painful diseases (e.g. arthritis, cancer, neuropathy) and may give novel therapeutic incentives.

EFIC5-0942

Basic Science (Anatomy/physiology/pharmacology/behaviour): Opioids

NEW INSIGHTS INTO THE MECHANISMS AND THERAPEUTIC IMPLICATIONS OF IMPAIRED SENSORY NEURON OPIOID RECEPTORS EFFICACY DURING EARLY PHASE OF PAINFUL DIABETIC NEUROPATHY

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Introduction: In early painful diabetic neuropathy opioid responsiveness is impaired without significant alterations in sensory neuron mu-opioid receptors (MOR). **Aims:** Identification of putative intracellular signalling mechanisms responsible for the loss in MOR function. **Methods:** Using radioligand binding, confocal double immunofluorescence, Western blot, and behavioural experiments, we investigated this in the early phase of streptozotocin-induced diabetes in rats. **Results:** In STZ-treated diabetic animals impaired peripheral opioid analgesia was associated with a reduction in functional MOR G-protein coupling without significant changes in MOR density. MOR immunoreactive neurons increasingly colocalized with protein kinase C (PKC) alpha (α) isoform, activated forms of PKC as well as the RAGE receptor diabetic rats. Moreover, MOR phosphorylation at Thr370 in peripheral sensory neurons of diabetic rats was due to RAGE-dependent PKC activation. Importantly, blocking PKC activation by PKC selective inhibitor, by silencing the RAGE receptor via intrathecal siRNA or preventing AGE formation by an AGE inhibitor prevented sensory neuron MOR phosphorylation and consequently restored G protein coupling and antinociceptive efficacy. Thus, we unveil a tight association between MOR phosphorylation, RAGE-dependent PKC activation and peripheral sensory neuron reduced opioid efficacy in diabetic rats. **Conclusions:** These findings demonstrate the therapeutic potential of impaired opioid responsiveness in the early phase of diabetic neuropathic pain. Supported by DFG grant SCHA 820/3-2

COMPARISON OF PONV PROPHYLAXIS WITH PALONOSTRON OR DEXAMETHASONE AND PALONOSTRON-DEXAMETHASONE COMBINATION

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Introduction

Next to pain post-operative nausea & vomiting (PONV) is the single most distressing symptom after surgery. PONV is a very unpleasant symptom which affects smooth emergence from anaesthesia and greatly reduces patient satisfaction in the post-operative period. Laparoscopic cholecystectomy has a high incidence of PONV.

Objectives

The presented study compares the efficacy of palonosetron-dexamethasone combination with each drug alone for prophylaxis of PONV after laparoscopic cholecystectomy performed under general anaesthesia (GA).

Methods

After institutional ethical clearance and written informed consent from patient 180 ASA Grade I & II patients aged 18-75 yr of either sex were enrolled in this prospective, randomized, double-blind trial to receive one of the three treatments: palonosetron 75 mcg (Group P; dexamethasone 8 mg (Group D); or palonosetron 75 mcg + dexamethasone 8mg (Group PD). Standardized balanced anaesthesia technique was used in all patients. Perioperative pain management was as per the institutional protocol. Primary outcome was incidence of PONV in the three study groups whereas postoperative shivering, sedation and pain were the other outcome.

Results

Incidence of PONV after laparoscopic cholecystectomy in the 1st 24 hr post surgery was 23.4%, 27.2% & 56.14% in groups PD, P and D respectively. Incidence of PONV in groups PD and P were lower than in group D (Statistical significance $P < 0.05$). However, difference in PONV incidence between groups PD and P were not statistically significant ($P > 0.05$).

Conclusion

Palonosetron and palonosetron-dexamethasone combination were better than dexamethasone alone for preventing PONV in patients of laparoscopic cholecystectomy.

AN INTRACEREBROVENTRICULAR MICROINJECTION OF BUPROPION DECREASE THE NALOXONE-INDUCED BURST FIRING OF THE VENTRAL TEGMENTAL AREA DOPAMINERGIC NEURONS (VTA-DA) IN MORPHINE DEPENDENT RATS

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Background and aims: VTA-DA neurons have critical roles in morphine dependence and withdrawal. Bupropion as an atypical antidepressant can facilitate morphine detoxification, with an unknown mechanisms. The acute effects of intracerebroventricular (ICV) microinjection of bupropion on naloxone-induced burst discharge of VTA-DA neurons was studied.

Methods: Wistar rats were prepared for VTA-DA neurons recording by urethane anesthesia. Individualized neurons with simple spiking activity were recorded in control, morphine dependent, vehicle, and 4 bupropion microinfused (0.01, 0.1, 1, and 10 microgram, ICV). The glass microelectrodes were inserted into the right VTA stereotaxically. The multiunit extracellular spikes with significant and stable spontaneous and burst firing were separated by Igor pro 6.0 software. Naloxone (3 mg, s.c.) was injected for morphine withdraw and bupropion were applied after bursting. The burst firing were analyzed by One-Way ANOVA with LSD post hoc test.

Results: 65 VTA-DA neurons with bursting discharge isolated. There was no any bursting neuron in control, but was one in the vehicle group. In dependent rats 64 neurons with naloxone-induced burst firing were inhibited by bupropion. The duration of burst discharge inhibition was dose dependent. The maximum burst inhibition was 64 min with minimum 5 min in average.

Conclusions: The dependence to morphine is related to changing of VTA-DA neuronal firing pattern. The inhibition of bursting firing in the dependent VTA can facilitate detoxification by bupropion. Bupropion and related compounds can use as a molecular adjuvant for morphine withdraw by naloxone.

EFIC5-0206

Clinical pain states: Pain in the elderly

PAIN PREVALENCE AND CHARACTERISTICS IN AN ELDERLY POPULATION IN OUTPATIENT SETTING IN ITALY

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Background: Pain is a common experience in elderly patients and is associated with an increased risk of disability and depression in this population. Aim of the present observational study was to evaluate the prevalence and the characteristics of pain in a population of elderly people assisted in an outpatient geriatric service in Italy.

Methods: Data were collected from October 2014 to January 2015 in patients over 70 years. We used the Pain Detect Scale a previous validated instrument. Presence of pain was assessed with visual-analogue scale (VAS), detecting presence and intensity of pain during the geriatric clinical evaluation and presence and intensity of pain during the last month. We collected also data on number of sites affected by pain.

Results: Mean age of 80 participants was 81 years, 54 (67,5%) were women and 26 (32,5%) were men. Prevalence of pain during outpatient evaluation was of 58,7% (47), 91,5% (43) of those patients reported an intensity of pain of 5 points or more at the VAS. Prevalence of pain in the last month was 78,7% (61), and 89,7% (58) of those patients reported an intensity of pain of 5 points or more at the VAS. 62,5% (40) of patients reported pain in 2 or more sites.

Conclusions: Among older adults assisted in ambulatory care, pain is highly prevalent, involves multiple sites and has a high intensity. Routine evaluation of pain in geriatric outpatient setting maybe useful for improving the quality of care of this frail population.

PREVALENCE OF MUSCULOSKELETAL PAIN AND ITS CORRELATION TO FUNCTIONAL DISABILITY IN ELDERLY

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Background and aims: Different systems of body get weak in aging and this increases the dependence of adults to other. The pain and weakness decrease functional capacity and have some somatic and functional effects. The purpose of this study was to investigate the epidemiology of musculoskeletal pain and its correlation to functional disability in elderly.

Methods: In this cross-sectional study 1614 elderly participated. The study was done in Amir Cola (north of Iran) in 2011-12. The information was gathered by demographic, musculoskeletal pain and functional disability (Katz Scale) questionnaires. The data was analyzed by chi-square test using SPSS 18.

Results: Pain was reported in 82.4% of subjects that 47.5% was in upper body, 73.2% in lower body and 24.5% in head and neck. Shoulders were the most prevalent pain area in upper extremity (37.5%) and knees had the same role in lower extremity (63.1%). Pain was reported in 89.9% of females and 76.2% of males. The pain distribution in females had been as 60.9% in upper extremity, 84.3% in lower extremity and 34.2% in head & neck. The pain distribution in males had been as 36.5% in upper extremity, 64.1% in lower extremity and 16.4% in head & neck. In this study 3.7% of subjects had functional disability. There was no significant correlation between musculoskeletal pain and functional disability ($P=0.24$).

Conclusions: The results of current study showed high prevalence of musculoskeletal pain in elderly. Prevalence of pain in women was higher than in men. The most prevalent pain area was knee joint. This indicates the necessity of medical and rehabilitative interventions in form of prevention training. Lack of significant correlation between musculoskeletal pain and functional disability indicates that other factors such as psychological may be contributed in functional disability.

EFIC5-0933

Clinical pain states: Pain in the elderly

PAIN PREVALENCE IN ELDERLY BED-RIDDEN POPULATION OF HAMADAN, IRAN

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Backgrounds and Aims: Pain is a common complaint of the elderly. Between 25% to 50% of elderly in communities have important pain problems. In Iran, a remarkable increase in aged people has occurred in the recent years, as the population over 60 years increased from 7.22% (2006) to 8.20% (2011). This study was conducted to evaluate pain prevalence in hospitalized elder population in Hamadan-Iran.

Methods: In this descriptive-analytic cross sectional study, 120 bedridden patients older than 65 years admitted in governmental hospitals in Hamadan-Iran were studied during three months (May-July 2013).

For evaluating pain in the patients, we used FPS-R (Faces Pain Scale-Revised) and NRS

(Numerical Rating Scale). All participants' information gathered in a checklist and analyzed using SPSS 16 software.

Results: All patients (100%) had some degree of pain, among them 115 (96%) had a persistent pain started more than three months ago. Mean pain intensity in participants was similar with both scales (6.7 with FPS-R scale and 6.5 with NRS). There was a strong correlation between two scales using Pearson correlation method ($r = 0.735$, $P < 0.001$). Analyzing pain intensity between men and women did not show any significant difference (6.53 in men, 7 in women by FPS-R [$P = 0.15$], and 6.56 in men, 6.97 in women by NRS, [$P > 0.32$]).

Conclusions: Pain is a common problem in elders in Hamadan-Iran. Pain intensity in most participants was higher than median. FPS-R and NRS (self-rating pain scales) resulted in similar results indicating that both scales are appropriate for measuring pain intensity in elders.

AN OBJECTIVE, QUANTITATIVE INDEX OF HOW EXPECTATION INFLUENCES AN INDIVIDUAL'S EXPERIENCE OF PAIN.

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Background: Although it is well established that expectations of pain shape the experience of pain, we do not currently have a method of quantifying the size of this effect at the level of the individual. An objective, individual index of this effect could be useful in phenotyping participants in clinical trials and personalising medical decisions.

Methods: 16 healthy individuals participated in an experiment where their prior expectations relating to upcoming electrical pain stimulation were manipulated. Participants were presented with cues which (accurately) described the probabilities with which either two or four intensities of pain would be administered. They then received a shock equivalent to one of the cued pain intensities, and were asked to rate their pain experience on a visual analogue scale.

Results: The factors that influenced pain ratings were investigated with a multiple regression model with the following predictors: participant, administered pain intensity, expected pain intensity, prediction uncertainty, and the size and sign of the prediction error. Only participant, the administered pain intensity (Figure 1.) and the sign of the prediction error (Figure 2.) significantly predicted pain ratings at the group level. Notably, the impact of prediction error sign was small (Cohen's $d=0.2$). At the individual level, prediction error sign significantly predicted pain ratings in 12/16 participants (Figure 3.).

Conclusions: Our protocol provides an objective, quantitative index for the effect of expectation on the experience of pain at both the group and the individual level.

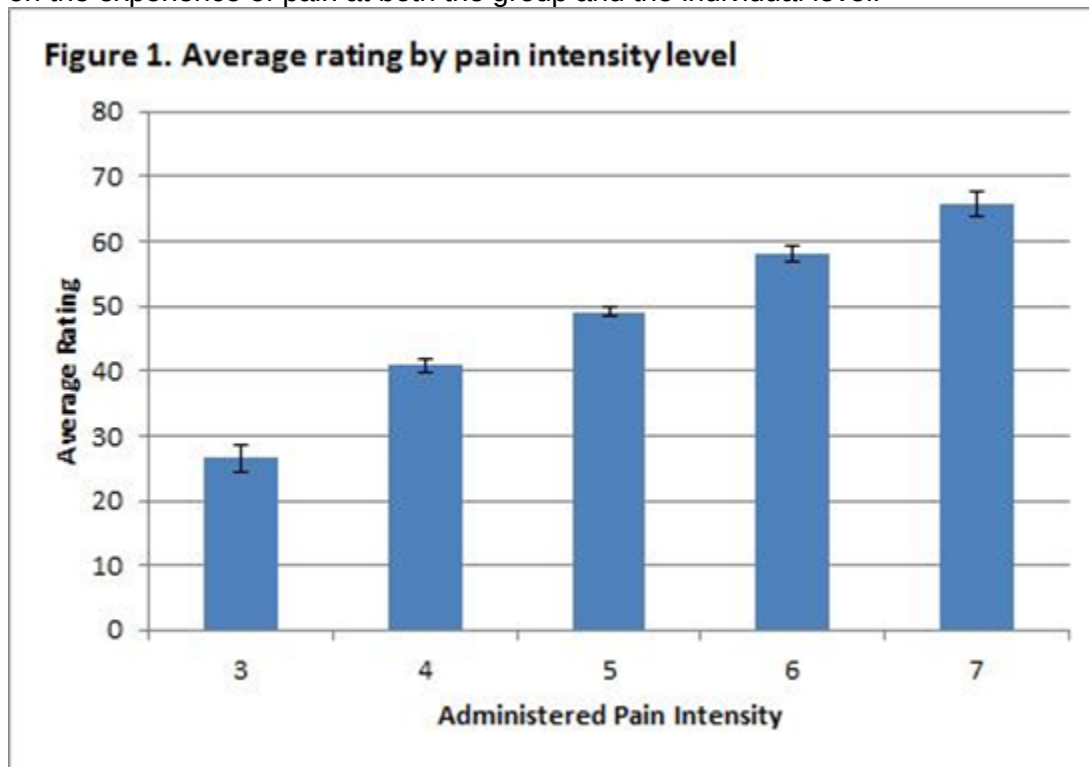


Figure 2. Rating of pain intensity 5 by prediction error

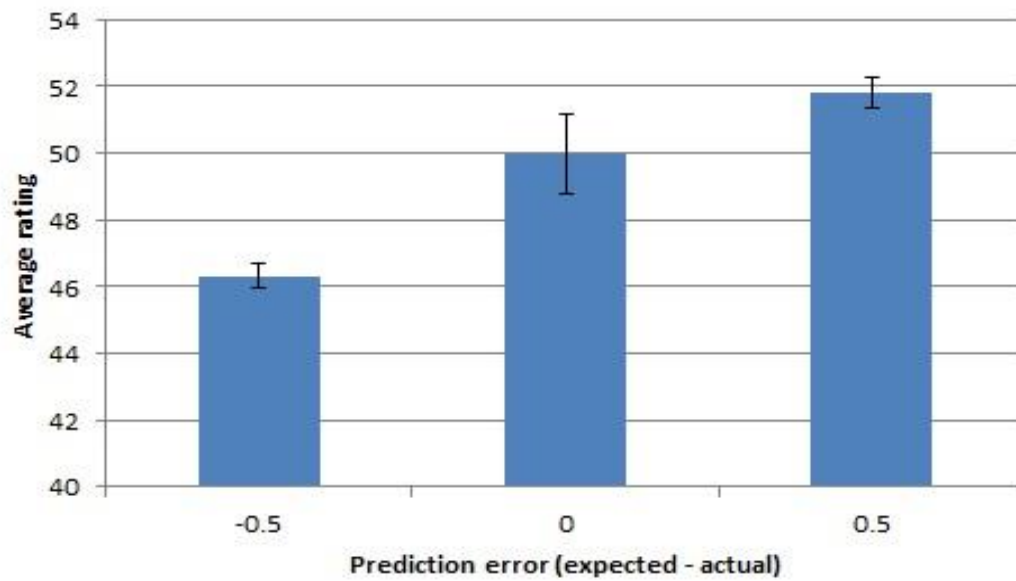
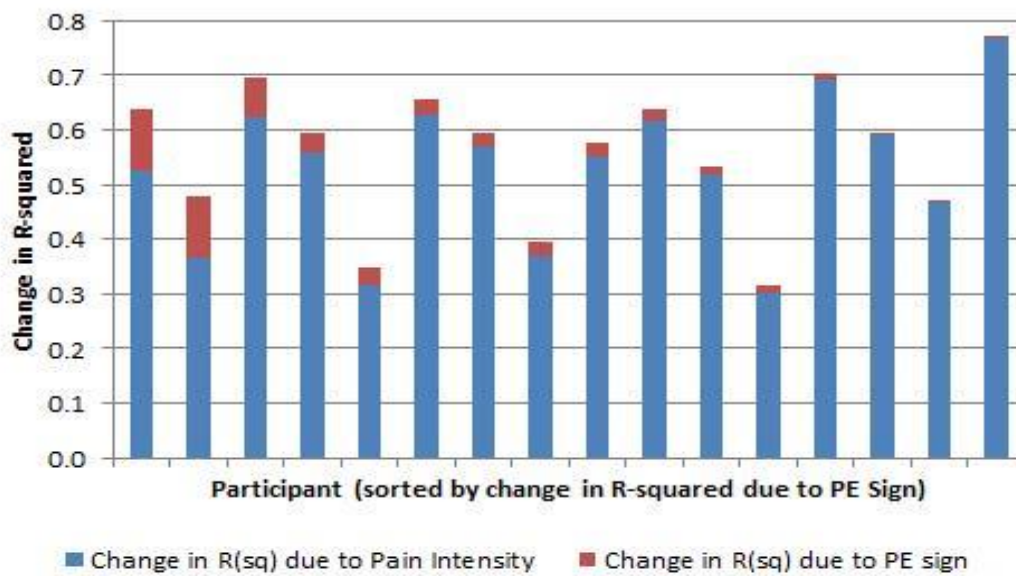


Figure 3. Change in R-squared by participant



**DYSFUNCTIONAL DA RESPONSES TO REWARD IN FIBROMYALGIA - A 11C
RACLOPRIDE PET STUDY**

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Pain and reward are mediated by similar neural pathways in the central nervous system, that involve among others the mesolimbic dopamine (DA) system. Recent evidence suggests that chronic pain might impair reward processing. Reduced DA function and reduced responses to rewards were also evidenced in depression. Fibromyalgia syndrome (FMS) is frequently associated with major depressive disorder (MDD). Therefore reduced DA reaction to reward could be involved in depressive or pain symptoms observed in FMS. Aim of the study was firstly to test whether striatal DA responses to monetary rewards is impaired in FMS patients compared to healthy controls, and secondly whether this reduction would be pronounced in FMS patients with MDD.

Differences in regional D2/3 receptor binding potential (DBP) between an unpredictable reward condition and a sensorimotor control condition were recorded in 24 female FMS patients (11 with MDD) and 17 healthy controls, using the bolus-plus-constant-infusion 11C raclopride method. The DBP was assessed in striatal regions-of-interest and compared between FMS patients with and without MDD and healthy controls.

We found a greater DBP, presumably reflecting increased DA release, in the reward vs. the control condition in the right nucleus accumbens in FMS patients with co-morbid MDD compared to healthy controls ($p=0.025$), and a greater DBP in the right caudate in FMS patients with co-morbid MDD relative to those without MDD.

The results showed an increased reaction to reward in FMS patients that was more accentuated in patients with MDD, suggesting dysfunctional DA responses associated with chronic pain.

EFIC5-0460

Human behavioural science: Affective modulation

ANXIETY AND DISSOCIATION DIFFERENTIALLY AFFECT PAIN PERCEPTION AMONG PATIENTS WITH POSTTRAUMATIC STRESS DISORDER

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Background and aims: Posttraumatic stress disorder (PTSD) and chronic pain often co-occur and exacerbate each other. Elucidating the mechanism of this co-occurrence has thus clinical importance. Previously, PTSD patients with chronic pain were found to demonstrate a unique, paradoxical pain profile; hyper-responsiveness along with hyposensitivity to pain. Our aim was to examine whether two seemingly paradoxical facets of PTSD- anxiety and dissociation- underlie this paradoxical profile.

Methods: PTSD patients (n=32) and healthy controls (n=43) underwent testing of heat- and pressure-pain thresholds and rating of suprathreshold stimuli, and completed questionnaires.

Results: PTSD patients had higher pain thresholds and higher pain ratings to suprathreshold stimuli than controls. Pain thresholds were positively associated with dissociation level and negatively associated with anxiety sensitivity level. Experimental pain ratings were positively associated with anxiety level. Chronic pain intensity was associated with anxiety, anxiety sensitivity and pain catastrophizing.

Conclusions: It appears that reduced conscious attention towards incoming stimuli, resulting from dissociation, causes delayed response in pain threshold measurement while biases towards threatening stimuli and decreased inhibition, possibly due to elevated anxiety, are responsible for intensification of experimental and chronic pain. The paradoxical facets of PTSD seem to reinforce the coexistence of PTSD and chronic pain, and should be considered when treating traumatized individuals.

PREVALENCE OF EARLY CHILDHOOD ADVERSITIES IN FIBROMYALGIA AND OTHER FORMS OF CHRONIC WIDESPREAD PAIN: A COMPARISON WITH OTHER FUNCTIONAL SYNDROMES, ORGANIC DISORDERS AND HEALTHY CONTROLS

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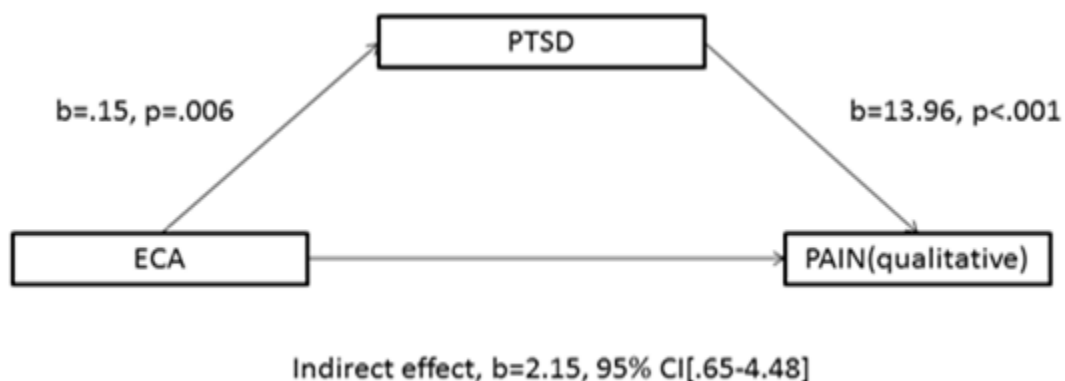
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Objective: To investigate the prevalence of different types of early childhood adversities (ECA) and posttraumatic stress disorder (PTSD) in Fibromyalgia and Chronic Widespread Pain (FM/CWP) as compared to Functional Dyspepsia (FD), another highly prevalent functional somatic syndrome, Achalasia (ACH), an organic disorder, and healthy controls (HC). Secondly, to investigate the influence of ECA and PTSD on pain severity in FM.

Methods: In total 202 female FM/CWP, 108 FD and 100 ACH patients were recruited. The HC sample consisted of 136 participants recruited by advertisement. All variables were measured through validated self-report questionnaires: Childhood Trauma Questionnaire, Self Rating Inventory for PTSD and McGill Pain Questionnaire.

Results: Forty-nine percent of FM/CWP patients scored above the cutoff for at least 1 type of ECA, compared with 36.9% of FD, 24.7% of ACH patients and 16.5% of healthy controls. We found that FM/CWP did not differ significantly from FD on the prevalence of most types of ECA, but ECA were significantly more prevalent compared to both ACH and HC groups. However, FM/CWP patients were 6 times more likely to report PTSD than FD. Contrary to a history of ECA, PTSD co-morbidity in FM/CWP was strongly associated with higher self-reported qualitative and quantitative pain severity.

Conclusion: In this study we found a high prevalence of early childhood adversities in FM/CWP but this group differed from other groups especially on PTSD. Further, ECA was not directly related to pain intensity reports in FM/CWP but this relationship was mediated by PTSD.



OPTIMISM AND PESSIMISM ON A GROUP OF NO-MALIGNANT CHRONIC PAIN PATIENTS AND ITS RELATIONSHIP WITH PAIN INTENSITY AND THE LEVEL OF SATISFACTION WITH THE THERAPY

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Background and aims: There is a relation among optimism, pessimism, coping and adjust of chronic pain patients. Considering the subjective nature of pain and self-assessment of pain intensity and satisfaction, we find a relationship amongst optimism and pessimism and response of patients to treatment in a self-assessment setting.

Methods: Using the Life Orientation Tes-Revised, we interviewed 189 patients with non-malignant chronic pain to assess the degree of optimism and pessimism. We also measure pain intensity using VAS and satisfaction on a 4-points Likert-type scale.

A = I agree a lot

B = I agree a little

C = I neither agree nor disagree D = I DISagree a little.

E = I DISagree a lot

1. In uncertain times, I usually expect the best. [2. It's easy for me to relax.]
3. If something can go wrong for me, it will. 4. I'm always optimistic about my future.

[5. I enjoy my friends a lot.]

[6. It's important for me to keep busy.]

7. I hardly ever expect things to go my way.

[8. I don't get upset too easily.]

9. I rarely count on good things happening to me.

10. Overall, I expect more good things to happen to me than bad.

Results: Greater optimism was significantly associated with higher satisfaction with the therapy but not with lower pain intensity.

Conclusions: We conclude that dispositional optimism plays a key role in patient's level of satisfaction with the therapy, could not predict the response of patients to pain therapy.

BOLD-SIGNAL REPRESENTATION OF INCISIONAL AND INFLAMMATORY PAIN IN RAT BRAIN AFTER ELECTRICAL AND MECHANICAL STIMULATION

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Background and aims: The aim was to investigate the BOLD-response in pain-specific brain regions in incisional and inflammatory rat models during hindpaw electrical stimulation (ES) and mechanical stimulation (MS).

Methods: Adult Sprague Dawley rats (n=28) received an experimental incision, inflammation or sham incision in the right hindpaw 24h before magnetic resonance measurements were performed on a 9.4T Bruker Biospin with EPI sequence (TR/TE:1000/18ms, 1.2mm thick, FOV 30*30mm², Matrix 80*80, 600 averages). ES and MS were applied to the injured hindpaw with a block design paradigm of 10s stimulation and 20s rest (20 cycles). The time courses were extracted from delineated ROIs on selected regions.

Results: BOLD signal changes were explored in Cingulus, Primary somatosensory cortex, Thalamus, Retrosplenial cortex and Periaqueductal grey; the time courses show a signal increase for all groups during stimulation. Comparing the two modes of stimulations, the time courses under MS were in all regions nicely distinguished for different injury/sham groups with significantly higher response for inflammation compared to incision and sham group, respectively (U-test, P<0.05). When the initial response to pain was strong a biphasic pattern of response was evident.

Conclusions: The present study shows for the first time differences between electrically and mechanically induced brain pain responses after for different types of painful injuries in rats. The response of the sham group to both stimulations differs from pain models; interestingly, differences between pain models are more sensible with MS. The biphasic pattern of responses has been previously observed in humans but not animals and needs further investigation.

EFIC5-0570

Basic Science (Anatomy/physiology/pharmacology/behaviour): Imaging – animals

AN FMRI STUDY OF ALLODYNIA-SPECIFIC PAIN EVALUATION.

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Introduction:

Fibromyalgia disorders characterized by chronic pain induce the pathological condition 'allodynia', in which a stimulus that is normally not painful causes pain sensations. Recently, a 'reserpine-induced myalgia (RIM) rat', an animal model of fibromyalgia manifested by chronic muscular pain together with tactile and heat allodynia, was developed, and is expected to facilitate research on fibromyalgia. A 532 nm green laser is transparent to water molecules and easy to use for local stimulation without direct contact, and thus is ideal for allodynia studies. The aim of this study is to establish a system to evaluate the brain activities responding to allodynic pain evoked by green laser stimuli, using the BOLD technique.

Methods:

To produce the RIM rats, a reserpine solution was injected into Sprague Dawley rats. Functional data were acquired from 5 RIM and 5 control rats with a 4-shot GRE-EPI sequence. The green laser was used to irradiate the left hind paws 5 times every 2 minutes. The Independent Component Analysis (ICA) was performed with the FSL software.

Results:

The ICA components with 2-minute intervals, which include the primary somatosensory cortex (1.7% signal enhancement), insular cortex (1.3%), thalamus (1.8%) and hippocampus (1.7%), were observed in only the RIM rats.

Conclusion:

We succeeded in detecting the allodynia-specific pain responses evoked by the laser stimulation. Our experimental methodology is expected to provide a robust clinical and preclinical evaluation system for new analgesic agents.

STRUCTURAL AND FUNCTIONAL CHARACTERISATION OF PERIPHERAL AXONS IN THE CAUDAL NERVE OF NEONATAL PIGS: PRELIMINARY DATA

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Background and aims: Early postnatal tail docking (amputation of 2/3rds of the tail) in piglets is performed as a preventative measure to minimize potential trauma associated with tail biting in older animals. The aim of this study was to investigate caudal nerve axonal composition and the effects of tail docking on axonal function in neonatal pigs.

Methods: Axonal composition was examined using Transmission electron microscopy (TEM). Functional assessment of A and C-fibre axons was performed *in vitro* using compound action potential (CAP) recordings from isolated nerve fascicles.

Results: TEM revealed both myelinated and unmyelinated axons in caudal nerves. Myelinated axons ranged in size from large diameter A β -axons to smaller diameter thinly myelinated Ad-axons. Unmyelinated C-fibre axons clustered together in Remak bundles. Caudal nerves were harvested for functional assessment at 5 days of age from undocked tails and at 12.3 days (i.e. 9.3 days after docking) from docked pigs. The average A-fibre CAP amplitude from undocked tails was larger ($1599.6 \pm 552.9 \mu V$) and conducted more rapidly ($9.79 \pm 2.04 m/s$) than the A-fibres from docked tails (amplitude $1065.1 \pm 507.6 \mu V$ and c.v. $= 7.78 \pm 2.57 m/s$). For C-fibres, the average axonal conduction velocity in docked tails was slower ($1.74 \pm 0.2 m/s$) than in undocked tails ($2.26 \pm 0.41 m/s$). Axonal conduction in caudal nerve C-fibres from both intact and docked animals was completely blocked by 500 nM tetrodotoxin (TTX) suggesting conduction was mediated primarily by TTX-sensitive NaV-isoforms.

Conclusions: As a proof of principle study, it is possible to functionally assess A- and C-fibre axons in pig caudal nerve using electrical axonal excitability techniques.

Acknowledgments: ANIWhA.

EFIC5-0980

Clinical pain states: Sex specific pain

DYSMENORRHEA: NOT JUST PERIOD PAIN

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Background and Aims: Primary dysmenorrhea, or painful menstruation in the absence of pelvic pathology, is a common, and often debilitating, gynecological condition that affects 45-95% of menstruating women. Despite the high prevalence, dysmenorrhea is often poorly treated, and even disregarded, by health professionals, pain researchers, and women themselves, who may accept it as a normal part of the menstrual cycle. **Methods:** Various randomised controlled studies we conducted to further our knowledge, particularly with regards to the impact and consequences of recurrent primary dysmenorrheic pain on pain sensitivity, mood, quality of life and sleep. **Results:** Dysmenorrheic pain has an immediate negative impact on quality of life, for up to a few days every month. Women with dysmenorrhea have a significantly reduced quality of life, poorer mood and poorer sleep quality, during menstruation compared to their pain-free follicular phase, and compared to the menstruation phase of asymptomatic women. Women with, compared to women without, dysmenorrhea, have greater sensitivity to experimental pain both within and outside areas of referred menstrual pain, even in phases of the menstrual cycle when they are not experiencing menstrual pain. This enhanced pain sensitivity may increase susceptibility to other chronic pain conditions in later life. The prescribed first-line therapy for menstrual pain remains non-steroidal anti-inflammatory drugs, which are effective in relieving daytime and night-time pain. **Conclusions:** Dysmenorrhea has immediate and potentially long-term consequences for women's health. Further studies are needed to determine whether effectively blocking dysmenorrheic pain ameliorates risk for the development of chronic pain disorders.

EFIC5-0088

Clinical pain states: Sex specific pain

SEXUAL DYSFUNCTION IN WOMEN WITH MIGRAINE AND TENSION-TYPE HEADACHES

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Aims: Primary headaches (PHA) prominently affect the performance and life quality of people. Sexual dysfunction (SD) is an important health problem caused by several factors. This study aimed to compare the sexual functions of women who have PHA.

Materials-methods: 41 female patients who were diagnosed with migraine, 39 female patients who were diagnosed with tension-type headache (TTHA) and 41 healthy subjects were included in study. Sexual functions of the cases were evaluated by using "Female Sexual Function Index (FSFI)". Beck Depression Scale (BDS) was applied to subjects and those who were diagnosed with depression were excluded from the study.

Results: SD was detected in both the migraine and TTHA groups. FSFI subgroup scores were statistically significantly lower in migraine and TTHA groups compared to control group. No significant differences were detected between the migraine and TTHA groups in terms of FSFI and its components. In addition, no significant differences were detected between the blood prolactin levels or SD and headache.

Conclusion: It was concluded that primary headaches (which are chronic diseases) itself may cause SD in female patients with migraine and TTHA independently of factors that may cause development of SD such as comorbid condition, depression, drug use and age

EFIC5-0144

Clinical pain states: Sex specific pain

PAIN AND FUNCTIONS IN PATIENTS WITH HIP AND KNEE OSTEOARTHRITIS

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Introduction: Osteoarthritis (OA) of the knee and hip affects a greater percentage of women than men and can severely impact a person's function and pain.

The aim: To establish the differences in difficulties in doing everyday activities in of women and men with knee and hip osteoarthritis, as well as the differences in subjective feeling of pain.

Material and methods: The research included 60 patients (66,27± 10,32 yrs), with hip and knee osteoarthritis of both sexes (29 m, 31w), treated in the Clinic For Medical Rehabilitation, Clinical Center of Vojvodina. The following questionnaires were used in the examination. Womac /The Western Ontario and Mc Master Universities Osteoarthritis index), BPI (Brief pain Inventory).

Results. 42(70%) patients had moderate to severe pain, which was estimated by Womac questionnaire. Significant limitations while doing every day activities were discovered in 25(41,7%) patients with hip and knee OA according to Womac. In 16 (27%) patients the pain had strong influence on their everyday activities (BPI). The BPI Intensity scores showed women had significantly more intense pain during movement compared to men's (p <0.01). Results of the research show statistically significant difference in term of pain (BPI, Womac) and difficulties in doing everyday activities between the women and men patients with hip and knee osteoarthritis (p <0.01).

Conclusion: The anatomical localization of degenerative changes does not influence the individual pain intensity, stiffness and difficulties in doing everyday activities. Our results show that women have greater pain, and reduced function when compared to men.

DYNAMICS OF DESCENDING PAIN MODULATORY SYSTEMS DIFFER AMONG BDNF VAL66MET POLYMORPHISMS IN PRIMARY DYSMENORRHEA

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Primary dysmenorrhea (PDM) is common for women in the reproductive age and may be considered as a genuine chronic pain condition. We previously found that PDM is associated with altered periaqueductal gray matter (PAG)-seeded functional connectivity. The PAG reveals hypo-connectivity with the key regions of the descending pain modulatory systems, while hyper-connectivity with the sensorimotor cortex. Given the brain-derived neurotrophic factor (BDNF) as a pain modulator at PAG, the present study aims to investigate 1) the role of the *BDNF* Val66Met polymorphisms and 2) the genotype and phenotype interaction on the descending pain modulatory systems in the context of PAG-seeded functional connectivity. Fifty-six PDMs and 60 controls were conducted resting-state fMRI, and blood samples were taken for the genotyping. Different *BDNF* polymorphisms engaged different cortical modulatory pathways in controls, however, the PAG was significantly connected with sensorimotor or occipitotemporal cortex in PDMs. Notably, only the Met/Met PDMs did not exhibit cortico-PAG connectivity. Our data indicate that the *BDNF* Val66Met polymorphism may be associated with the expressions of the descending pain modulatory systems. Besides, there is genotype and phenotype interaction on the systems. When individuals suffer from repeated menstrual pain, the engagement of the systems will change, and different polymorphisms feature different dynamics. Such dynamics of different genotypes may underpin individual differences of pain experiences and behaviors of PDMs in specific and chronic pain patients in general. This study was supported by Taipei Veterans General Hospital (V100D-001, V100D-001-1, V100D-001-2) and Ministry of Science and Technology (100-2314-B-010-006-MY3, 100-2629-B-010-001, 101-2629-B-010-001, 102-2629-B-010-001, 103-2321-B-010-020).

EFIC5-0399

Clinical pain states: Sex specific pain

GENDER FEATURES OF VERTEBRAL PAIN SYNDROME DEPENDING ON BONE MINERAL DENSITY

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The aim is to study the frequency of vertebral pain syndrome in men and women of older age groups depending on the bone mineral density (BMD).

Materials and methods. We have examined 1934 people aged 50-89 years, among them 1697 women and 237 men. The frequency of back pain syndrome was studied depending on the BMD. BMD at all sites was measured by DXA using a Prodigy densitometer (GE).

Results. The frequency of pain syndrome among older age groups is significantly higher in women compared with men (88.3% (1499/1697) vs 84.8% (201/237), accordingly, $p=0.01$). In women of 50-89 years, with osteoporosis and no fractures in their anamnesis, pain syndrome in the thoracic and lumbar spine is significantly higher in comparison with women who have osteopenia ($p=0.01$) and normal BMD ($p=0.02$) and compared to men with a similar BMD state (osteoporosis; 91.8% (337/367) vs 76.2% (16/21), accordingly, $p=0.01$)).

The frequency of pain syndrome in the thoracic and the lumbar spine in women is associated with BMD. The presence of osteoporosis increases the risk of pain syndrome in the thoracic spine (RR=1.27, 95% CI: 1.12-1.44, $p=0.0001$). In older women, the presence of low-energy fractures significantly impacts the increasing frequency of pain in the thoracic region regardless of the BMD state.

Conclusion. The frequency of pain among older age groups is significantly higher in women compared with men. In women of older age groups, the presence of low-energy fractures significantly increases the frequency of pain in the thoracic region, regardless of the state of BMD.

EFIC5-0443

Clinical pain states: Sex specific pain

SEXUAL DYSFUNCTION ASSOCIATED WITH DAILY OPIOID USE.

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Introduction. Sexual dysfunction (SD) is highly prevalent associated to long-term treatment with opioids in chronic non-cancer pain (CNP). Many patients do not report their symptoms, thus causing this adverse effect to go unnoticed and without clinical monitoring. The purpose was to investigate the occurrence of male and female sexual dysfunction.

Material and methods: A cross-sectional pilot study was carried out in moderate-severe CNP patients (n=223, 143 women, 90 men) treated with long-term opioids (>12 months) in our Pain Unit, along 2 years. Standardized questionnaires and medical record reviews were used to assess rates of pain diagnosis, opioid adverse effects (ADRs) including sexual function by Female Sexual Function Index (FSFI) and International Index of Erectile Function (IIEF) questionnaires and drug use.

Results. A prevalence of 4% of SD was found in CNP patients. 143 females were included (mean age 58±12.3 years, VAS 6.2±2.7, 65% married), 43% were sexually active, 81% of who reported FSD (IFSFI total 15±5 scores), resulting in 19% who were sexually active without impairment (IFSFI total 21±8 scores). In 90 males (mean age 56±10.6 years, VAS 5.7.1±2.3 married 76%), IIEF scores was divided in two groups: (I) normal or mild ED>16 scores (34.17 ±11.67); (ii) moderate or severe: IIEF <16 scores (6.32±3.67), resulting in 20 % who were sexually active without impairment. Drug use was: 20% analgesic, 41% tramadol, 74% opioids and 70% some adjuvants.

Conclusions. Sexual functioning is a problem in CNP. Evidence-based interventions to support sexual activity and function in women and men with CNP are needed

EFFECTIVENESS OF KINESIOTAPING ON PRIMARY DYSMENORRHEA

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Primary dysmenorrhea is a common and debilitating condition for women. Various treatment strategies including medication and physiotherapy modalities have been used to manage this condition. Kinesio Taping is a treatment method to decrease pain in musculoskeletal disorders. However, taping techniques have not been investigated widely in primary dysmenorrhea. The aim of this study was to determine the effects of Kinesio Taping on pain and quality of life in patients with primary dysmenorrhea. Twenty female patients with primary dysmenorrhea were enrolled in the study. Twenty female patients with primary dysmenorrhea were recruited as the control group. Participants assigned to the intervention group received taping twice a week for three consecutive menstrual cycles. Short Form McGill Pain Questionnaire was used to measure pain during menstruation. Health related quality of life was measured by Short Form 36 (SF-36) Health Survey. According to the McGill pain questionnaire, there was significant improvement in 'sensory dimension of pain experience' and 'visual analogue scale' after Kinesio Taping treatment when compared to baseline scores ($p < .05$). There was no improvement in 'affective dimension of pain experience' and 'present pain index' subscales. There was significant improvement only in physical functioning measured by SF-36 ($p < .05$). There was no improvement in pain and quality of life in the control group. Kinesio Taping may be an effective method of alleviating menstrual pain and physical impairment during menstruation. This method may be recommended as a strategy for coping with primary dysmenorrhea.

RESPONDERS TO THE THERMAL GRILL PARADIGM DISPLAY HIGHER VAGAL REACTIVITY THAN NON-RESPONDERS

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Background and aims : We have previously uncovered that higher prefrontally modulated vagal activation, a proxy for better emotional adaptation, predicts the occurrence of the thermal grill illusion of pain (TGI), standing for pain induced by a mixture of non-noxious cold and warm stimulation. In the present study we aimed to investigate the magnitude of vagal reactivity to thermal grill stimuli in the responders and non-responders to the thermal grill.

Methods: Our sample included 31 healthy volunteers. All participants were stimulated during one minute with the temperatures of 15°C and 41°C set at the interlaced cold and warm bars of the water-bath driven thermal grill. This stimulation was repeated three times. Blood pressure and heart rate were recorded concomitantly. Numerical rating scales (NRS; 0–100) were used to quantify subjective pain intensity and pain unpleasantness perceptions.

Results: The linear mixed model analyses mainly revealed that blood pressure was significantly lower [$F(12.53)$, $p < .001$] over time [$F(6.35)$, $p < .005$] in the group of the responders ($N=13$) than in the non-responders ($N=18$) to thermal grill stimulation. Baroreflex and vagal reactivity values in contrast were higher in responders than in non-responders, without however reaching significance levels.

Conclusions: The present findings first show that, in accordance with our prediction, those who had revealed higher vagal activation in the psychophysiological baseline measurement, perceived the TGI during the subsequent thermal grill stimulation phases. Second and as compared to non-responders, vagal reactivity was increased in the responders all over the course of the experiment.

EFIC5-0053

Human behavioural science: Perception and psychophysics

PAIN SENSITIVITY AND TACTILE SPATIAL ACUITY ARE ALTERED IN HEALTHY MUSICIANS AS IN CHRONIC PAIN PATIENTS

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Background and aims:

Professional musicians frequently experience musculoskeletal pain and pain-related symptoms during their careers. Extensive training of repetitive and highly skilled movements, as in professional music training, may lead to changes in tactile sensitivity and corresponding cortical reorganization of somatosensory cortices. The present study aimed at investigating the interaction between chronic pain and music training with respect to somatosensory processing.

Methods:

Tactile thresholds (mechanical detection, grating orientation, two-point discrimination) and subjective ratings to thermal and pressure pain stimuli were assessed in 17 professional musicians with chronic pain, 30 pain-free musicians, 20 non-musicians with chronic pain, and 18 pain-free non-musicians. Analyses of variance (ANOVAs) were used to assess the interactions between subjects-factors MUSICIAN (musicians vs. non-musicians) and PAIN (chronic pain vs. pain-free individuals), and within-subjects factor HEMIBODY (left vs. right hand).

Results:

Pain-free musicians displayed lower mechanical detection thresholds ($p < .001$), higher grating orientation thresholds ($p < .001$) and increased pain ratings to pressure ($p < .05$) and heat ($p < .001$) compared to pain-free non-musicians. Also, musicians and non-musicians with chronic pain presented higher grating orientation thresholds ($p < .01$) and increased pain ratings to pressure ($p < .01$) and heat compared ($p < .01$) to pain-free non-musicians.

Conclusions:

The significant increment of pain sensitivity together with decreased spatial discrimination in pain-free musicians and the similarity of results found in chronic pain patients, suggests that the extensive training of repetitive and highly skilled movements in classical musicians could be considered as a risk factor for developing chronic pain, probably due to plastic changes elicited in somatosensory pathways and brain areas.

PSYCHOLOGICAL FACTORS AND CONDITIONED PAIN MODULATION: A META-ANALYSIS

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Background. While conditioned pain modulation (CPM) responses seems to be affected by psychological factors such as anxiety, depression and pain catastrophizing, most studies on CPM do not address these relations as their primary outcome. The aim of this meta-analysis was to analyze the findings regarding the interrelations between the CPM responses and psychological factors in both healthy subjects and pain patients.

Method. After a comprehensive PubMed search, 37 articles were suitable for inclusion. Analyses employed DerSimonian and Laird's random effects model on Fisher's z-transforms of correlations; potential publication bias was tested using funnel plots and Egger's regression test for funnel plot asymmetry. Six meta-analyses were performed examining the correlations between anxiety, depression, and pain catastrophizing, and CPM responses in healthy subjects and pain patients.

Results. CPM responses were not significantly correlated with any of the examined psychological factors. However, a secondary analysis, comparing modality-specific CPM responses and psychological factors in healthy subjects revealed that (i) pressure-based CPM responses were correlated with anxiety levels (grand-mean correlation in original units $r = -0.1087$, 95% confidence limits -0.1752 to -0.0411); (ii) heat-based CPM with depression ($r = 0.2443$, 95% confidence limits 0.0150 to 0.4492); and (iii) electrical-based CPM with pain catastrophizing ($r = -0.1501$, 95% confidence limits -0.2403 to -0.0574).

Conclusions. Certain psychological factors seem to be associated with modality-specific CPM responses in healthy subjects. This potentially supports the notion that CPM paradigms evoked by different stimulation modalities represent different underlying mechanisms.

THE ROLE OF THE RIGHT TEMPOROPARIETAL JUNCTION IN THE ELICITATION OF VICARIOUS EXPERIENCES AND DETECTION ACCURACY WHILE OBSERVING PAIN AND TOUCH

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Background and aims: This study investigated the effects of observing pain and touch in others upon

vicarious somatosensory experiences and the detection of subtle somatosensory stimuli.

Furthermore, the role of the right tempoparietal junction (rTPJ) was investigated, by means of tDCS methodology, as this brain region is suggested to be involved in perspective taking and self-other distinction.

Methods: Undergraduates (N=22) viewed videos depicting hands being touched, hands being pricked, and control scenes (same approaching movement as in the other video categories but without the painful/touching object), while experiencing vibrotactile stimuli themselves on the left, right, or both hands. Participants reported the location at which they felt a somatosensory stimulus. Vibrotactile stimuli and visual scenes were applied in a congruent or incongruent way. During three separate testing sessions, excitability of the rTPJ was modulated with tDCS (cathodal, anodal or sham). We calculated the proportion of correct responses and false alarms (i.e., number of trials in which a vicarious somatosensory experience was reported congruent to the site of the visual information).

Results: Pain-related scenes facilitated the correct detection of tactile stimuli and augmented the number of vicarious somatosensory experiences compared with observing touch or control videos. Stimulation of the rTPJ had no reliable influence upon detection accuracy or the number of vicarious errors.

Conclusions: This study indicates that somatosensory detection is particularly enhanced during the observation of pain-related scenes compared to the observation of touch or control videos. Contrary to our expectations, the rTPJ did not modulate detection accuracy.

MAPPING SUBJECTIVE DIMENSIONS OF PAIN ONTO ELECTRICAL BRAIN RESPONSE TO NOXIOUS LASER HEAT STIMULUS.

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A detailed subjective map of pain experience and its representation in the human brain are poorly understood. To shed light on the cortical representation of a multifaceted pain experience in humans, we combined multivariate analysis of subjective aspects of pain sensations with detailed, single-trial analysis of electrophysiological brain responses.

Participants were asked to fully focus on any painful or non-painful sensations occurring in their left hand during an interval surrounding the onset of noxious laser heat stimuli, and to rate their sensations using a set of ten visual analogue scales. Statistical parametric mapping was used to compute a multivariate regression analysis of subjective responses and single-trial laser evoked potentials (LEPs) at subject and group levels.

Factor analysis of subjective responses yielded five factors. Factor 1, representing pricking-heat pain, mapped firstly as a negative potential at the vertex and a positive potential at the fronto-temporal region during the 208–260 ms interval, and secondly as a strong negative potential in the right lateral frontal and prefrontal scalp regions during the 1392–1432 ms interval. Three other factors, labelled anticipated pain, stimulus onset time, and body sensations, represented non-specific aspects of the pain experience, and explained portions of LEPs in the latency range from 200 ms to 700 ms.

The subjective space of pain during noxious laser stimulation is represented by one large factor featuring pain intensity, and by other factors accounting for non-specific parts of the sensory experience. Pricking-heat pain is encoded in two separate latency components with different scalp and brain representations.

TOLERABILITY TO PAIN IS ASSOCIATED WITH DECREASED CONDITIONED PAIN MODULATION: A HEALTHY VOLUNTEERS STUDY

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Background: There is tremendous variability in the perception of pain produced by an identical noxious stimulus across individuals. This study investigated the profile of pain sensitivity and endogenous pain inhibition measured by conditioned pain modulation (CPM) in two distinct subgroups that were sorted from a large cohort of healthy subjects based on their tolerability to cold stimulation.

Methods: Data from 486 subjects was retrieved from a pool of studies conducted in our laboratory. Pain tests included heat and cold stimulations and CPM paradigm.

Results: The mean cold pain tolerance of the total sample was 46.5 ± 48.0 sec, (range 4-180 sec). Of those, two extreme subgroups were sorted: 'tolerant' including 8% of the sample ($n=41$) who reached the cut-off time (180 sec), and a size-matched 'intolerant' that were at the other edge of the tolerance time range (≤ 11 sec, mean $\pm$ SD 8.7 ± 2 sec). Significant differences between subgroups were found in all thermal tests ($p < 0.001$) implying that the 'tolerant' is insensitive to pain. CPM magnitude was significantly lower in the 'tolerant' compared to the 'intolerant' (15 ± 17 vs. 24 ± 15 , respectively; $p = 0.001$). Interestingly, pain intensity induced by the conditioning stimulation and the first test pain (part of the CPM paradigm) were significantly lower in the 'tolerant' compared to the 'intolerant' (conditioning: 36 ± 22 vs. 82 ± 20 , respectively; $p < 0.001$; test pain 31 ± 25 vs. 64 ± 25 respectively; $p < 0.001$).

Conclusions: Tolerability to pain is associated with insensitivity to multimodal evoked pain. Also, tolerant individuals have a different pain inhibition profile that can be explained by their general low pain perception that avoids 'turning on' endogenous pain inhibition.

NEGATIVE ILLNESS PERCEPTION AND A PRO-NOCICEPTIVE PAIN MODULATION PROFILE AUGMENT CHRONIC PELVIC PAIN SYNDROMES

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Background and aims: Pain-related psychosocial and behavioral characteristics are common in women who suffer from chronic pelvic pain syndrome (CPPS). This study aimed to explore whether the negative illness perception in Painful Bladder Syndrome (PBS) and Provoked vestibulodynia (PVD) patients is associated with a pro-nociceptive pain modulation profile (PMP), as well as enhanced severity of the clinical CPPS.

Methods: CPPS patients (n=39) completed the Illness Perception Questionnaire Revised (IPQ-R) and the Urgency Severity and Life Impact Questionnaire (USIQ). Heat pain thresholds, mechanical temporal summation (mTS), and conditioned pain modulation (CPM) were tested at the forearm. Pain evoked by intercourse and stimulation of the trigger point at the pelvic floor were used to indicate the severity of CPPS.

Results: Negative illness perception expressed by CPPS patients as chronic and harmful feelings towards their situation were correlated with less-efficient CPM ($r=.488$, $p=0.002$ and $r=0.359$, $p=0.025$, respectively). Lower sense of controllability toward CPPS was correlated with enhanced mTS ($r=0.365$, $p=0.022$). Enhanced perception of CPPS as being a chronic condition was correlated with higher mechanical and trigger point evoked pain scores ($r=0.405$, $p=0.011$ and $r=0.366$, $p=0.028$, respectively).

Conclusions: Our findings point to the unique role of cognitive representations and psychological factors in determining the individual PMP, as well as the clinical CPPS manifestation. These observations suggest that CPPS women with a negative illness perception and a pro-nociceptive PMP necessitate suitably tailored interventions in which their cognitive and emotional representations of CPPS are taken into consideration.

THE ASSOCIATION BETWEEN ANXIETY AND PAIN PERCEPTION IS MEDIATED VIA ACTIVITY IN THE CAUDAL ANTERIOR CINGULATE CORTEX (CACC)-AN EXPLORATORY STUDY

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Background & Aims: Pain-related brain activation hint at the role of the limbic system in sex differences in pain perception. Yet, the effect of the emotional state and its brain related activity on experimental pain perception remains largely unknown. We applied structural equation modeling (SEM) to investigate whether the association between anxiety and pain ratings is mediated through the cACC and amygdala/hippocampus, generators of contact heat evoked potentials (CHEPs).

Methods: An innocuous (42°C) baseline and a target noxious (52°C) series of brief contact heat stimuli were administered to the left non-dominant volar forearm. CHEPs were simultaneously recorded. N2 and P2 components were analyzed, and their generators' activity determined using standardized low-resolution brain electromagnetic tomography (sLORETA). Thereafter, SEM was applied, separately for women and men, examining the mediatory role of the CHEPs' generators in the anxiety-pain perception association.

Results: Women exhibited greater P2 amplitudes and larger cACC activity, which were highly associated. In men however, P2 amplitude was strongly related to the activity in the amygdala and hippocampus, while only moderately associated with the activity in the cACC. SEM revealed a good fit between the cACC model and the data. The relationship between state anxiety and pain ratings was fully mediated in women via the effect of the cACC on the P2 amplitude.

Conclusion: Sexual dimorphism in brain activity related to anxiety may explain the differences found in CHEPs. Moreover, in women, the relation between the anxiety state and pain is mediated completely via the cACC, influencing the P2 evoked response.

BI-PHASIC ACTIVATION OF THE PRIMARY MOTOR CORTEX BY PHASIC PAIN

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Background & Aims. Noxious stimuli activate the primary motor cortex (M1) directly, or/and via its reciprocal connection with somatosensory and anterior cingulate cortices. Nevertheless, the time course of M1 activation was not explored. We aimed to test the time-course of M1 pain-related activity, and to elucidate its relationship with contact heat-evoked potentials (CHEPs).

Methods: CHEPs were evoked by brief noxious 52°C stimuli; volar forearm (27 females, 24.7±2.6 years). M1's activity was determined based on whole brain analysis of the responses to noxious vs. innocuous heat, using standardized low-resolution brain electromagnetic tomography. Correlation and regression analyses tested associations between M1 activation, CHEPs, and pain-related psychological variables.

Results: Bi-phasic activation of the M1 was observed; Peak1 at 264±27 msec, and Peak2 at 385±30 msec after stimulus onset. Latencies of Peak 1 and Peak 2 corresponded respectively to those of N2 (267±27 msec) and P2 (380±29 msec). Furthermore, M1 activity and CHEPs were simply correlated: Peak1 with N2 ($r=-0.789$, $p<0.0001$, amplitude; $r=0.449$; $p<0.019$, latency), Peak2 with P2 ($r=0.855$, $p<0.0001$, amplitude; $r=0.588$; $p<0.002$, latency). While simple correlation did not reveal relationships of catastrophizing or trait anxiety to Peak 1, multivariate regression on Peak1 amplitude indicated a significant relationship of N2 amplitude ($p<0.0001$) and a negative relationship of anxiety trait ($p=0.021$), a significant effect of pain catastrophizing ($p=0.016$), but not of pain ratings ($p=0.958$).

Conclusion: Bi-phasic M1 activity is associated with the sensory-discriminative (Peak1) and emotional/cognitive (Peak2) components of pain processing. N2-related limbic activity elucidates the influence of catastrophizing and anxiety on M1 activity.

RELATIONSHIP BETWEEN THE HEALTH LOCUS OF CONTROL AND PHYSICAL CAPACITY OF SPINE IN PEOPLE WITH NON-SPECIFIC LOW BACK PAIN

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Background and aims

Researchers have traditionally explained low back pain (LBP) with a model that mainly considers biomedical factors, however recent studies have demonstrated that cognitive and psychological factors are more significant. The health locus of control (HLOC) is one of the most frequently investigated psychosocial factors in LBP and is defined as the perceived control the individual has over his or her own health. The aim was to evaluate whether HLOC is related to physical capacity measured by specific spine tests.

Methods

The study sample was 30 people with non-specific LBP (11 female and 19 male, mean age; 33.9 ± 10.2). HLOC was measured with Multidimensional HLOC which includes three subscales to assess internal, powerful others external, and chance external HLOC. Physical capacity was measured with specific spine tests including the sit-and-reach for flexibility, the Sorensen, flexor endurance, and side bridge tests for endurance, partial curl-up and sit-up tests for strength. Correlation tests were performed to investigate the relationship between the HLOC and spine tests.

Results

There was only significant correlation between chance HLOC and sit-and-reach ($r = -0.456$, $p < 0.05$). The other correlational tests showed no significant correlation between the HLOC subscales and spine tests ($p > 0.05$).

Conclusions

The present study shows that only chance HLOC significantly correlated with flexibility. However there were no significant correlations between HLOC and the spine tests. The study suggests that HLOC would be related with psychological factors rather than physical capacity in people with non-specific LBP. The further studies should focus on the other factors.

INTRA-ORAL PSYCHOPHYSICAL AND PHYSIOLOGIC RESPONSES TO CINNAMALDEHYDE AND NICOTINE

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Background and Aim: Cinnamaldehyde and nicotine activate the transient receptor potential subtype A1 (TRPA1) receptor and can produce burning sensations. The aim was to determine if simultaneous release of cinnamaldehyde and nicotine to the intra-oral tissues results in desensitization or synergistic responses, such as enhanced burning sensations. **Methods:** Healthy non-smokers (N=22) received, in a randomized, double-blind, cross-over design one of three gums containing 4mg of nicotine polacrilex, 20mg of cinnamaldehyde, or 4mg of nicotine polacrilex and 20 mg of cinnamaldehyde. Blood flow of the lip, tongue, buccal mucosa, forehead, and hand and temperature of the tongue, forehead and hand were assessed before, during and following a 10-min chewing regime together with records of blood pressure, heart rate, taste experience and intra-oral pain/irritation area and intensity. **Results:** Cinnamaldehyde increased temperature but not blood flow in the tongue and was associated with burning sensations in the mouth and/or throat in only 10 out of 22 participants. Nicotine also increased intra-oral temperature and blood flow and produced burning sensations in the mouth and throat, but the combination with cinnamaldehyde did not differ from nicotine alone. However, those responding to cinnamaldehyde as an irritant had greater nicotine-evoked responses; especially in the throat. Furthermore, nicotine appeared to reduce the irritation evoked in the mouth by cinnamaldehyde. **Conclusions:** No synergistic effect of cinnamaldehyde and nicotine could be shown for the physiologic responses. Cinnamaldehyde and nicotine appear to evoke irritation differentially between the mouth and throat, and nicotine appears to mask the irritation qualities of cinnamaldehyde.

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Human behavioural science: Perception and psychophysics

PSYCHOPHYSICAL QUANTIFICATION OF PAINLESSNESS IN A COHORT OF 'TOUGH MUMS'

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Background and aims

Patients with congenital insensitivity to pain (CIP) are extremely rare. The diagnosis is based on a history of painless injuries in the absence of other neurological abnormalities. Conventional sensory testing is limited by ceiling effects that occur commonly because of safety limits imposed during stimulus delivery. Our aim is to develop a safe experimental protocol to assist in the clinical screening for CIP.

Methods

The protocol, which includes cold-water immersion of the hand and forearm cuff pressure algometry, is being developed in a cohort of females (Tough Mums) who are identified as 'pain resilient' on the basis that they did not request or receive analgesics during a recent parturition. Questionnaires and cognitive testing (CANTAB) are employed to better characterise the bases of pain resilience in the study cohort. Exposure times to elicit pain threshold and voluntary cessation of stimuli (tolerance) are recorded. Subjective ratings of the experimental stimuli are obtained after each procedure.

Results

To date, questionnaires have revealed significantly lower levels of fear of pain, and sensitivity to illness and injury, in the Tough Mums compared to normative data. Data from psychophysical testing are being acquired.

Conclusions

Preliminary data suggest that several psychological characteristics of the Tough Mum cohort differ from normative values. The relationship between these psychological traits and tolerance of experimentally induced pain remain under investigation.

INFLUENCE OF ILLUSORY KINESTHESIA BY VIBRATORY TENDON STIMULATION ON PAIN THRESHOLD CONSIDERATION OF THE TRAIT ANXIETY

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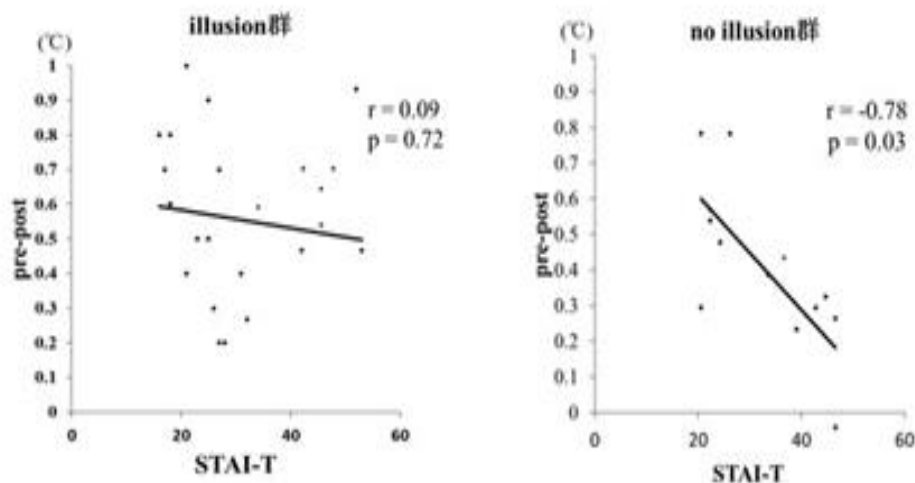
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Background and aims: It is not clear as to whether illusory kinesthesia or sensory input bring about pain amelioration. We compared the change in pain threshold between an “illusory group” and a “non-illusory group” and analyzed the relationship between trait anxiety, illusory kinesthesia, and the change in pain threshold.

Methods: Participants were 35 individuals who were categorized into 2 groups (illusory and non-illusory) by vibratory tendon stimulation. Pain threshold and trait anxiety were measured pre-task, and pain threshold and illusory intensity were measured post-task. Pain threshold was compared between the 2 groups using a two-way ANOVA. For *post-hoc* comparisons, Tukey's HSD test was used for multiple comparisons. Spearman's correlation coefficient was used to investigate the relationship between the amount of change in pain threshold and the State Trait Anxiety Inventory-Trait (STAI-T).

Results: The pain threshold was significantly higher post-task than pre-task in both groups ($p < 0.05$). However, there were no significant differences between groups ($p > 0.05$). STAI-T scores had a negative correlation with the pain threshold in the non-illusory group ($p < 0.05$, $r = -0.78$) but no significant correlation in the illusory group ($p = 0.72$, $r = 0.09$).

Conclusions Therefore, the present study showed that the pain had improved regardless of the level of trait anxiety in the illusory group and had not increased in the non-illusory group. In other words, the pain threshold in individuals with high trait anxiety in the non-illusory group increased to a smaller extent.



THE HOT WATER BATH AS A RELIABLE AND VERSATILE METHOD OF PAIN INDUCTION FOR EXPERIMENTAL RESEARCH

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Background and aims: Unreliable methods can compromise experimental results, e.g. by obscuring a treatment's effect through ceiling/floor effects. A hot water bath is an affordable, well-accepted and highly versatile method of pain induction (e.g. permitting spatial summation or counter-irritation paradigms). We present pilot data about its retest reliability in a paradigm aimed at detecting expectancy effects on pain. **Methods:** 11 participants were exposed to a sequence of five 60 second immersion trials of the dominant hand in 47°C hot water. Each trial was followed by 30 seconds pause. 35 minutes after the first sequence, the test was repeated. Pain ratings were collected continuously through a touch-screen interface with a sampling rate of 40 frames/second. **Results:** From sequence 1 to 2, retest reliability of mean pain ratings reached $\rho=.82$ (intraclass correlation), maximum pain ratings reached $\rho=.84$. A mean effect of trial was found such that pain increased with each consecutive trial ($p<.001$, $\eta^2=.55$) (see Figure 1 for this and following results). Corresponding to intraclass correlation, ratings between sequences did not differ ($p=.12$). A trial*sequence effect ($p=.034$, $\eta^2=.25$) is founded in lower ratings in trials 1 and 2 of sequence 2. **Conclusion:** The presented protocol has high retest reliability after 35 minutes' intermission. Using trials 3 to 5 only is being considered. The protocol is suitable to detect between-group changes in quick-acting pharmaceuticals, or psychological experiments investigating e.g. emotional or expectancy effects.

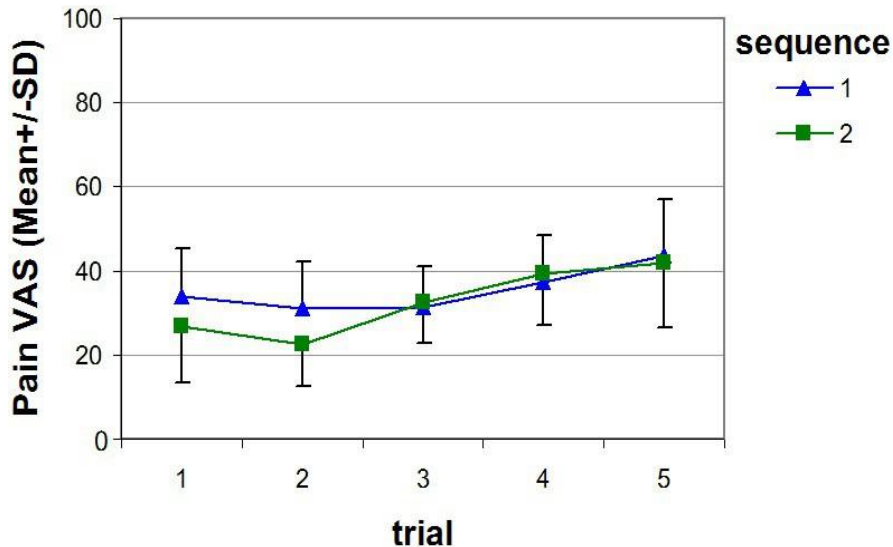


Figure 1 Pain ratings. All mean contrasts significant except trials 1vs2, 1vs3, 3vs4.

ANODAL HIGH-DEFINITION TRANSCRANIAL DIRECT CURRENT STIMULATION (HD-TDCS) OF THE CEREBELLUM MODULATES PRESSURE PAIN THRESHOLDS

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Background and aims: Magnetic Resonance Imaging of healthy participants during experimental pain tasks reliably show cerebellar activation. Patients with cerebellar damage have demonstrable deficits in pain processing. Taken together, the cerebellum is increasingly thought to have a role in human pain processing. A new non-invasive neurostimulation technique, high-definition transcranial current stimulation (HD-tDCS) may be particularly suited for cerebellar stimulation. Here the effectiveness of HD-tDCS of the cerebellum for the modulation of pain pressure threshold is examined.

Methods: 11 healthy male participants completed this repeated measures study. Quantitative sensory testing (QST) of pressure pain thresholds from the thumbnail bed was conducted through an algometer controlled through the Medoc Pathway software. QST was performed pre and post neurostimulation. Neurostimulation was Sham HD-tDCS or Cathode HD-tDCS and Anode HD-tDCS for 20min to the right cerebellum, with active stimulation set to 2 mA.

Results: Anodal stimulation increased pressure pain threshold in the left and right hand by 13.77% (290.35 KPa, $\delta = 49.25$) and 20.28% (307.47 KPa, $\delta = 77.12$) respectively in comparison to sham stimulation, and this was strongly significant $F(1,10) = 29.184$, $p = <0.0001$, $\eta^2_p = 0.745$). Sham and cathodal stimulation showed no significant effects.

Conclusions: High-definition transcranial direct current stimulation effectively modulates pressure pain thresholds. The effectiveness of this stimulation could be due to activation of descending inhibitory pain pathways as well as through its connectivity with many other brain areas involved in pain processing.

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Human behavioural science: Perception and psychophysics

HEAT-, COLD- AND MECHANICAL PAIN THRESHOLDS UNDER TOPICAL HIGHDOSE CAPSAICIN

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Background and aims

The application of topical high dose capsaicin (8%) provokes a distinct heat pain which can be prevented by cooling the application area below skin temperature¹. In this study we determined heat pain thresholds (HPT), cold pain thresholds (CPT) and mechanical pain thresholds (MPT) during and 2 weeks after exposure to topical Capsaicin 8%. The aim was to find out the temperature range in which application is not painful, and to verify a long term effect of capsaicin on the different pain thresholds.

Methods

In a randomised, double blind, placebo-controlled, cross-over study 20 healthy volunteers were treated over 60 min by a Capsaicin 8%-Patch (Qutenza®) or a Placebo-Patch of 9 cm² on the distal left or right forearm. After that the cross over patch was applied to the other forearm again for 60 min. During the application procedure the temperature thresholds were determined every 15 minutes by a TSA-II-Thermode kept above the patch, and by a temperature probe fixated between the skin and the patch. Immediately after removing the patch a Spike was pressed slowly against the treated skin areal to determine the MPT.

Results

In the area exposed to Capsaicin HPT decreased significantly, whereas all the other thresholds did not. Mean CPT was 13.2°C.

Conclusions

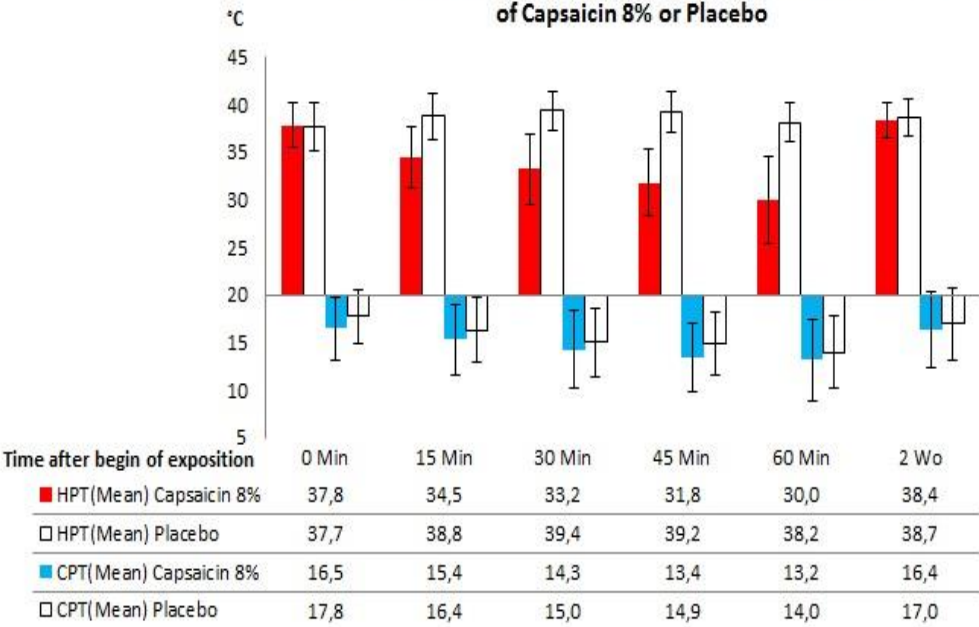
Capsaicin reduces the temperature necessary to activate TRPV1 from 43°C ² to 30°C. To prevent the resulting pain skin temperature must be kept < 30°C but >13.2°C.

¹Knolle E et al.Pain 2013.

²CaterinaMJ et al. Nature 1997.

Time after Begin of exposition	HPT (°C) Capsaicin	HPT (°C) Placebo	CPT (°C) Capsaicin	CPT (°C) Placebo	MPT (g) Capsaicin	MPT (g) Placebo
0 Min	37,8±2,3	37,7±2,6	16,5±3,3	17,8±2,7		
60 Min	30,0±4,5	38,2±2,1	13,2±4,2	14,0±3,8	101,2±56,0	107,9±51,9
2 Weeks	38,4±1,8	38,7±1,9	16,4±4,0	17,0±3,8	122,1±48,3	115,8±48,4

Heat- and Coldpain thresholds (HPT, CPT) during application
of Capsaicin 8% or Placebo



EFIC5-0561

Human behavioural science: Perception and psychophysics

INVESTIGATION OF PSYCHOSOMATIC SYMPTOMS AFTER CHEMICAL EXPLOSION AND AIRPLANE CRASH IN KAOSHIUNG CITY

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Backgrounds and aims:

It was noted that numbers of psychiatric OPD patients increasing after the disasters of chemical explosion and airplane crash in Kaohsiung city, Taiwan. As the results, this study aimed to gain more understanding about the pictures of the mental health changing in community, especially focusing on the community population whom were not impacted directly by the disaster.

Methods:

This study invited 60 citizens of Kaohsiung city, who must be over 18 years old and the ones suffering from direct impact of disasters were excluded. The operative definition of 'direct impact of disaster' was participants suffering from the chemical explosion or airplane crash and the events caused one's body injury or material loss in either self or family. Every participant was required to complete a checklist of psychosomatic symptoms, which including insomnia, headache, anxious mood and so on.

Results:

There were 38 female and 22 male participants in this study. About 6.6 percent of participants had psychiatry OPD records. Among the psychosomatic symptoms, up to 99 percent of participants reported poor memory, 79 percent of participants reported being irritable, 78 percent of them reported being hysterical and feelings of insecure, 66 percent of them reported of being indecisive and 58 percent reported increasing the check behaviors repeatedly.

Conclusions:

It is interested that most trauma- related studies were focused on the victims who suffering directly from disaster, however the results of this study indicated that mental health issue would be also concerned for the non-direct impact population of community.

**DISCREPANCIES BETWEEN PATIENTS AND HEALTH CARE PROFESSIONALS
PERCEPTIONS ABOUT POSTOPERATIVE PAIN MANAGEMENT**

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Background and aims

Postoperative pain is a complex phenomenon that includes physical, psychological, social, cultural and environmental factors that interrelate and affect how pain is perceived, managed and evaluated. This study aims were to identify and explore the degree of concordance between patient and health care professionals perceptions about postoperative pain management.

Methods

The research method was quantitative, statistical analysis was made of data from the assessments, opinions and attitudes of participants and their generation of numerical values provided by the questionnaires. Target groups were MD (n=20), nurses (n=40) and postoperative patients (n=120) of the surgical wards at the Regional Hospital of Prizren.

Results

The findings reported in this study concerning discrepancies in ratings of post-operative pain between patients and health care professionals and inconsistent use of interventions in controlling post-operative pain clearly indicate that health care professionals underestimate both the frequency and the intensity of patients' post-operative pain experience. According to documentations 72% of medical doctors still prescribe analgesics "as required", this indicate to nurses in underestimation of patients pain reports, and only when patients has pain nurse give prescribed analgesics.

Conclusions

Lack of preparation pre-surgically for patients on how to manage their pain, the failure to administer analgesia promptly on the first post-operative day and the significant failures to detect patients in pain, all suggest a low priority is being giving to postoperative pain control.

It is needed to develop and implement the educational programs within the stationary health institutions with emphasis on effective postoperative pain management.

HOW CAN AN OBSERVER'S EMPATHY INFLUENCE MY PAIN? A WINDOW INTO BRAIN RESPONSES DURING EMPATHIC AND NON-EMPATHIC FEEDBACK FROM OTHERS.

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Empathy has been widely studied as a physiological phenomenon, and influential studies in functional imaging (fMRI) have shown the neural mechanism of empathy for pain. It's intuitively acceptable that other people can have a significant impact on one's pain. However, the mirror situation of how I receive empathic feedback from others and how I modulate the pain I am confronted to is still unexplored.

To this aim, in a preceding psychophysical study we built experimental scenarios in which volunteers could hear comments from the observers on their ongoing pain made of hot stimulations delivered on the left hand via a heat thermode. Professional actors were recorded while playing roles of experimenters observing a subject. Here we studied whether empathy or non-empathy of an observer can modulate subjective and autonomic nervous system responses to pain. The experiment was conducted in 30 volunteers.

We found that pain intensity was significantly attenuated (-12%) during empathic as compared to non-empathic conditions, and this was also significant individually in 16/26 (61,5%) volunteers. RR intervals significantly decreased in reaction to nociceptive stimulation but not differ between conditions.

This experiment has been translated in fMRI, and acquisition of data is in progress. The goal of this poster is to present the first fMRI data will explain how (and where) the brain modulates its inputs on nociceptive system with regard to the findings obtained in behavioral study.

REDUCED PAIN INHIBITION CAPABILITIES AMONG WOMEN WITH BORDERLINE PERSONALITY DISORDER

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Background and aims: Ample evidence suggests that individuals with borderline personality disorder (BPD) exhibit hyposensitivity to pain, as manifested by increased pain thresholds and/or decreased pain ratings. Since the underlying mechanism of this hyposensitivity is unknown, we tested whether 1) it is pain-specific or exists also in innocuous sensations, and 2) it is associated with reduced pain inhibition.

Methods: Participants were 22 women with BPD and 33 age-matched healthy controls. Testing included the measurement of warmth sensation (WST) and heat-pain (HPT) thresholds, pain habituation and conditioned pain modulation (CPM).

Results: Women with BPD had higher WST and HPT compared with controls. In addition, CPM magnitude was increased among women with BPD compared to controls, and the time trend (but not magnitude) of pain habituation was slightly more intensified. However, the thresholds did not correlate with the magnitude of pain habituation or CPM and none correlated with BPD symptomatology.

Conclusions: The results suggest that women with BPD exhibit generalized hyposensitivity to both innocuous and noxious stimuli and more efficient pain modulation capabilities than healthy women. The lack of correlation between the hyposensitivity and pain modulation magnitude may suggest that these qualities operate independently from one another and/or that other factors mediate their mutual existence.

EFIC5-0771

Human behavioural science: Perception and psychophysics

PERIPERSONAL SPACE MODULATED PAIN HABITUATION: EFFECT OF ARM POSITION RELATIVE TO THE BODY.

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Background and Aims: Pain is a complex subjective experience that is shaped by numerous factors. For example, the ability to localize nociceptive stimuli is essential to respond appropriately to potential physical threats. However, the mechanisms supporting such spatial aspects of pain habituation remain poorly understood. Hence, the current study examines how limb position relative to the body affects thermal pain adaptation.

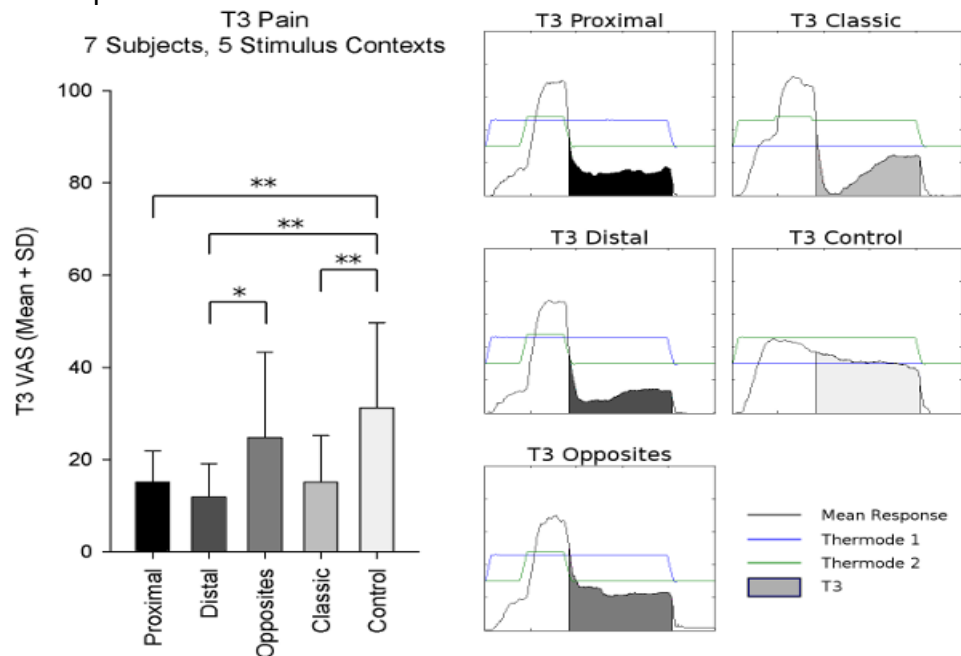
Method: On each trial a heat stimulus (48 °C) was delivered to 20 healthy participants' forearm. Two stimulus factors were varied: For Arm-Distance factor(1), participants rested their stimulated arm either near to (about 20 cm, Near-condition) or far from their body (about 50 cm, Far-condition). For Arm-Rotation factor(2), the arm was either rotated internally and rested in front of the body or rotated externally and rested away from the body. The 2 factors were combined into 4 conditions with 6 trials. For each trial, pain rating was collected. The effect of the two factors on changes in pain intensity across the 6 consecutive trials was analysed.

Results: Analysis of pain ratings revealed that arm distance significantly affect subjective pain intensity and habituation: Participants reported significantly higher pain intensity and showed habituation in lesser extent in Near-condition as compared to the Far-condition. In contrast, arm rotation had no any effect on pain perception.

Conclusion: The present results suggest that habituation to noxious stimuli on limbs positioned inside the peripersonal space might be reduced that support the existence of a defensive peripersonal space, representing a safety margin for survival.

CENTRAL MECHANISMS ARE SUFFICIENT TO ACHIEVE TEMPORAL FILTERING OF NOCICEPTIVE INFORMATION IN OFFSET ANALGESIA*B. Petre¹, L. Huang¹, A.V. Apkarian¹*¹*Physiology, Northwestern University, Chicago, USA*

Reduction from a more to a less noxious stimulus intensity produces a disproportionate decrease in perceived pain relative to an isolated control stimulus of the lower intensity. Although the relationship between the central nervous system and this offset analgesia has come under investigation using brain imaging, whether offset analgesia is primarily mediated by central rather than peripheral mechanisms has not been established. Here we investigate this question in healthy volunteers using thermal stimulation while recording continuous pain ratings. We constructed a composite stimulus using one Peltier thermode to deliver a constant 'background' pain stimulus while a separate thermode coincidentally delivered a shorter but more intense stimulus at a distinct location. Three spatial configurations were investigated all delivering stimulation to the ventral forearm, either proximally or distally from one another on the same forearm or with thermodes on opposite forearms. We demonstrate a decrease in background pain levels during the stimulation period (T3) following offset of a more intense ipsilateral but not contralateral stimulus (rm-ANOVA $F = 6.93$, $p < 0.001$, post-hoc Tukey-test proximal and distal vs. control $p < 0.01$, distal vs. opposites: $p = 0.048$). This decrease is comparable in magnitude to that observed during a single thermode classic offset analgesia stimulation (classic vs. control $p = 0.009$). This demonstrates central mechanisms are sufficient to achieve temporal filtering of nociceptive information.



CONDITIONED PAIN MODULATION: COMPARISON BETWEEN THREE CONDITIONING STIMULUS

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Aim of Investigation: Conditioned pain modulation (CPM) has been increasingly used in experimental and clinical settings. However, some technical issues have not been explored, which could impact cost, feasibility and compliance to current technical recommendations. The aim of the present study was to compare three different methods of performing conditioned stimulus (CS) to elicit CPM in healthy subjects (HS).

Methods: Thirty HS (not on medication at the time of testing or during the previous month) underwent the same test stimulus (TS): suprathreshold heat pain with a thermode (30x30, Medoc) for five seconds over the anterior right leg. Three CS we performed at the left hand in three different experimental sessions executed one week apart in a cross-over design. All CS were applied until a VAS>70/100mm was triggered and this CS intensity was used in the CPM protocol. CS were: i. cuff-ischemic pain over the wrist (CI), ii. hand immersion in cold water (HI) up to the wrist; iii. infrathreshold cold pain with a thermode (IT) over the thenar eminence. Unpleasantness was rated in a 100mm scale.

Results:

All CS methods elicited similar unpleasantness and pain intensity. All three CS methods induced CPM. However, CPM was more intense in the HI session (-42.6 ± 22.6 ; $p=0.011$); when compared to CI (-51.4 ± 19.3); and IT (-53.8 ± 26.0) methods.

Conclusion: Different magnitudes of CPM can be elicited in the same individuals according to the type of CS used, even when controlling for the same body region, stimulus unpleasantness and pain intensity. This may have a practical role in the choice of the best CPM method in clinical practice.

EFIC5-0096

Basic Science (Anatomy/physiology/pharmacology/behaviour): Imaging – humans

MRI-BASED NEUROIMAGING EVIDENCE OF THE EFFECT OF THE SEPTUM ON ACUTE AND CHRONIC NOCICEPTION IN HUMANS

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Background and aims:

The hippocampus participates in nociception and processes pain-related information, and the septum has been shown to influence underlying nociception in electrophysiological studies. Nevertheless, there exist certain limitations in past research on nociception involving the septum and the hippocampus, such as animal-based experiments, invasive manipulations and emphasis on acute pain. The primary objective of this research-in-progress is to explore non-invasively the functional and anatomical cortical connectivity between the septum and the hippocampus in order to progress the understanding of both acute and chronic nociception in humans.

Methods:

This research-in-progress develops two MRI-based neuroimaging experiments to investigate both nociception, respectively. One fMRI experiment for acute nociception captures the functional connectivity between BOLD signals in the septum and the hippocampus, with or without presence of acute nociceptive stimuli. The other DTI fiber tracking experiment compares chronic pain patients' and healthy samples' microstructural connections between the septum and the hippocampus.

Results:

This research-in-progress will apply dynamic causal modeling (DCM) to estimate the causal coupling between the septum and the hippocampus based on fMRI BOLD data measured in the experiment of acute nociception. DTI indices and architecture of fiber tracts between the two regions will be assessed to reveal distinctions between patients suffering chronic pain and healthy samples.

Conclusions:

The research is still in progress, and according to the outcomes of the ongoing experiments, the conclusions will be further developed in future presentation.

NEURAL MECHANISM OF DYSESTHESIA PRODUCED BY SENSORIMOTOR INCONGRUENCE.

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Background and aims

Pathological pain and dysesthesia are caused by sensorimotor incongruence. However, it is still not clear whether the dysesthesia is caused by incongruences between motor intention and visual feedback or between proprioception and visual feedback. Furthermore, the neural mechanism of dysesthesia is uncertain. In the present study, we clarify the neural mechanism of dysesthesia using electroencephalogram.

Methods

Eight healthy subjects participated in this study. Participants were instructed to put the left limb, where it was reflected in the mirror aligned with the sagittal plane, and put the right limb behind the mirror. They were told to perform the following flex/extension exercises with their elbows: moving elbows simultaneously (congruence condition), moving elbows unsymmetrically (incongruence condition), moving only the left elbow simultaneously intending to move the right elbow (intention condition), and moving only the left elbow but the right one was moved by the experimenter (proprioception condition). In all conditions, they were told to watch the hand reflected in the mirror. We recorded the EEG activity and evaluated the strength of dysesthesia in every condition.

Results

In situations with peculiar dysesthesia, there were significant and positive correlations between incongruence and intention condition ($r=0.78$, $p=0.02$), and between incongruence and proprioception condition ($r=0.94$, $p=0.0004$). From results of EEG, both alpha power of posterior cingulate cortex in incongruence condition and beta power of insula in proprioception condition were significantly lower than congruence condition.

Conclusion

We clarified the neural mechanism of dysesthesia and confirmed its cause as the incongruence between proprioception and visual feedback.

EFIC5-0247

Basic Science (Anatomy/physiology/pharmacology/behaviour): Imaging – humans

"PAIN ENGRAMS": BEHAVIOURAL AND NEURAL CORRELATES OF NOCICEPTIVE WORKING MEMORY

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Aim of Investigation: Neuropsychological and clinical research suggests working memory (WM) function is impaired in chronic pain patients. Yet, information on mnemonic cortical representation of potentially noxious painful stimuli is currently lacking.

Methods: we recorded electroencephalography (EEG) in human volunteers during a modified delayed-match-to-sample task, which involved sustained maintenance of the task-relevant attributes of selective nociceptive laser stimuli (intensity and location) for subsequent cued-discrimination of either stimulus dimension, in two different memory-load conditions (i.e., two stimuli vs. three stimuli). In addition, we measured performance in a series of neuropsychological tests to be correlated with nociceptive WM.

Results: As expected, participants performed better in the lower load condition. Furthermore, time-frequency analysis of EEG responses revealed that this different performance was reflected in systematic modulations of oscillatory activity. Moreover, we found a covariation between oscillatory modulations and performance in neuropsychological memory tests, thus suggesting a potential clinical relevance of the electrophysiological responses.

Conclusions: In keeping with tactile WM research, our findings highlight the link between event related nociceptive oscillations and “pain engrams”, a result that can pave the way to investigation of memory of potentially noxious stimuli in conditions of clinical pain.

PRIOR ASSOCIATIONS OF PAIN WITH NEGATIVELY VALENCED PICTURES INCREASE SUBSEQUENT BOLD RESPONSE TO PAINFUL HEAT

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Background

We have previously shown (Wunsch et al., 2003) that pain intensity ratings can be modified by a non-conscious associative learning procedure based on the transfer of the valence of unconditioned stimuli (pleasant or aversive pictures) towards conditioned stimuli (painful thermal stimuli). In the present study we used functional magnetic resonance imaging (fMRI) to elucidate the underlying neural mechanisms of pain aversive conditioning.

Methods

Nineteen healthy controls were scanned before, during and after aversive conditioning. Using a counterbalanced within-subject design, participants were subjected to an aversive conditioning (painful CO₂ laser stimuli associated with aversive pictures) on one foot and to a neutral conditioning (painful CO₂ laser stimuli associated with neutral pictures) on the other foot. We compared fMRI BOLD responses to laser stimulation before and after conditioning.

Results

VAS scores showed that laser stimuli were judged more intense after aversive conditioning. Post-fMRI questionnaires confirmed that participants were unaware of the conditioning procedure. The fMRI analysis (whole brain RFX, q(FDR)<0.05) revealed that the thalamus, SI, SII, anterior insula, cingulate cortex and limbic system were more activated after the aversive compared to the neutral condition. A number of temporo-occipital areas that were not activated prior to conditionings responded to laser stimuli post-conditioning.

Conclusions

Association of painful stimuli with aversive pictures modifies subsequent perception of painful stimuli and their neural processing. Conditioning-induced increases in BOLD responses were most apparent in somatosensory areas. The aversive conditioning might be mediated by the limbic system that is implicated in associative learning, and the visual cortex.

THE INTERRUPTIVE FUNCTION OF TRIGEMINAL COMPARED TO PERIPHERAL PAIN ON VISUAL ENCODING - AN FMRI STUDY

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Pain captures attention and interferes with ongoing cognitive processes, e.g. learning and memory. Various top-down and bottom-up factors modulate this interruptive function of pain. Pain in the trigeminal system and near the face plays a unique role in pain perception and processing. Based on the significance of trigeminal pain we hypothesized nociceptive trigeminal stimulation to have a greater negative impact on visual processing and memory encoding compared to nociceptive stimulation of the extremities.

Healthy subjects (N=23) performed a visual categorization task while receiving concomitant painful electrical stimulation on the left hand or forehead, respectively. Subsequently, all subjects performed a surprise recognition task, in which they indicated their memory confidence for previously presented pictures and the same number of lures. Functional MRI data was acquired on a 3T scanner. Anxiety ratings and pain-related questionnaire data were collected as control variables.

Anxiety ratings were higher for trigeminal pain. Behavioral outcome measures (categorization accuracy, reaction time and recognition accuracy) did not differ between both stimulation sites. Although neural data analysis is still ongoing, preliminary results suggest stronger activation in areas related to memory-encoding (e.g. hippocampus) during trigeminal compared to peripheral painful stimulation.

These results suggest enhanced encoding-related activity for trigeminal compared to peripheral pain, which might be compensatory to maintain comparable behavior performance. Furthermore, enhanced neural activity during trigeminal pain might be mediated by anxiety. These findings promise new insights into the underlying mechanisms of the cognitive impairment of patients suffering from chronic facial pain and headache.

DOES HYPERVIGILANCE INFLUENCE THE CORTICAL PROCESSING OF EXPERIMENTALLY INDUCED PAIN?

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Background and Aim: Attention to pain is assumed to be related to perceived pain intensity. This study aimed to investigate the effect of hypervigilance on cortical processing of experimentally induced pain.

Methods: After written informed consent, 44 healthy pain-free subjects underwent a habituation protocol of 25 electrical stimuli (all 25% above pain threshold), while measuring EEG on 14 cortical locations. All subjects completed the Pain Vigilance Awareness Questionnaire (PVAQ). EEG data was offline filtered, segmented and baseline corrected. For the first 1000 ms post-stimulus, 20-ms Event-Related Fixed-Interval Areas (ERFIAs) were calculated. ERFIAs were used as dependent variables in multilevel regression models. The dichotomized (median-split) PVAQ score was the variable of primary interest. Covariates were age, gender, ocular activity, stimulus number, sensory threshold and pain threshold. This study was approved by the local ethical committee (NL40284.068.12).

Results: The study group consisted of 21 males and 23 females. The mean age was 37 years (SD 17.3). The mean PVAQ score was 26.1 (SD 14.9). In a broad post-stimulus range (480ms to 960ms) PVAQ was significantly positively related to ERFIAs for all 14 cortical locations (Figure 1). Figure 2 shows the grand average event-related potentials (ERPs) for high and low PVAQ of C3, based on the model estimates.

Conclusions: By using the ERFIA multilevel technique, a positive main relationship between hypervigilance and cortical processing of experimentally induced pain was demonstrated. Our observations may provide an impetus to further investigate the complex relationship between hypervigilance, cortical pain processing and perceived pain.

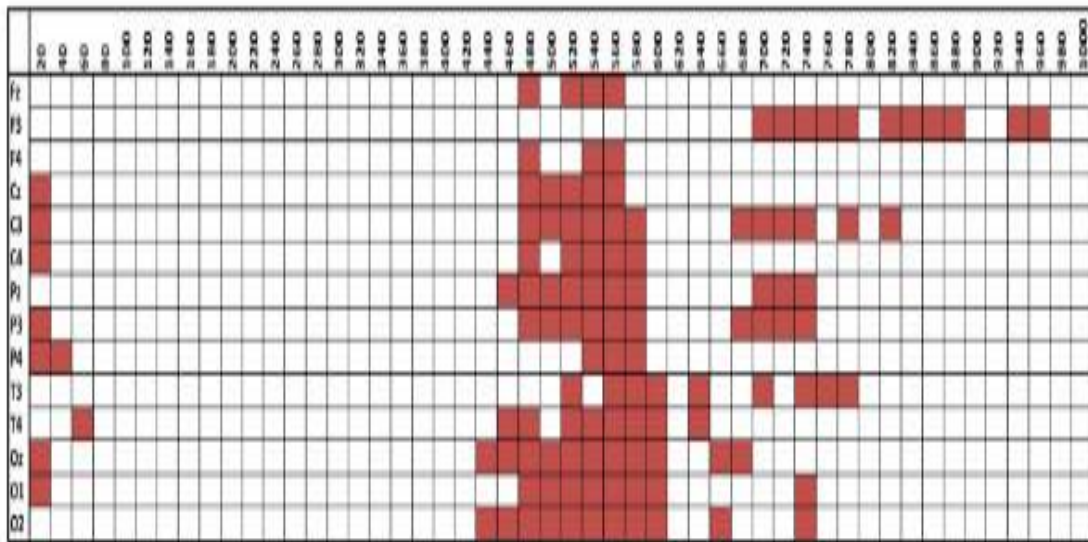
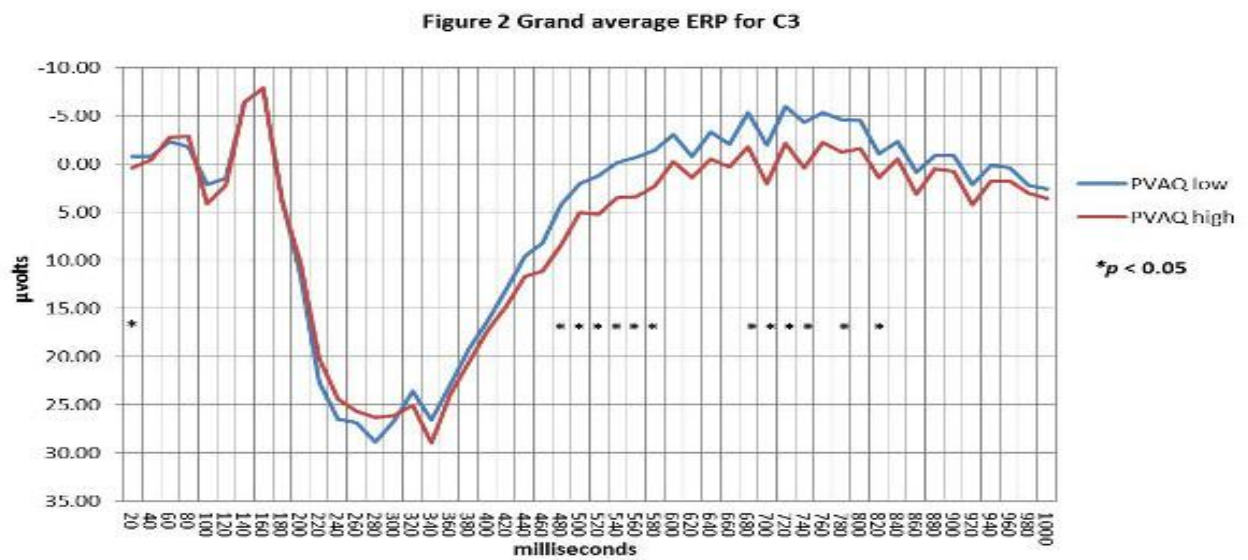


Figure 1. ERFA predictor blot for PVAQ. Columns: consecutive 20-ms ERFIAs; Rows: cranial locations. Cells with significant results are colored ($p < 0.05$).



NOCICEPTIVE LOCAL FIELD POTENTIALS RECORDED FROM THE HUMAN INSULA ARE NOT SPECIFIC FOR NOCICEPTION

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Introduction. The insula, especially its posterior portion, is believed to play a specific role in nociception, as its injury can alter pain perception, and because electrical stimulation and epileptic seizures in this region may generate pain-related experiences. Depth recordings in humans have also shown that nociceptive stimuli elicit robust insular local field potentials (LFPs), often considered pain-specific. Taking advantage of the high spatial resolution of direct intracerebral recordings, we assessed whether the insula exhibits pain-specific responses.

Methods. Five patients suffering from focal epilepsy were investigated using depth electrodes implanted in a total of 60 insular sites, in both the anterior and posterior insula. Patients received stimuli from four sensory modalities (thermonociceptive, vibrotactile, auditory, visual), and rated their intensity on a numerical scale ranging from 0 to 10.

Results. All patients described nociceptive stimuli as painful and pricking. However, the average ratings for stimulus intensity did not differ significantly across modalities. Thermonociceptive stimulation elicited LFPs at the same electrode contacts as non-nociceptive vibrotactile, auditory, and visual stimulation, in the posterior and anterior insula (Fig. 1). A blind source separation procedure based on a probabilistic independent component analysis showed that the LFPs elicited by nociceptive stimulation could be entirely explained by multimodal neural activity also contributing to the LFPs elicited by non-nociceptive stimulation.

Conclusion. Insular LFPs elicited by transient nociceptive stimuli reflect multimodal cortical activities unspecific for pain. These responses could reflect mechanisms of attentional re-orientation towards salient stimuli, including, but not limited to, painful stimuli.

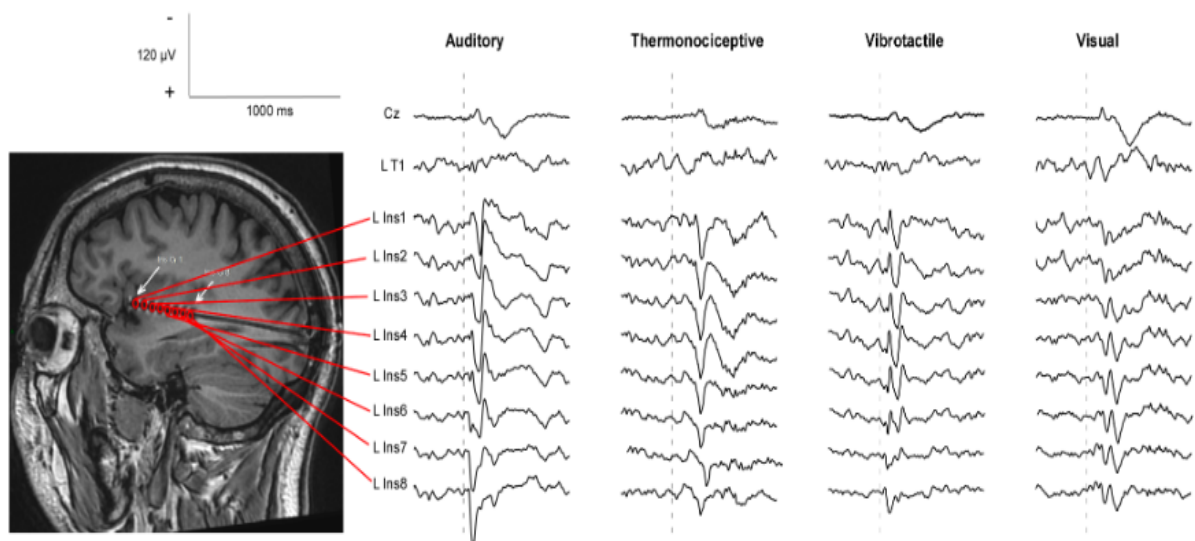


Fig.1 Local field potentials (LFPs) elicited by auditory, thermonociceptive, tactile, and visual stimuli in the anterior and posterior insula of a representative subject. All four types of stimuli elicit responses at the same electrode contacts, in both the anterior and posterior insula, appearing as large biphasic waves. Evoked potentials recorded from the scalp vertex (Cz) and from an intracerebral contact located in the left temporal lobe (LT1) are also shown for comparison.

PAIN-SPECIFIC GAMMA-BAND OSCILLATIONS RECORDED FROM THE HUMAN INSULA*G. Liberati¹, A. Klöcker¹, M.M. Safronova², S. Ferrão Santos², A. Mouraux¹*¹*Institute of Neuroscience, Université catholique de Louvain, Brussels, Belgium*²*St. Luc Hospital, Université catholique de Louvain, Brussels, Belgium*

Introduction. Pain is a multi-dimensional experience, including sensory, affective, and cognitive components. How these different dimensions integrate into a unified and coherent percept remains an open question. Gamma-band oscillations (GBOs, 30-100 Hz) could represent a possible mechanism to integrate low-level cortical processing of basic stimulus features with high-level cognitive processes. In the present study, we used direct intracerebral recordings performed in humans to investigate whether nociceptive stimulation elicits nociceptive-specific GBOs in the insula, a region considered to play a major role in pain perception.

Methods. Intracerebral activity was recorded from a total of 60 insular sites in 5 patients with deep multicontact electrodes, implanted for the presurgical evaluation of focal epilepsy. Patients received stimulation from four sensory modalities: thermonociceptive, tactile, auditory, and visual. Participants were instructed to rate the intensity of each stimulus on a numerical scale ranging from 0 to 10.

Results. There was no significant difference in ratings of intensity across modalities. In 4/5 patients, nociceptive stimuli consistently elicited a clear enhancement of GBO power at insular contacts, peaking 245 ms $\pm$ 12 ms after stimulus onset (Fig. 1), but not at other intracerebral contacts. Vibrotactile, auditory, and visual stimuli did not elicit such high frequency responses at any of the recorded contacts.

Conclusion. Nociceptive stimuli elicit consistent GBOs in the human insula. Because non-nociceptive stimuli do not elicit a similar response, these high frequency oscillations could reflect activity specific for nociception, possibly involved in the integration of stimulus-driven and top-down determinants of pain perception.

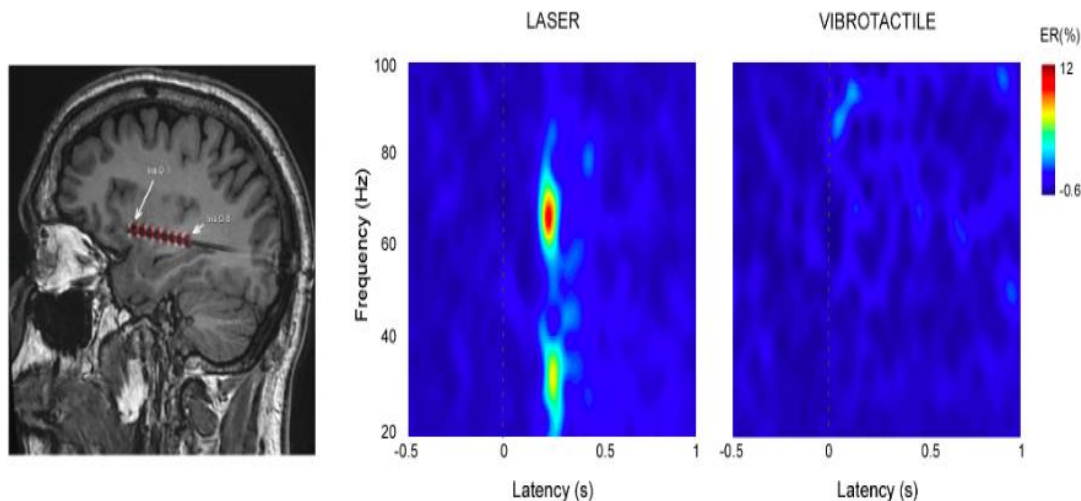


Fig. 1 Intracerebral electroencephalography data from one representative patient, showing a marked increase in the power of gamma-band oscillations (GBOs, 30-100 Hz) in the insula in response to nociceptive laser stimulation, but not in response to non-nociceptive vibrotactile stimulation. *Left:* Localization of 8 horizontal electrode contacts located in the anterior and posterior right insula. *Right:* Time-frequency representations of responses to laser and vibrotactile stimuli (magnitude expressed as percentage of change relative to baseline), averaged from all insular electrodes. Note that whereas nociceptive stimuli elicited an enhancement of GBOs at all anterior and posterior insular contacts, these activities were never found at any of the contacts in response to vibrotactile stimuli.

EXPECTATION INFLUENCES THE INTERRUPTIVE FUNCTION OF PAIN BY CHANGING NEURAL ACTIVITY AND CONNECTIVITY IN PAIN AND TASK-RELATED BRAIN AREAS.

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Pain captures attention and interferes with ongoing cognitive processes. Various factors influencing this “interruptive function of pain” have been identified (i.e., stimulus intensity, novelty or predictability). Expectations can influence pain perception, demonstrated for instance in placebo analgesia. Here we investigated the role of expectation on the interruptive function of pain in 42 healthy subjects. Verbal and written instructions were used to manipulate the subjects’ expectation of how pain would influence their task performance. A visual categorization task paired with concomitant painful thermal stimulation was used to assess cognitive functioning inside a 3T-fMRI scanner. We detected an interaction between stimulation and expectancy: Categorization accuracy decreased during painful stimulation in the negative expectancy group (N=21), while no difference was observed in the positive expectancy group (N=21). On the neural level we observed higher activity in the anterior cingulate cortex (ACC) and hippocampus during painful stimulation compared to no stimulation in the positive expectancy group. Furthermore, we detected a decrease in connectivity between ACC and fusiform gyrus during painful stimulation in the negative expectancy group, which was absent in the positive expectancy group. Taken together, we demonstrate that expectation modulates the interruptive function of pain, which was mediated by connectivity changes between pain processing and task processing areas. This study shows the possibility of modulating the interruptive function of pain at the behavioral and neural level by simple verbal instructions. This might have important implications for the treatment of chronic pain patients who often suffer from cognitive impairment due to pain.

AN FMRI BASED BIOMARKER FOR CHRONIC PAIN USING BRAIN NETWORK DECODING

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Background and aims: Clinical and translational research into chronic pain is limited significantly by the lack of a replicable biomarker. In the brain, there is an increasing body of evidence to suggest that pain manifests as a matrix or network based phenomenon. The development of graph theoretic techniques that can be used to interrogate brain networks, as well as powerful machine learning based classifiers for neuroimaging mean it is now possible to develop a brain network based biomarker for chronic pain

Methods: We conducted a multi-site functional magnetic resonance imaging experiment, examining brain networks in 41 patients with chronic lower back pain and 33 healthy controls. Functional covariance was calculated from 160 regions of interest based on the Dosenbach brain atlas. Sparse multinomial logistic regression was used to classify subjects as patients or controls, using a leave one out cross validation scheme. Graph theory measures were also used to characterize network differences.

Results: The biomarker had a diagnostic accuracy of 92%, with a sensitivity and specificity of 90% and 94% respectively. Graph theoretic analysis showed the chronic pain state was associated with disrupted network assortativity.

Conclusions: These results provide further evidence to show that the brain changes associated with chronic pain are network based. They also illustrate the development of an accurate functional biomarker of chronic pain, and open the door to the creation of translatable biomarkers for animal studies, using similar methodologies.

Funding: Engineering for Clinical Practice Grant; Wellcome Trust; National Institute for Information and Communications Technology.

EFIC5-0693

Basic Science (Anatomy/physiology/pharmacology/behaviour): Imaging – humans

A DOUBLE-CRUSH MECHANISM FOR TRIGEMINAL NEURALGIA IN PATIENTS WITH MULTIPLE SCLEROSIS

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Although established knowledge attributes multiple sclerosis-related trigeminal neuralgia (MS-related TN) to a trigeminal root entry zone demyelinating plaque, some studies raised the possibility that a neurovascular conflict might be associated. In this clinical and neuroimaging study we sought information on the role of the neurovascular conflict in MS-related TN.

We have screened 2428 consecutive patients with MS and we enrolled 28 patients with definite unilateral MS-related TN. In these patients we acquired dedicated 3-T MRI scans, identified pontine demyelinating plaques and, using highly specific diagnostic criteria, distinguished neurovascular conflict.

MRI scans showed a demyelinating plaque in the pontine trigeminal root entry zone in the affected side of most patients. The frequency of the neurovascular conflict and the association of the pontine demyelinating plaque and the neurovascular conflict were significantly higher in the affected side than in the normal side ($P=0.0001$).

Our study showing that in many patients suffering from MS-related TN a pontine demyelinating plaque and a neurovascular conflict coexist should prompt neurologists to seek possible neurovascular conflict in patients with MS-related TN. The observation of a symptomatic neurovascular conflict might be useful for planning surgical procedures, and imply the microvascular decompression procedure as first line surgical treatment.

EVIDENCE-BASED MODELLING OF NOCICEPTIVE LASER-EVOKED POTENTIALS

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To this day, source modelling of EEG responses to nociceptive stimulation has relied on interplay between physiological hypotheses and pure mathematical estimates. Over the last ten years, SEEG has disclosed a number of brain loci that are active during the first second after a nociceptive stimulus, partly confirmed by fMRI data. Here, we propose to refine the models of nociceptive stimulus processing by integrating current knowledge and advances in multi-modal brain imaging into the modelling of nociceptive EEG responses.

We recorded laser-evoked potentials to right hand stimulation in 15 healthy participants, using high-density EEG (128 electrodes) and modeled sources during the first second of brain activity in BESA. Initial dipolar source position was defined by converging data from SEEG and fMRI. Local adjustments were allowed using a bounding box.

Grand-average data was well explained by a 7-dipole model (goodness of fit ~94.5%). For 5 dipoles, source activity peaked around 200 ms after laser stimulation (right and left posterior insula-medial operculum, right frontal, left somatosensory-motor and anterior cingulate cortex). Left frontal dipole had a later, less defined peak, while the posterior cingulate dipole was maximally active around 400 ms. Overall, even though the model was constrained regarding dipole *position*, activity *time-course* was coherent with current knowledge. Notably, the most posterior dipole, located in regions traditionally linked to self-perception, was active late in the interval.

Even though this model remains probably incomplete and might be furthered by the use of higher electrode densities, it demonstrates the potential of integrating multi-modal neuro-imaging data.

COGNITIVE DECODING OF GRAY MATTER ALTERATIONS INDUCED BY CHRONIC PAIN

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Background and aims: Chronic pain conditions are frequently associated with regional gray matter (GM) alterations. Using a meta-analytic approach and network-based analysis we aimed to:

- compare the GM alteration maps against fMRI activation maps corresponding to various cognitive, perceptual and behavioral functions
- identify the nodes with high topological value (hubs) that may play a role in damage propagation

Methods: 55 VBM studies entered Anatomic Likelihood Estimation (ALE) analysis. The ALE maps of GM alteration (GM increase/decrease) were compared against the maps of fMRI meta-analysis available in Neurosynth using the decoder function. Equidistant spherical ROIs (d=10 mm) were placed in the peaks of GM alteration clusters and the resulting nodes entered subsequent damage network analysis.

Results: We identified a set of damaged nodes with high topological value (eg. bilateral insulae, anterior and posterior cingulate cortex) (Fig.1). We found a high overlap between GM decrease maps and fMRI meta-analytical maps of pain ($r=0.17$), reward ($r=0.16$), decision making ($r=0.13$) and response inhibition ($r=0.12$) and between GM increase maps and fMRI meta-analytical maps of reward ($r=0.19$), anticipation ($r=0.19$), pain ($r=0.15$) and learning ($r=0.14$) (Fig.2).

Conclusions: The results show that in chronic pain there are some high topological value nodes (hubs) that may play a pivotal role in damage (i.e. GM alteration) propagation. The overlap between GM structural changes and fMRI activation maps suggest a possible link between the observed GM alterations and the activity in brain circuits involved in functions like reward, anticipation and learning.

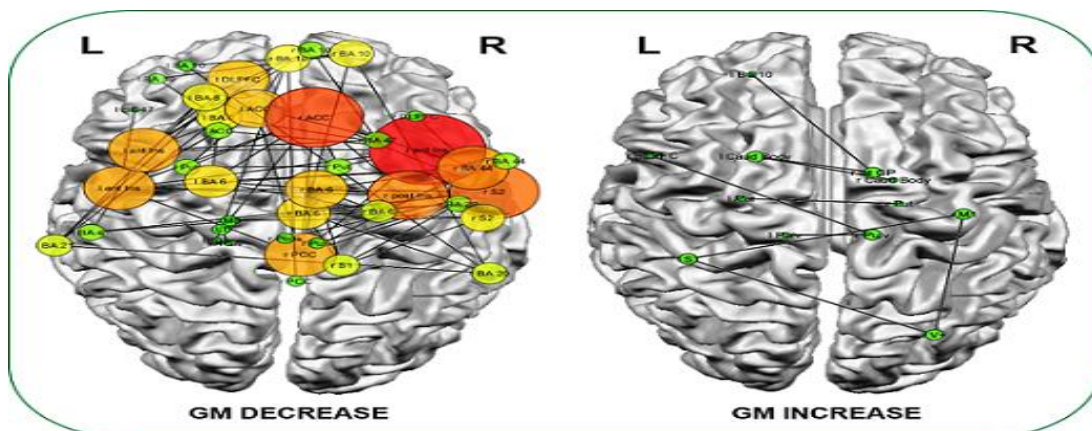


Fig.1

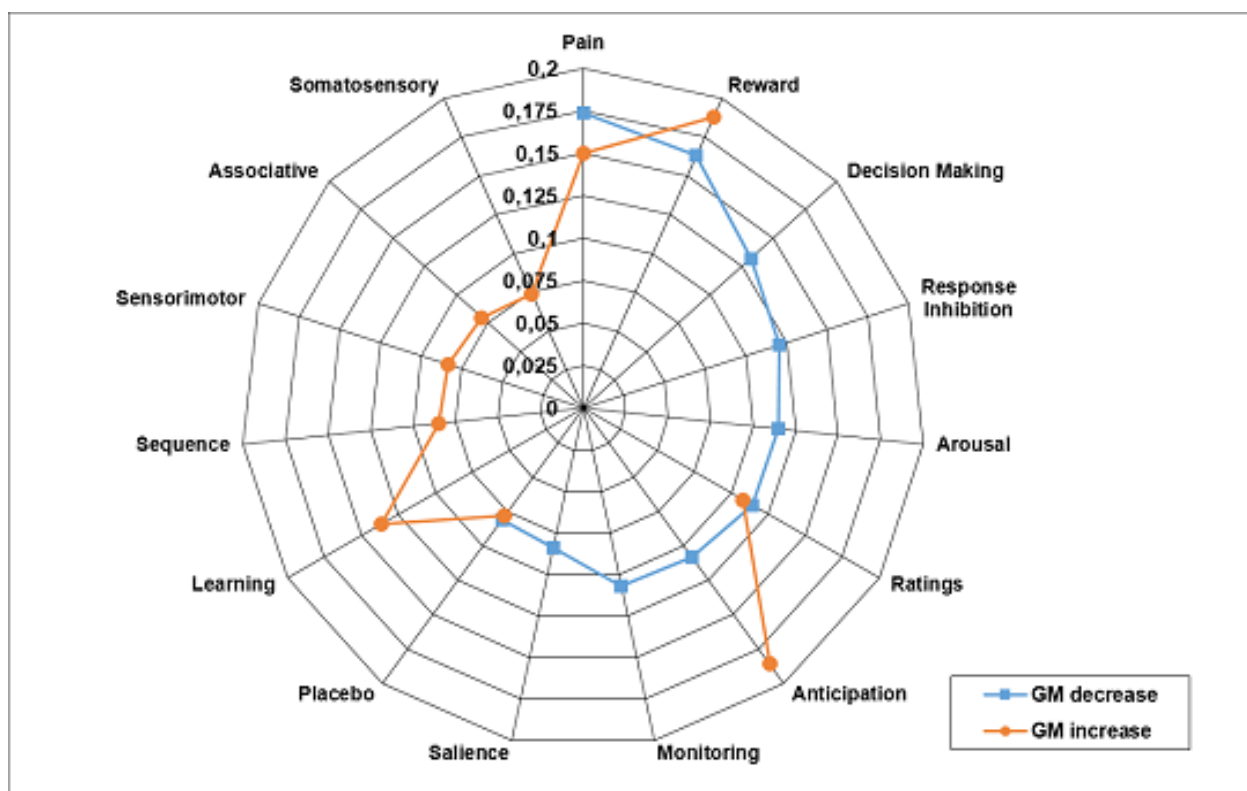


Fig.2

DIFFERENCES IN HEMODYNAMIC RESPONSE BETWEEN PAINFUL AND NON-PAINFUL MECHANOSENSORY STIMULATION OF THE LOWER BACK MEASURED BY FUNCTIONAL NEAR-INFRARED SPECTROSCOPY

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Background and aims

There is little evidence about cortical somatosensory processing of painful mechanosensory stimulations of the lower back, as painful electrical or heat stimulation were applied in previous studies. Functional near-infrared spectroscopy (fNIRS) was used in order to dissolve relative hemodynamic changes in oxy- and deoxyhemoglobin (HbO and Hb) in the primary somatosensory cortex (S1) during painful and non-painful mechanosensory stimulation of the lumbar spine.

Methods

Fifteen healthy subjects participated in this study. Four different stimulations (duration of 5s) were applied in randomized order. The stimuli included 'brushing' and force controlled non-painful posterior-to-anterior (PA) pressure onto lumbar vertebra L3 with 30 resp. 40 N. Finally, individual pain pressure threshold were determined and painful PA pressure was applied. A multi-channel continuous wave fNIRS imaging system with 8 LED sources and 8 detectors was used for recording of hemodynamic responses.

Results

Preliminary results yielded a significant main effect of condition and channel on single subjects level in both HbO and Hb calculated by repeated measures ANOVA ($p < 0.05$). Further, post-hoc paired t-tests revealed a significant difference in HbO as well as Hb between painful PA and 30N PA.

Conclusions

The present study revealed differential cortical processing in S1 of painful and non-painful mechanosensory stimulation of the lower back by investigating relative HbO and Hb changes. Based on these preliminary results, fNIRS may serve as a promising neuroscientific tool to investigate fast hemodynamic changes induced by pressure forces and kinesthetic stimulation of the lower back as well as neuroplastic changes in low back pain patients.

EFIC5-0011

Clinical pain states: Perioperative pain

COMPARISON OF LOCAL AND REGIONAL (VERTICAL INFRACLAVICULAR BLOCK) ANESTHESIA IN DIALYSIS ARTERIOVENOUS FISTULA OPERATIONS

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Objectives. There are no clinical trials comparing the influence of regional and local anesthesia on perioperative pain related to dialysis arteriovenous fistula operations.

Materials and methods. This was a prospective, randomized study. 103 patients with end stage renal disease who underwent dialysis arteriovenous fistula (AVF) operations on upper limb have been included. They were randomly divided in two groups: 54 patients in whom regional anesthesia was done (Group I) and 49 patients operated under local anesthesia (Group II). Influence of anesthesia type on perioperative pain have been evaluated and compared between groups.

Results and discussion. No anesthesia related complications have been detected. The mean time to sensory anesthesia in vertical infraclavicular block was 14.2 ± 2.3 mins. Insufficiency of sensory anesthesia has been detected in 3 cases (5.5%). Less number of patients with regional anesthesia required additional intraoperative analgesia as compared to the local anesthesia group ($p=0.0374$).

Time to postoperative pain initiation was higher in Group I then in Group II ($p=0.0400$). The need in postoperative pain killers was significantly less in regional as compared to local anesthesia group ($p=0.0323$). Duration of operation was significantly less in regional anesthesia as compared with local one ($p=0.0257$ and 0.001) and in some of them surgical tactic had been changed due to vasodilation.

Conclusion. Regional anesthesia provides significantly better perioperative analgesia as compared to local anesthesia for dialysis AVF operations. It decreases the operation time, need of additional pain killers and should be a method of choice for some forms of dialysis AVF operations.

EFIC5-0026

Clinical pain states: Perioperative pain

EFFECT OF LOW DOSE DEXAMETHASONE ON THE DURATION OF BRACHIAL PLEXUS BLOCK WITH BUPIVACAINE

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Background & aims

Several adjuvants have been used to prolong the duration of brachial plexus blocks with local anesthetics. One of them is dexamethasone in the dose of 8 mg or higher. We hypothesized that addition of low dose dexamethasone (4 mg) to bupivacaine would prolong the duration of analgesia similar to a higher dose. The objective of the study is to test this hypothesis.

Methods

This is a double-blind randomized controlled trial. After approval from the Ethics committee of the University of the West Indies, patients undergoing surgery under brachial plexus block were randomly allocated to receive a standard dose of 0.5% bupivacaine with and without dexamethasone (4 mg). Primary outcome measure was duration of analgesia. Secondary outcome included twenty-four hour morphine requirements.

Results

46 patients were studied with 24 patients in dexamethasone group and 22 patients in control group. Dexamethasone 4 mg significantly prolonged the duration of analgesia with bupivacaine (Mean $\pm$ SD: 19.8 $\pm$ 3.8) compared to control (Mean $\pm$ SD: 14.5 $\pm$ 4.2) hours; ($p < 0.001$). Twenty-four hour morphine requirements were not significantly different between the groups.

Conclusion

Low dose (4 mg) dexamethasone significantly prolonged the duration of analgesia when used with bupivacaine in supraclavicular brachial plexus block, similar to a higher dose, although it did not significantly decrease the overall opioid requirements for 24 hours postoperatively.

INDEPENDENT PREDICTORS FOR POSTOPERATIVE SEVERE PAIN IN GYNECOLOGICAL SURGICAL PATIENTS

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Background: To determine possible independent predictors for postoperative severe pain (POSP) in Post Anesthesia Care Unit (PACU) patients who underwent general anesthesia for lower abdominal, gynecological surgery.

Method: A prospective observational study was conducted at Tongji Hospital, China from January 2012 to July 2013. Total 1020 females undergoing gynecological surgery and transferred to PACU postoperatively were recruited in this study. To evaluate presence of POSP, we used Numerical Rating Scale (NRS) 0 "no pain at all" to 10 is unbearable pain on arrival in PACU. NRS ≥ 7 score was the break point for defining severe pain. Preoperative and intraoperative events and their roles on POSP were also analyzed.

Results: Data from 1020 patients were analyzed in the study. 184 [18%] patients experienced as NRS ≥ 7 . Multi-variate analysis found that independent predictors for POSP were cancer (OR [odds ratio] = 1.66 [1.026-2.698], $P=0.039$), Invasive surgery (OR=1.671 [1.026-2.640] $P=0.028$), longer operation duration (OR=1.774 [1.209-2.602] $P=0.003$) and NSAIDs before emergence (OR=3.64 [1.945-6.84] $P<0.001$). Patients with POSP experienced longer PACU stay (28.1 min versus 31.2 min, $P=0.006$), postoperative hospital length of stay (7.7 ± 5.1 day versus 9.8 ± 6.5 day, $P<0.001$), total hospital length of stay (12.6 ± 7.1 day versus 14.9 ± 9.2 day, $P<0.001$) and higher cost of health expenses.

Conclusion: We concluded that patients with cancer, invasive surgery, longer operation duration and NSAIDs uses before emergence were significantly independent predictors for POSP. It was effecting on PACU discharge, hospital length of stay and additional health expenses.

RISK FACTORS FOR ACUTE POSTOPERATIVE PAIN AFTER BREAST CANCER SURGERY

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Background and aims

Breast cancer is the most common cancer type among women in developed countries. Surgery is an essential part of the treatment. Persistent pain after breast cancer surgery is a major medical problem and it has been related to severe acute postoperative pain. Factors associating with the severity of acute postsurgical pain are therefore of interest. The main hypothesis of this study was that expectation of pain and high preoperative distress predict more severe postoperative pain after breast cancer surgery. In addition, we wanted to identify other risk factors for high pain intensity after breast cancer surgery.

Methods

The patient sample included 563 women. Background and psychological questionnaire data were collected the day before surgery. Pain intensity in the area to be operated was asked with a Numerical Rating Scale (NRS 0-10) the day before surgery and on the first seven postoperative days.

Results

Results of the multivariate analyses indicate that factors associating with acute clinically significant pain (NRS 4-10) after breast cancer surgery were: psychological distress, preoperative pain in the area of the operation and axillary clearance for the entire first week, and the patient's expectation of postoperative pain for the first three postoperative days.

Conclusions

Due to these results it is important to identify preoperatively the most distressed patients and patients that are expecting more intense postoperative pain. Simple methods for screening psychological distress before surgery are needed.

EVALUATING THE QUALITY OF INTRA-VENOUS REGIONAL ANESTHESIA FOLLOWING ADDING DEXAMETHASONE TO LIDOCAINE

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Background and aims : The quality of anesthesia in Intra-Venous Regional Anesthesia (IVRA) has been evaluated in many studies so far. This study was designed to evaluate the effects of adding Dexamethasone to Lidocaine on the quality of IVRA.

Methods: A double blind clinical trial was set up involving 50 hand surgery candidates, 20 to 55 years old, and with American Society of Anesthesiologists (ASA) class of I and II. Patients were randomly allocated into two groups of 25 cases and received either 3mg/kg of Lidocaine (control group) or 3mg/kg of Lidocaine plus 8mg of Dexamethasone (study group). The onset and recovery times from sensory and motor blocks, the starting time of tourniquet pain, the amount of narcotics needed during patients' recovery, and probable side effects were all compared between the two groups.

Results: No significant differences were detected concerning age, gender, length of surgery, and the mean time of starting of tourniquet pain between the two groups. The mean times of both sensory ($p=0.002$) and motor ($p=0.004$) blocks onset were significantly shorter in the study group. The mean time of recovery from sensory block was significantly longer in the study group ($p=0.01$). The average amount of narcotics needed during the recovery was significantly lower in the study group ($p=0.01$). No side effect was detected.

Conclusion: We conclude that adding Dexamethasone to Lidocaine can improve the quality of anesthesia in IVRA.

DOSE THE ADDITION OF NITROGLYCERINE OR DEXAMETHASONE AS AN ADJUVANT TO LIDOCAINE IMPROVE THE QUALITY OF INTRAVENOUS REGIONAL ANESTHESIA ?

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Background and aims : Various additives have been used with local anesthetic agents to improve block quality, reduce tourniquet pain, and prolong post-deflation analgesia. This study was designed to evaluate and compare the effects of adding TNG and Dexamethasone to Lidocaine on the quality of IVRA.

Methods: 90 Patients were randomized into three groups, lidocaine group (group L), lidocaine plus dexamethasone group (group LD), and lidocaine plus nitroglycerine group (group LN). The onset and recovery times from sensory and motor blocks, the starting time of tourniquet pain, the amount of narcotics needed during patients' recovery, and probable side effects were all compared between the three groups.

Results:

Sensory and motor block onset was earlier in second and third group. Sensory block recovery was longer in dexamethasone group. Onset of tourniquet pain ,sex, age and duration of operation were similar in all groups .Total analgesic consumption was lower in group dexamethasone.

Conclusions:

IVRA with lidocaine by adding dexamethasone or TNG provides more effective anesthesia for patients undergoing hand surgery when compared to the use of lidocaine alone.

EFIC5-0213

Clinical pain states: Perioperative pain

SYSTEMATIC REVIEW OF FACTORS PREDICTING PERSISTENT PAIN AFTER BREAST CANCER SURGERY

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Background and aims:

Persistent pain following breast cancer surgery is known to be a frequent problem. The identification of reliable predictive factors may allow preventive strategies targeted at the patients with highest risk. In 2011 a review had already addressed this subject, but since then many more studies have been published. We therefore conducted a systematic review of the literature on this subject up to January 2015.

Methods:

Systematic search of PUBMED, EMBASE and Cochrane CENTRAL using the search terms 'breast cancer' AND 'persistent pain' OR 'chronic postoperative pain'. Included were all pro- or retrospective trials. Excluded were reviews, studies aimed at a specific type of surgery, without pain as outcome, without risk factor analysis, or studies published as abstract only.

Results:

A total of 415 articles were identified, of which 43 were duplicates and 221 articles were discarded because title and abstract did not match inclusion criteria. The full text of 93 articles was screened, and 43 studies (16 prospective) with a total of 15274 patients retained.

The distribution of studies with positive, non-significant and negative results for risk factors which were analyzed in at least 3 studies are shown in figure 1. Results from the subgroup of prospective studies are shown in figure 2.

Conclusions:

Young age, axillary dissection, preoperative chronic pain, severe acute pain, anxiety, and depression were those risk factors identified in a majority of studies. However, when only prospective studies are included, the evidence is less clear.

Fig. 1: number of studies investigating each risk factor

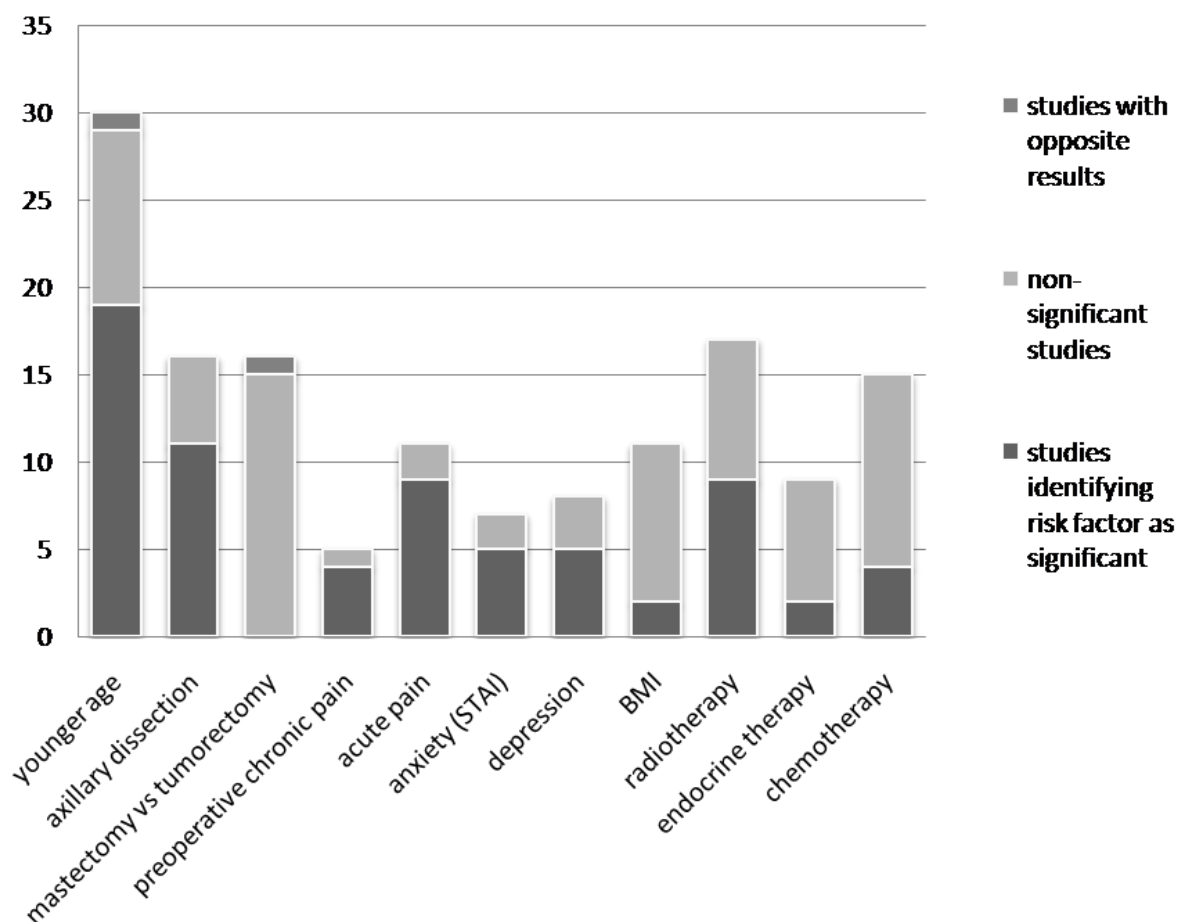
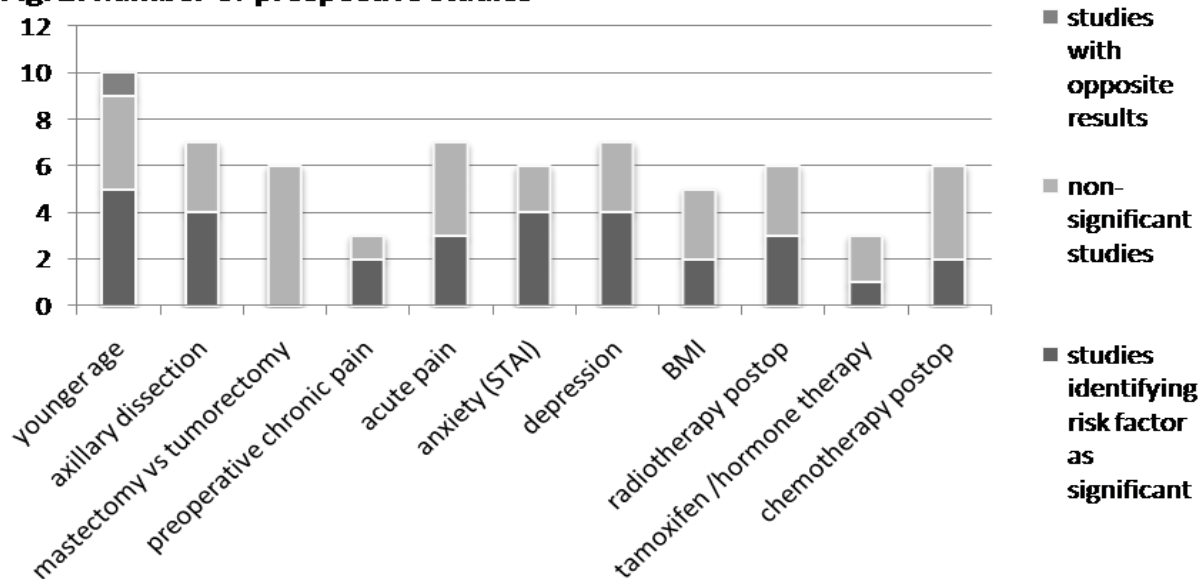


Fig. 2: number of prospective studies



PREDICTORS OF ACUTE POSTOPERATIVE PAIN AFTER HYSTERECTOMY FOR BENIGN CAUSES

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Psychological parameters have been proven to contribute significantly to the development of acute and chronic postoperative pain. Specifically, we found pain-related emotions and cognitions as well as attentional processing biases to be predictive of acute postoperative pain in funnel chest patients and cancer patients. These pain-specific predictors moreover seemed to outperform general predictors like e.g. depression. To investigate the variance of findings due to the surgical model, these predictor sets shall be re-tested in hysterectomy patients.

3 predictor groups were assessed in 79 middle-aged hysterectomy patients one day before surgery: attentional biases (pain-related, social threat and positive words in a dot-probe task), pain-related emotions and cognitions (pain catastrophizing, pain hypervigilance, and pain anxiety), and affective state variables (depression and somatization). Acute postoperative pain intensity ratings 2-3 days after surgery and the amount of analgesics during the first 48 hours after surgery were applied as outcome measures.

In multiple regression analyses, pain intensity was significantly explained by pain-related dot-probe words, pain anxiety and somatization ($R^2 = 0.154$). Yet, removing somatization from this model did not lead to a decrease of R^2 . Analgesic consumption could not be predicted significantly.

Psychological variables can predict acute postoperative pain, but cannot predict analgesic consumption. Furthermore, pain-specific predictors outperformed general predictors. Thus, hysterectomy patients at risk for high acute postoperative pain can also be described by pain-specific psychological variables ("risk profile"). This might be beneficial for improvement of pain management and prevention, because these variables can potentially be modified, e.g. through psychological prophylaxis programs.

PERIOPERATIVE RISK FACTORS ASSOCIATED WITH PERSISTENT POST-THORACOTOMY PAIN AT SIX MONTHS POSTOPERATIVELY

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Background and aims

Several risk factors have been associated with persistent postoperative pain. However, individual and joint contributions of risk factors in prediction of persistent post-thoracotomy pain at clinically important time points remain questionable and inconsistent.

Methods

We investigated in a randomised placebo-controlled trial of perioperative gabapentin treatment as add-on to standardised paracetamol, ibuprofen, opioid, and epidural analgesia in the prevention of persistent post-thoracotomy pain, associations of selected perioperative risk factors with persistent postoperative pain assessed according to the Brief Pain Inventory tool six months after standardised thoracotomy of patients with lung cancer. Risk factors included demographics, preoperative unrelated pain, anxiety, duration of surgery, thoracotomy incision length, duration and width of rib retraction, impression of cortex, rib fracture, costochondral dislocation, postoperative rest and cough pain, use of epidural analgesia, opioid consumption, and surgical complications.

Results

Sixty-seven of 104 included patients (64%) were available for six-month follow-up of persistent post-thoracotomy pain. A total of 48% of patients reported post-thoracotomy pain at six months. Of the selected perioperative risk factors, only pre-existing unrelated pain ($p=0.05$), anxiety ($p=0.01$), rest pain at postoperative day 2 ($p=0.02$) and pain with cough at day of surgery ($p=0.02$) and postoperative day 1 ($p=0.05$) emerged as significant predictors of development of persistent post-thoracotomy pain.

Conclusions

This study identified preoperative unrelated pain, anxiety, and immediate postoperative pain as risk factors of persistent pain six months after thoracotomy. The study highlights the incidence of persistent post-thoracotomy pain and contributes to our understanding of potentially preventable perioperative risk factors.

THE LEVEL OF NOCICEPTION IN VIDEO-ASSISTED THORACOSCOPIC SURGERY PATIENTS WITH AND WITHOUT EPIDURAL ANALGESIA

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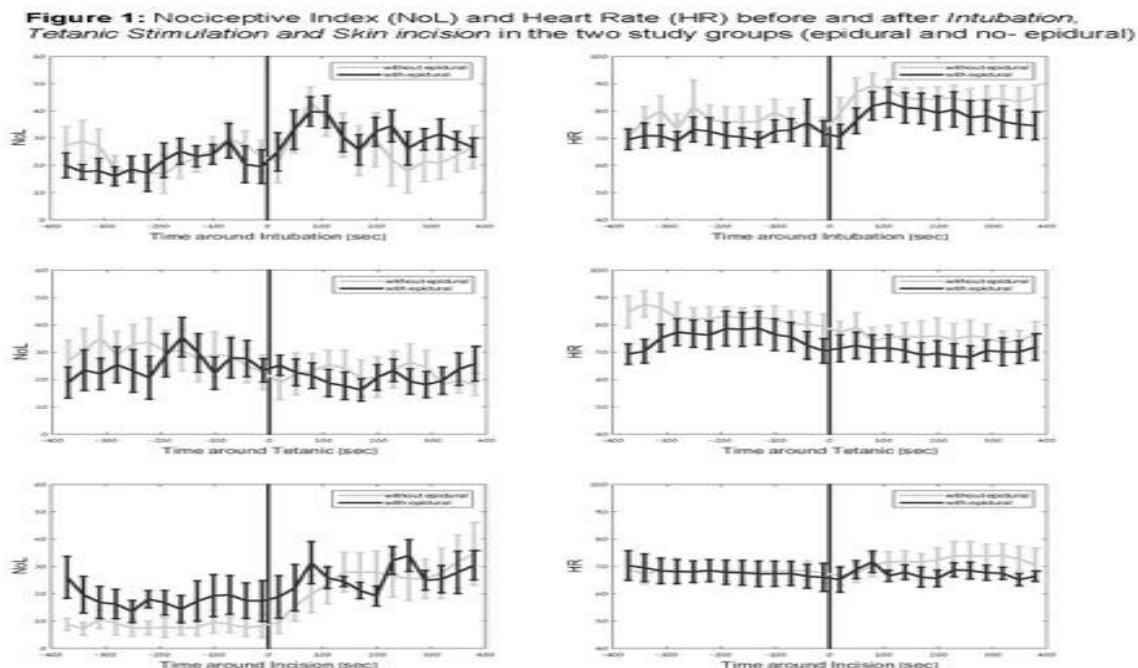
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Background and Aims: The aim of this study was to validate a novel nociception monitor (Medasense Biometrics Ltd, Israel) on patients under general anesthesia with and without epidural analgesia. The nociception level (NoL), presented as an index, is a composite of autonomic nervous system parameters assessed through a finger probe.

Methods: All subjects underwent video-assisted thoracoscopic surgery under general anesthesia. Preoperative thoracic epidural placement (TEP) was left to the discretion of the anesthesiologists. The nociceptive events included intubation, ulnar tetanic stimulation (60mA, 100 Hz, 20 seconds), and skin incision. The NoL and hemodynamic parameters were continuously measured from the start of anesthesia until 5 minutes after skin incision. If in situ, TEP was bolused with 5mL 2% lidocaine at least 5 minutes before skin incision. NoL values were compared using the student t-test 60 seconds before and 150 seconds after the three nociceptive events.

Results: 17 out of 25 (68%) consented subjects were analyzed, 8 (47%) of which received a TEP. 8 subjects (32%) were excluded due to technical issues. The mean $\pm$ SD NoL values for both groups combined before and after intubation, tetanic stimulation, and skin incision were 21.7 ± 4.37 vs 35.8 ± 3.94 ($p=0.001$), 25.1 ± 4.16 vs 22.0 ± 3.04 ($p=0.8$), 12.8 ± 3.73 vs 22.5 ± 4.02 ($p=0.001$), respectively. (Figure 1)

Conclusions: The NoL reliably increased after intubation and skin incision, but not after tetanic stimulation. There was no significant difference in NoL values after skin incision between the epidural and no epidural groups.



EFIC5-0794

Clinical pain states: Perioperative pain

THE EFFECT OF PERIOPERATIVE ESMOLOL INFUSION ON POST-OPERATIVE PAIN, NAUSEA, VOMITING AND DURATION OF HOSPITAL STAY IN NORMOTENSIVE PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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Background: In an attempt to decrease haemodynamic instability and early postoperative complications such as nausea, vomiting, and pain, esmolol infusion was given to normotensive patients undergoing laparoscopic cholecystectomy.

Methods: Sixty consecutive ASA class I and II normotensive patients about to undergo laparoscopic cholecystectomy were randomized into two groups: an esmolol group (Group ES) was given a 1 mg/kg bolus of esmolol and a placebo group (Group P) was given an identical volume of Normal Saline. Esmolol infusion was given at the rate of 10mcg/kg/min throughout the procedure. After operation, patients reported their nausea using a four-point scale. Pain was recorded using Verbal Rating Scale (VRS) from 1 to 10.

Results: Esmolol had an opioid-sparing effect post-operatively. Postoperative requirements for antiemetics were significantly less in the esmolol group, with no antiemetics given to any patients. In the placebo group, however, 15 (50%) patients required antiemetic drugs. The frequency of PONV did not correlate to the amounts of fentanyl, propofol, postoperative antiemetics consumed, or to female gender, non-smoking status, and history of PONV or motion sickness. Postoperative analgesic consumption in Group ES was significantly lower than in Group P. There was significant reduction in the VRS scores in the Group ES.

Conclusions: Esmolol had an opioid-sparing effect in the immediate postoperative period in normotensive patients undergoing laparoscopic cholecystectomy. When combined with fentanyl and ondansetron, it was more effective than placebo in decreasing early PONV.

SEEKING INDICATORS FOR ASSESSING QUALITY OF POST-OPERATIVE PAIN MANAGEMENT: FINDINGS FROM PAIN OUT

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Background and aims: PAIN OUT, an international registry, aims to provide clinicians with tools for assessing quality of postoperative pain management. Existing indicators have limited usefulness. Recording pain and provision of information about pain treatment correlate weakly with pain-related patient reported outcomes (PROs). We appraised four PROs as indicators of good and insufficient treatment.

Methods: We selected PROs provided on the first postoperative day by 1443 patients undergoing total knee replacement in 13 PAIN OUT institutions. PROs and criteria for care are: (1) *percent time in severe pain (%TimeSeverePain)* $\leq 10\%$ of the time; (2) *percent pain relief (%PainRelief)* $\geq 70\%$; (3) *worst pain (WorstPain)* $\leq 4/10$; and (4) *wish for more pain treatment (WishMorePainTreatment)*: YES. Criteria 1-3, indicate good care, 4, insufficient. We calculated the proportion of patients who fulfilled the criteria in each ward. Correlations between the criteria determined whether they assessed independent constructs.

Results:

Correlations are:

Proportion%TimeSeverePain and **ProportionWishMorePainTreatment** = -.54;

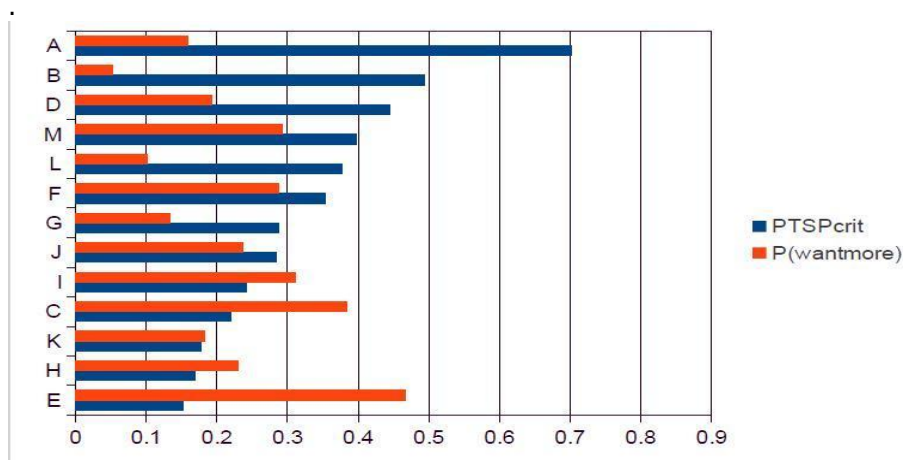
Proportion%TimeSeverePain and **ProportionPainRelief** = .88;

Proportion%TimeSeverePain and **ProportionWorstPain** = .72.

The figure shows that as the proportion of patients fulfilling the criteria for **%TimeSeverePain** decreases, the proportion of patients meeting the criterion for **WishMorePainTreatment** increases.

Conclusions

The high correlation coefficients of **ProportionPainRelief** and **PWorstPain** indicate they measure the same latent construct as **P%TimeSeverePain** and so are redundant. We suggest the proportion of patients in severe pain and those wishing for more medication as two PRO-based criteria to appraise perioperative practices in wards delivering the best care and sharing the information with those whose performance is less good.



A MULTI-DIMENSIONAL INDEX FOR ASSESSING POSTOPERATIVE PAIN MANAGEMENT: RESULTS FROM PAIN OUT

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Background and aims:

Pain intensity may not be sufficient as a sole indicator for assessing the adequacy of postoperative pain management as it fails to account for the treatment of pain. A mismatch between pain intensity and its treatment may indicate inadequacy of pain management. We therefore created three indices relying on principles of existing indices for chronic pain management. We compared the performance of the indices using pain-related patient reported outcomes (PROs) from the international postoperative pain registry, PAIN OUT.

Methods:

Each index was constructed by subtracting a measure of pain intensity from a measure of treatment level. The first index used the WHO pain relief ladder (WHO); the second, included opioid analgesic dosages (Dose); the third comprised information on use of advanced methods of postoperative pain management (regional or patient-controlled analgesia; RA-PCA). Data were obtained from >27,000 adult patients undergoing a variety of procedures. Associations between PROs and the three indices were analyzed using multivariate analysis of variance.

Results:

Patient satisfaction and relief outcomes were positively associated with all indices while interference of pain with function and its effects on feelings were negatively associated with all indices. RA-PCA showed the largest effect sizes (interference of pain with functions -1.105 to -0.787), as well as significant relationships with PROs.

Conclusion:

An acute pain management index accounting for regional- or patient-controlled analgesia might be an attractive instrument to measure and compare the adequacy of postoperative pain treatment in diverse clinical situations.

EFIC5-0892

Cinical pain states: Perioperative pain

PAIN THERAPY FOR AMBULATORY SURGERY

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Introduction: A quality assurance system on the field of pain therapy after ambulatory surgery is in Germany not established. The working group “acute pain” of the German pain society developed the tool “QUIPSambulant” in 2014. We tested this tool in daily practice. Method: 67 men and 84 woman after ambulatory surgery in our hospital received a questionnaire with 12 items (pain intensity, sleep, mood, drug consumption and so on) at the first day after surgery in the time of the surgical visit. Intra- and postoperatively our patients got Metamizol as pain medication. Discussion: For evaluation and discussion of the results with the patients the surgeons needed less than 10 minutes, 8 of 10 surgeons appreciated this questionnaire for their work in future. The results in pain reduction were difficult, 61% of the patients reported pain in movement >4 at the numeric rating scale (0-10), but 81% of the patients were very satisfied with their pain treatment. In the future we will change the pain medication from Metamizol to NSAIDs.

EFIC5-0995

Cinical pain states: Perioperative pain

HORNER'S SYNDROME OCCURRED DURING EPIDURAL ANESTHESIA (CASE REPORT)

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In this case , we aimed to present the Horner's syndrome occurred as a complication of the epidural anesthesia in a pregnant women.

A 31 year old (70 kg, 160 cm) healthy parturient ASA 1, G1P0 was admitted at 39 weeks of gestation. Her clinical history included no allergies to medications, no relevant family history and laboratory values were within normal limits. Epidural anesthesia for lobar pain was planned.. Puncture was performed at the L4–L5 interspace with a 18G Tuohy epidural needle via the median approach with the patient placed in the left lateral decubitus position. After locating the epidural space using loss of resistance to saline technique, an epidural catheter was inserted 4cm. An initial bolus of 10ml of bupivacaine 0.25% and 50mcg of fentanyl was administered and a continuous infusion of bupivacaine 0.1% in addition to 1mcg of fentanyl per ml was programmed at 7ml/hour. 40minutes after the intervention , VAS score was 1/10. Midwife noticed the asymmetry of the patient's face. On examination, there was left-sided ptosis and miosis with no other neurological symptoms or signs . The continuous epidural dose was stopped and switched to intermittent dosing. The patient's symptoms resolved spontaneously over the following 4hours. During that time, spontaneous vaginal delivery occurred without incident. She remained in hospital for 72hours and was discharged home with no neurologic abnormalities. Horner's syndrome is not rare during labour epidural analgesia. Most of the times it is a benign and self-limiting condition; however, it may become a serious systemic manifestation.

PAIN CATASTROPHIZING IN PATIENTS WITH PAINFUL DIABETIC PERIPHERAL POLYNEUROPATHY: ASSOCIATIONS WITH PHYSICAL ACTIVITY, DISABILITY AND QUALITY OF LIFE.

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Aims: To investigate the impact of pain catastrophizing on a patient's level of disability and quality of life in patients with painful diabetic peripheral polyneuropathy (DPNP). Also, to study the mediating role of physical activity and/or a decline in physical activity.

Methods: This questionnaire-based cross-sectional study included 154 patients with painful DPNP. Linear regression analyses adjusted for age, gender, duration of neuropathy, pain intensity and insulin treatment were performed to assess the association of pain catastrophizing (PCS) with the outcome variables disability (PDI) and quality of life (QOL). The mediating role of actual physical activity (PARS) and perceived physical activity decline (PAD) was analysed using mediation analyses (Baron&Kenny).

Results: This study included 154 patients (96 male, 62% patients). Mean age was 65.7 years (SD=6.6). PCS (M=20.3, SD=13.1) was significantly associated with PDI (M=32.4, SD=17.0; $R^2=0.356$, $p<0.001$), QOL (M=52.6, SD=26.1; $R^2=0.437$, $p<0.001$) and PAD (M=7.4, SD=5.7; $R^2=0.087$, $p=0.045$). PAD acted as a partial mediator in the associations of PCS with PDI and QOL respectively. There was no association of PCS with PARS.

Conclusion: Pain catastrophizing was associated with increased disability and decreased quality of life in patients with painful DPNP. Also, it was associated with a perceived decline in physical activity, which had a mediating role in the association between catastrophizing and disability and between catastrophizing and quality of life. The present study underscores the role of catastrophic thinking about pain and the experienced loss in daily activities due to pain, in order to fully understand the burden of painful DPNP.

MULTIFACTORIAL CONSEQUENCES OF COMPLEX INTERACTION AMONG INTENSITY OF PAIN, OPIOIDS USE, EMOTIONS AND COGNITION IN CHRONIC NONMALIGNANT PAIN PATIENTS

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1. Objective. It is widely assumed that neuropsychological function is commonly impaired as a consequence of chronic opioid use. The aim was to find differences in assessment between patients with chronic nonmalignant pain on opioid treatment and a healthy control group.

2. Participants and methods. We included 52 patients, with a mean age 56, FIQ=96, mean time of opioid use of 6 years (fentanyl-17, oxycodone-16, buprenorphine-8, hydromorphone-6, tapentadol-5) and 33 healthy volunteers, with a mean age 42, mean FIQ=105. All 85 subjects were examined with standard neuropsychological battery (WAIS-III, VF, RAVLT, ROFT, EFTT, GPT), measurement of pain intensity (VAS), fear of pain (FPQ-III), reaction time (CompactSR), life satisfaction (DZS), depression (BDI-II) and emotional lability (EPQ-R).

3. Results. In the group of patients we found an impairment in cognitive flexibility (verbal fluency), reaction to auditory stimuli, finger-tapping of non dominant arm (NDA) and manual dexterity bilaterally with higher number of errors. We found higher number of depression, emotional lability, low life satisfaction and above average fear of minor pain. In a group of patients with a higher intensity of pain (n=28, VAS 7-10) we found even more higher susceptibility to suicidal thoughts. In the control healthy group impairment was very low for assessed neuropsychological domains.

4. Conclusions. We found overall neuropsychological differences between patients and healthy control group as multifactorial consequences of complex interaction among intensity of pain, opioids, emotions and cognition. We cannot determine which factors influenced the test results, but pain itself seemed to have an arousal effect on neuropsychological domains.

A NEVER ENDING STORY: DEPRESSION AND PAIN AND THEIR INTERACTING VARIABLES

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Background and aims: The relationship between pain and depression is still indistinct. Recent research suggests that cognitive pain responses predict depression in chronic pain patients. The objective of this study was to analyse the relationships between pain intensity, disability, cognitive pain responses and depressive symptoms and their predictive value on each other six months later in acute/sub-acute back pain.

Methods: Baseline was assessed in orthopaedic clinics in Germany. 164 acute/sub-acute non-specific back pain patients filled the Beck Depression Inventory (BDI), the Kiel Pain Inventory (KPI) and the Pain Disability Index (PDI) at baseline and six months later. Additionally, pain intensity was measured by an 11-point numerical self-rating scale concerning the past seven days. All data analyses were performed using multiple regression procedures.

Results: The first regression analysis showed that help-/hopelessness, disability and gender predicted depression best six months later and predicted a total of 13% of the variance of depression. Results from the second regression analysis revealed that pain intensity at follow-up was best explained by depressive symptoms and predicted a total of 10% of the variance of pain intensity. The third regression analysis showed that disability was best explained by depressive symptoms and predicted a total of 17% of the variance of disability.

Conclusions: Although less variance was explained by this study in predicting depression, pain intensity and disability, the results support a cyclical relationship between pain, depression and disability and cognitive pain responses affect these relationship. Further studies need to concentrate on this cyclical relationship.

HEADACHE PAIN REDUCES PROCESSING SPEED AND ACCURACY ON ATTENTION TASKS

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Introduction- Pain is demanding on attention, and this has been shown to affect performance on a range of tasks such as those measuring working memory, switching and multi-tasking. Typically, this research has used samples with chronic pain or laboratory-induced pain. Here, we investigated the effect of everyday headache pain on six measures of attention.

Methods- Fifty-nine participants completed a battery of attention tasks with and without a headache: a 2-back task to assess working memory, cued and uncued switching tasks to measure switching between multiple tasks with and without a working memory load, a dual task to measure simultaneous multi-tasking, a flanker task to measure inhibition, and a reaction time task to measure processing speed.

Results- Participants responded more slowly to all tasks when they were in pain compared to pain free. However, once changes in basic processing speed were accounted for, these effects lost significance. This suggests that pain decreases processing speed but does not affect response times to more complex tasks over and above this effect. Accuracy was lower on the dual task and cued switching task when participants were in pain, suggesting a specific impairment for effective multi-tasking.

Conclusions- Our findings suggest that common headache pain has a negative effect on multiple aspects of attention. Given the high prevalence of headache in the general population, this could have wide ranging implications.

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DEPRESSION AND LOW BACK PAIN IN HIGH-PERFORMANCE ATHLETES: THOUGHT-SUPPRESSION X STRESS INTERACTION PLAYS A ROLE

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Background/Aims: Back pain as well as depression are increasingly acknowledged as important health problems in high-performance athletes. Both, back pain and depression lead to significant disability and dispensation from competition. Although the need for a neuroscience perspective is suggested, the knowledge on possible biopsychosocial mechanisms is rare. Besides genetic predisposition, emotion regulation, i.e. thought suppression (TS) may play an important role. TS is known to increase feelings of frustration and loss of control caused by frequent failures and a rebound phenomenon. Recent studies indicated that thought suppression may increase depressive mood especially when it is shown in interaction with high chronic stress in daily life.

Methods: 157 high performance athletes (high level competitive sports) with chronic back pain completed a set of questionnaires (Subscale Thought Suppression TSS from the Avoidance-Endurance-Questionnaire AEQ, Beck Depression-Inventory BDI, Stress-Ressources Inventory SRI). Groups with high vs. low TS were built using cut-off, high-low distress using mediana split. A two-way analysis of variance calculated main effects for thought suppression and distress as well as a possible interaction with BDI-depression as dependent, using SPSS-22.

Results: Results indicated significant main effects for distress ($p < .001$) with higher depression scores in athletes showing high stress. Further, a significant thought suppression x stress interaction ($p < .05$) was found: depression was elevated only in athletes showing high thought suppression and high stress.

Conclusions: Maladaptive emotion-regulation strategies such as thought suppression might contribute to elevated depression in high-performance athletes when accompanied with high chronic stress in daily life.

THOUGHT SUPPRESSION AND CHRONIC STRESS IN RELATION TO BACK PAIN AND DISABILITY: DOES AN INTERACTION YIELD COUNTERPRODUCTIVE EFFECTS?

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Background/Aims: Thought suppression is a common strategy responding to pain but is known to have counterproductive effects. It is hypothesized that stress interrupts successful suppression and therefore increases pain-related thoughts and sensations. Findings suggest an important role of thought suppression in pain, although research is in the beginning. This study aims to examine the impact of suppression and stress in back pain and associated disability.

Methods: 177 patients with sub-acute back pain from primary care practices completed a set of questionnaires (Subscale Thought Suppression TSS from the Avoidance-Endurance-Questionnaire AEQ, Stress-Ressources Inventory SRI, Pain Disability Index PDI and average pain intensity during the last week). Patients were distinguished into high versus low TSS by cut-off and high versus low stress by median split. Two-way analyses of variance were calculated, examining main effects of TSS and stress as well as possible interactions in pain intensity and disability.

Results: The ANOVA revealed a significant stress x thought suppression interaction (p

Conclusions: Contrary to the predicted interaction of thought suppression and stress, high thought suppression may be successful in a short-term period: It seems effective in buffering the negative influence of stress on pain intensity. More research is warranted to investigate possible interactions between stress and pain-related cognitions.

THE RELATION BETWEEN TRUE NUTRITION BALANCE AND DISTORTED COGNITION FOR DIET IN PATIENT WITH MUSCULOSKELETAL PAIN.

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Background and aims: The relation between musculoskeletal pain and nutrition balance are poorly understood. In this study, we investigated the relation between true nutrition balance and cognition for diet in patient with musculoskeletal pain.

Methods: 2667 well-being subjects were enrolled in this study. Using self-reported questionnaires, true nutrition balances were scored by the number of differences between true intake and ideal intake for eleven nutrients. Simultaneously subjects were divided into two categories according to a belief that they thought whether their nutrition was well-balanced or not. The presence of musculoskeletal pain (knee, low back, neck) was also identified by the questionnaires, subsequently we divided subjects into the following five different categories by their musculoskeletal condition; a group without musculoskeletal disorder, a group with knee pain alone, a group with low back pain alone, a group with neck pain alone, a group which had overlapping pain in lower back and neck and a group with overlapping pain in all regions.

Results: There was no statistical significance in mean scores of true nutrition balance between control and groups with any musculoskeletal pain by Kruskal-Wallis test ($P=0.84$). However, unbalanced belief for diet was significantly higher in two groups with multi-regional musculoskeletal pain than control by χ -square test ($P<0.001$).

Conclusions: These findings suggest that musculoskeletal pain is not affected by nutrition balance, however, musculoskeletal pain may distort their cognition for diet, such that they think the diet is unbalanced regardless of true nutrition balance.

MOTION IN THE PERIPERSONAL SPACE: THE INFLUENCE OF DYNAMICAL VISUAL STIMULI ON NOCICEPTIVE PROCESSING

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Background and aims: Peripersonal space constitutes a safety margin around the body protecting us against potential physical threats. Within peripersonal space nociceptive stimuli are integrated with stimuli from different modalities (De Paepe et al., 2014). Dynamical stimuli are particularly relevant in this respect, as they might refer to a potential threat approaching our body. In this study we investigated how dynamical visual stimuli, either approaching or receding from the body, can influence nociceptive processing.

Methods: Participants responded by means of foot pedals which hand received a nociceptive stimulation. This stimulation was administered at different delays from the onset of task-irrelevant dynamic lights either approaching or receding from the subjects' left or right hand. We expected that the lights would influence nociceptive processing differentially when they were approaching versus receding from the body.

Results: A repeated measures ANOVA with *Cue* (approaching vs. receding cues), *Laterality* (cue ipsilateral to stimulated hand vs. contralateral to stimulated hand), and *Delay* (170, 450, 730, 1010, 1290, 1460, or 1850 ms) as within participant factors revealed the expected three-way interaction between *Cue*, *Laterality* and *Delay* ($F(6,144)=2.29, p=0.04$). This indicates that the localization of the nociceptive cues was differentially affected when cues were approaching versus receding from the body.

Conclusions: The results of this study demonstrate that nociceptive processing is influenced by visual stimuli. Moreover this effect is dependent on whether the visual stimuli were approaching or receding from the body. This paradigm is currently used to investigate how peripersonal space can be affected by chronic pain.

EFIC5-0317

Clinical pain states: Fibromyalgia

LUMBAR BUT NOT CERVICAL RANGE OF MOTION IN FIBROMYALGIA PATIENTS IS RELATED TO PAIN ACCEPTANCE AND FEAR OF MOVEMENT

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Background and aims: to compare cervical or lumbar spinal range of motion in fibromyalgia patients with asymptomatic subjects and evaluate correlations of spinal movement with selected psychological parameters.

Methods: 79 patients with fibromyalgia were included. Active lumbar or cervical range of motion (ROM total flexion-extension, lateral flexion, rotation) were measured by 3D measurement system according to site of major pain. Patients rated average pain and filled in questionnaires (TSK, PCS, CPAQ, STAIx2, CES D). Spinal range of motion data from 30 asymptomatic subjects was used for comparison.

Results: 42 patients (39 females, 3 males, mean age 50) had major pain in cervical spine and 37 (36 females, 1 male, mean age 49) in lower back. Significant differences ($p=0,000$) in ROM were found between patients and controls in cervical (mean total flex.-ext. 80° vs. 129° , rotation 74° vs. 148° , lateral flexion 52° vs. 84°) as well as in lumbar (mean flex.-ext. 55° vs. 109° , rotation 26° vs. 47° , lat. flex. 19° vs. 58°) patients' group. No significant correlations were found between range of motion, psychological parameters and average pain in major cervical pain group. In major lumbar pain group flex.-ext. ROM positively correlated with chronic pain acceptance (CPAQ total 0,54, activity engagement 0,39, pain willingness 0,48) and rotation ROM negatively with TSK (-0,44).

Conclusions: fibromyalgia patients demonstrated limited cervical or lumbar range of motion, unrelated to average pain intensity and only in case of lumbar ROM possibly related to fear of movement or difficulties with pain acceptance.

EFIC5-0405

Clinical pain states: Fibromyalgia

RESTING-STATE FUNCTIONAL CONNECTIVITY ALTERATIONS IN FIBROMYALGIA PATIENTS

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Background and aims

Fibromyalgia syndrome (FMS) is a chronic pain disorder characterised by widespread pain and tenderness. Ongoing chronic pain may cause a time-dependent reorganisation of resting-state brain networks. This study investigated default mode network (DMN) and pain matrix functional connectivity in FMS patients relative to age-matched healthy control subjects.

Methods

Resting functional magnetic resonance imaging (fMRI) data from FMS patients (n=16) and age-matched healthy controls (n=15) was analysed using a novel method of seed-to-voxel functional connectivity analysis. Seed regions of interest were localised in DMN and pain processing structures using co-ordinates from meta-analyses. Differences in intrinsic connectivity were correlated with clinical and psychological measures.

Results

FMS patients, relative to healthy control participants, exhibited functional connectivity alterations between DMN structures and various brain regions including the parahippocampal gyrus, anterior cingulate cortex, superior parietal lobule and inferior temporal gyrus. No abnormal intrinsic connectivity was identified with pain processing structures. Subsequent analyses revealed that reduced functional connectivity between the posterior cingulate cortex (PCC) in the DMN and the right parahippocampal gyrus in FMS patients was associated with longer duration of symptoms.

Conclusions

The findings suggest that FMS alters DMN connectivity with several extrinsic brain regions. Although no alterations in functional connectivity were identified between specific DMN structures, altered connectivity with parahippocampal gyrus is particularly interesting as it was previously considered to be structure of the DMN. Disrupted functional connectivity between PCC and parahippocampal gyrus was associated with longer symptom duration, which may reflect ongoing time-dependent reorganisation of resting-state networks in FMS.

EFIC5-0530

Clinical pain states: Fibromyalgia

FIBROMYALGIA AND DEPRESSION – NATURE VERSUS NURTURE

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Fibromyalgia is a chronic disorder that causes muscle pain and fatigue. Depression has emerged as the most prevalent mental disorder in patients with fibromyalgia. Family history suggests impact of genetic predisposition for morbidity.

A 45-year-old woman consulted her psychiatrist because of widespread pain and depression. She has had the pain since she was 28, but she had no clinical diagnosis whatsoever until she was 35. Fibromyalgia was diagnosed by a psychiatrist using ACR Preliminary Diagnostic Criteria for Fibromyalgia. Although diagnosed, the fibromyalgia was not treated until she visited the psychiatrist. In her family history her mother had muscle pain and fatigue, mother's two sisters (of three) had a diagnosed fibromyalgia. All sons of women with diagnosed fibromyalgia in her family have a problem with concentration and hyperactivity, some of them have a clinical diagnosis of ADHD. Now she is treated with duloxetine, along with cognitive behavioral therapy. She feels healthy and her life quality has improved much.

This report illustrates the connection between fibromyalgia and depression and treatments of both problems in a psychiatric clinic. This report shows the importance of multidisciplinary treatment focused on the person.

DEPRESSED COGNITIONS IN FIBROMYALGIA PATIENTS: PRELIMINARY RESULTS

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Background and aims: Fibromyalgia (fm) is often associated with depression. However, there is little research on the cognitive content of depression. Previous studies (Pincus, Santos, & Morley, 2007) have found that depressed chronic pain patients produced more negative sentence completions than non-depressed pain patients and healthy controls. The aim of this study is to assess cognitive content in 3 groups: fm patients without depression, fm patients with depression and healthy controls.

Methods: 30 participants took part in the study. The short version of the sentence completion test (SCD; Barton et al., 2005) was used. Sentences included negative, positive and neutral self-reference, and past, future, and interpersonal relationship terms. Complete responses were coded by valence by three independent raters. Depression was assessed by the BDI-II and the FIQ-R.

Results: Fm patients with depression had more negative valence (NV) and less positive valence (PV) terms than each of the others groups (NV, Controls: $M=2.7$ ($SD=1.3$), fm without depression: $M=4.5$ ($SD=2.9$), fm with depression: $M=6.4$ ($SD=2.1$); PV, Controls: $M=6.6$ ($SD=1.9$), fm without depression: $M=6.2$ ($SD=2.9$), fm with depression: $M=3.9$ ($SD=1.9$). A one-way ANOVA showed that there were significant differences between groups in negative [$F(2)=6.85$; $P < .005$] and positive [$F(2)=4.01$; $P < .03$] content. A Bonferroni correction showed that these differences were found between healthy controls and fm patients with depression. No significant differences were found between both groups of fm patients.

Conclusions: This study contributes to the understanding of depression and cognitive content in fm.

EFIC5-0866

Clinical pain states: Fibromyalgia

INFLUENCE AND IMPACT OF PAIN ON THE SYMPTOMS OF FIBROMYALGIA.

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Background and aims

Fibromyalgia (FM) is a complex syndrome that is characterized by lasting and diffuse chronic musculoskeletal pain, derived from non-inflammatory causes and classically associated with the presence of specific tender points. The aims of this study was to determine the impact of pain on the severity of symptoms of Fibromyalgia.

Methods

104 patients diagnosed with fibromyalgia (American College of Rheumatology 2010 criteria) were enrolled in a descriptive cross-sectional, multidisciplinary and multicenter study. Mean age $\pm$ ST: 50,4 $\pm$ 8 years; male: 2. Time of inclusion in the study: 5 months. We measured pain intensity by VAS, and their association with Fibromyalgia Impact Questionnaire (FIQ), Symptom Severity Score (SS-SCORE), Widespread Pain Index (WPI) and number of tender points (NTP). Statistical test: Pearson correlation, Kolmogorov-Smirnov test; statistical significance: $p < 0.05$. Statistical package SPSS v.18

Results

Mean VAS: 6,6 $\pm$ 2, WPI 15,1 $\pm$ 3,1, Mean SS-SCORE part 1: 6,9 $\pm$ 1,7, and part 2: 21,2 $\pm$ 0,6; total SS-SCORE: 9,1 $\pm$ 1,9, FIQ: 74,5 $\pm$ 12,9 and NTP: 15,9 $\pm$ 2,4. There was significant lineal correlation between VAS and FIQ ($p = 0,000$), WPI ($p = 0,04$) and NTP ($p = 0,004$).

Conclusions

Pain intensity (in patients with fibromyalgia) measured by VAS has a significant lineal correlation with different values of FIQ, WPI and number of tender points.

DO ABERRATIONS IN THE PERIPHERAL BLOOD MONOCYTES CONTRIBUTE TO FATIGUE IN PATIENTS WITH FIBROMYALGIA?

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Background and aims: The role of immune system is not completely understood in fibromyalgia (FM). The main symptoms, musculoskeletal pain and fatigue, are disabling and overlap with clinical symptoms in rheumatic disorders. The aim of this study was to investigate the response of peripheral mononuclear blood cells (PBMC) to mitogens and correlate with clinical symptoms.

Methods: 14 FM (mean age 48.1, SD 10.8) and 15 (48.3, 11.8) matched control females were included in the study. Clinical symptoms were scored by self-rated questionnaires: pain intensity, Short Form (SF-36) and Multidimensional Fatigue Inventory (MFI-20). The PBMC were analysed using flow cytometry (FACS) before and after stimulation with lipopolysaccharide (LPS) or a combination of ionomycin (IO) and phorbol myristate acetate (PMA).

Results. FM patients show higher pain intensity, lower quality of life and increased fatigue as compared to controls. Results show no significant differences in B- or T-lymphocytes before and after stimulation with IO+PMA between the groups. However, the total amount of monocytes was increased before stimulation in FM patients ($p=0.01$) and showed tendency to different pattern of activation after stimulation with LPS compared to controls. Correlation analysis showed significant positive correlations ($r=0.5-0.9$, $p<0.05-0.001$, $N=18$) between MFI-20 fatigue scales and monocyte population in the whole study population and in FM but not control group.

Conclusions. Results indicate that aberrations in the non-specific immune system might contribute to fatigue in FM. Further research on immunological components involved in FM is needed to understand the pathophysiology and maybe find a new treatment approach.

EFIC5-0973

Clinical pain states: Fibromyalgia

IS HEALTH ANXIETY A FACTOR OF INTEREST IN FIBROMYALGIA?

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Background and aims

Fibromyalgia is a complex condition involving generalized pain, numerous non-specific bodily symptoms, anxiety, depression, sleep disorders and fatigue. Health anxiety has been associated with pain conditions and non-specific bodily symptoms, but little is known about the impact of health anxiety in fibromyalgia. The aims of the study are: 1) Is health anxiety associated with pain levels and other well-known symptoms in patients with fibromyalgia? 2) Are there any changes in these associations after three months of treatment in an outpatient fibromyalgia group?

Methods

Patients (18-70 yrs., n=100) admitted to an outpatient's clinic at a Central hospital in Norway, fulfilling the ACR-90 criteria of fibromyalgia, were included in this study. Validated instruments measuring pain intensity, sleep disturbance and quality of life, were used. A sub-group of these patients (n= 45) were explored after treatment in an outpatient specialized group rehabilitation program of two hour sessions, once weekly for twelve weeks. The program included general information and education about diagnosis, low impact training, mindfulness-based relaxation techniques, psychosocial counselling, and homework between sessions.

Results

The results will be presented at the EFIC 2015 Congress. Preliminary results showed high levels of health anxiety in more than 50% of the included patients. Significant associations were found between high levels of health anxiety and pain, and sleeping problems.

Conclusion

Health anxiety could be an under-estimated factor in fibromyalgia.

**BAROREFLEX SENSITIVITY DURING LABORATORY STRESS AND RELAXATION
INDUCTION IN FIBROMYALGIA PATIENTS AND THEIR HEALTHY ACQUAINTANCES**

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Background and aims: Animal and human studies show an inverse relationship between blood pressure and sensitivity to painful stimuli. Baroreceptors within the aortic arc and carotid sinuses provide an important link between cardiovascular and pain regulatory systems. Information on pressure changes registered by baroreceptors is relayed to brainstem areas that induce regulation of pain, blood pressure, and sleep by a nucleus tractus solitarius (NTS)-reflex arc. In this study we examined blood pressure (BP), baroreflex sensitivity (BRS) and heart rate variability (HRV) in fibromyalgia (FM) patients and in their healthy acquaintances.

Methods: 34 FM patients and 36 healthy controls (HC) participated in a 30 min psychophysiological session with baseline, alternating mental and physical stress, and three relaxation phases. Subjects rated subjective pain and stress levels after each phase. BP and HRV were recorded continuously.

Results: FM showed a significant lower BRS compared to HC (all p 's<0.01). While HC show significantly higher BRS in stress than in relaxation phases, this pattern is reversed in patients (all p 's<0.01). Furthermore, FM patients reported significantly higher subjective pain ratings as well as lower HRV and constantly higher blood pressure than HC during all phases (all p 's<0.01).

Conclusions: The decreased BRS and HRV suggest a diminished NTS-reflex arc in fibromyalgia that may mediate the underlying etiology and maintenance in a hypertensive subgroup of FM and suggests a new treatment approach for this subgroup.

EFFICACY OF DISTRACTIONS METHODS ON PROCEDURAL PAIN AND ANXIETY IN CHILDREN

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Background and aims: Pain is a highly prevalent problem in children and adults. It is a predominantly subjective emotional distress and it also leads to impairment in the quality of life. Medical procedures that are applied using a needle, such as venipuncture and immunization are the most common and important sources of pain for children, causing anxiety, distress and fear. Moreover, fear of pain which is experienced due to medical procedures in childhood usually continues up to adulthood.

Methods: Pain management includes pharmacological and non-pharmacological approaches. Non-pharmacological approaches often include distraction activities such as singing, reading, listening to music, balloon inflation or playing a game. In this study, review of the literature with regard distraction methods.

Results: Distraction methods are widely used to reduce procedural pain and anxiety. The methods performed in various ways during medical procedures divert the focus of attention. Recently, some studies demonstrated that distraction cards were very effective in reducing procedural pain and anxiety in children during phlebotomy. It has been shown that distraction with music may have a positive impact on pain and distress for children undergoing intravenous placement. Also it has been shown that distraction with balloon inflation is also beneficial method for pain during phlebotomy.

Conclusion: Nurses need to be aware of procedural anxiety and pain. Nurses can use distraction methods for procedural pain and anxiety relief in children.

THE EFFECTS OF THREE DIFFERENT DISTRACTION METHODS ON PAIN AND ANXIETY IN CHILDREN

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Background and Aims: This study aims to investigate of three different distraction methods (distraction cards, listening to the music of cartoon and balloon inflation) on pain and anxiety relief of children during phlebotomy.

Methods: This study is a prospective, randomized and controlled trial. The sample consisted of 6-12 year-old children who require blood tests. Children were randomized into four groups; as the distraction cards, the music, the balloon inflation and the control. Data were obtained by interviewing with the children, their parents and the observer before and after the procedure. The pain levels of the children were assessed by the parent and observer reports as well as self-report using the Wong Baker FACES (WB-FACES). The anxiety levels of children were assessed by parent and observer reports using Children Fear Scale (CFS).

Results: One hundred and twenty children (mean age, 9.1±1.6 years) were included. The self-reported procedural pain levels showed significant differences among the study groups ($p=0.040$); the distraction card group (2.33 ± 3.24) had significantly lower pain levels ($p=0.057$) than the control group (4.53 ± 3.23). The distraction card group had the lowest pain levels (2.33 ± 3.24). The procedural child anxiety levels reported by the observer showed a significant difference among the study groups ($p=0.032$). The anxiety levels in the balloon inflation group was significantly lower than the other groups (distraction card, listening to the music of cartoon and control) ($p=0.049$)

Conclusion: All the forms of distraction, distraction card, listening music of cartoon and balloon inflation, significantly reduced pain and anxiety perception.

PERSISTENT PAIN AFTER PACEMAKER INSERTION – A FREQUENT COMPLICATION?

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Background and aims

Between 1992 and 2009 2.9 million pacemakers were inserted in the USA. Implantation of a pulse generator is associated with varied complications one of which is pain, however publications on this phenomena are scant. We report here on a series of patients who developed pain after pacemaker insertion.

Methods

Permission for data evaluation was provided by the IRB of our institution. Between 2012 and 2014 eleven patients were identified on follow-up visits to the pacemaker clinic as having persistent pain. Their charts were reviewed and they were seen in the chronic pain clinic.

Results

Of the eleven patients, 8 were women; the age range was 27 to 74 years; the procedures involved both pacemakers and defibrillators. In three of the eleven cases, insertion was noted as being difficult and several patients had multiple surgical interventions as a result of the pain. Patients were treated with various combinations of repositioning, medications and interventions such as nerve blocks. To date treatment has achieved success in 5 patients. The type of pain was mostly neuropathic and was due to postoperative sensitization. Duration of pain has varied from a few months to a few years. Four patients are still being followed.

Conclusion

Factors which may be involved in generating pain at the site of the pacemaker insertion are infection of the tissues, scar formation around the device or contraction of fibrous tissue around the capsule. What is of utmost importance is rapid treatment to avoid lifelong suffering related to this complication.

COMMONLY-AVAILABLE ACUTE PAIN TREATMENTS – COMBINATIONS AND FORMULATIONS

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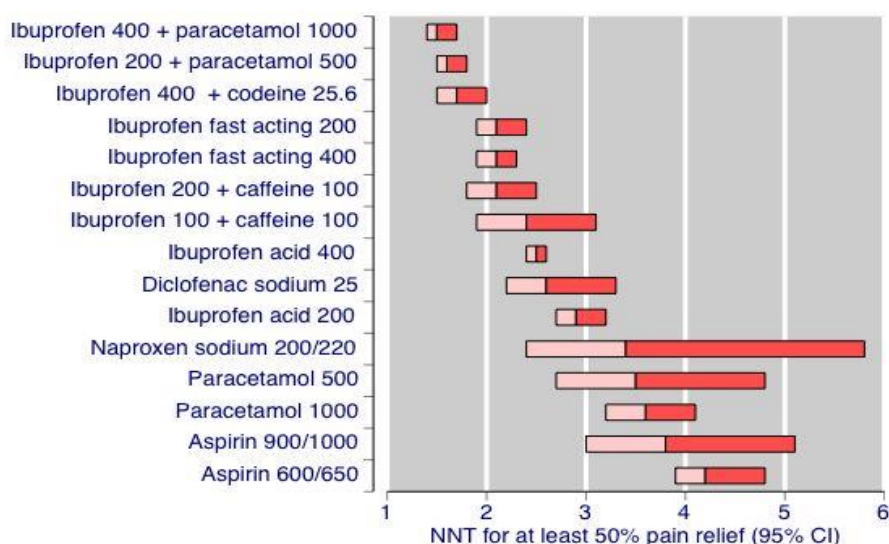
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Background and aims: The single-dose postoperative pain model is an established method for testing analgesic efficacy in acute pain. It has been used for over 60 years, and results can be extrapolated to a range of acute pain conditions. Non-prescribed analgesic drugs are used at least monthly by around 20% of adult populations in Europe. We wanted to compare the relative efficacy of oral analgesic drugs commonly available without prescription in Europe.

Methods: We used Cochrane reviews to collect data on aspirin, diclofenac, ibuprofen, naproxen, and paracetamol at standard non-prescription doses. We also looked at combinations of ibuprofen with caffeine, codeine, and paracetamol, and aspirin with paracetamol plus codeine.

Results: The amount of information for each drug and dose combination varied between analyses from 202 to over 5,000 patients. Not all available non-prescription oral analgesics could be identified, and Cochrane reviews were not available for some that were identified. Combinations of ibuprofen 200 mg or 400 mg with paracetamol, caffeine, and codeine, together with fast-acting ibuprofen formulations, produced the best NNTs, with values in the range of 1.5 to 2.5 (absolute percentage benefiting 66% to 40%).

Conclusions: Rapidly absorbed formulations and combinations of different analgesics, or analgesics with caffeine, produced good analgesia. These drugs are available in fixed doses in a single tablet. They can also be taken separately. Current advice might be to take 200 mg ibuprofen (ideally fast-acting), with 500 mg paracetamol, washed down with a strong cup of coffee.



EFIC5-0361

Clinical pain states: Procedural pain

POST-THORACOTOMY PAIN SYNDROME: A DANISH STUDY

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Background and aims: Post-thoracotomy pain syndrome occurs in up to 80% of cases following thoracic surgery. The purpose of this study was to investigate the prevalence, characteristics, and impact of post-thoracotomy pain syndrome on quality of life following thoracic surgery in Denmark. Predictive factors of post-thoracotomy pain syndrome were also assessed.

Methods: A questionnaire was designed and sent to 200 patients who had undergone thoracotomy or video-assisted thoracoscopic surgery for lung cancer from December 2008 to April 2012 at Aalborg University Hospital.

Results: Data were analyzed for 96 thoracotomies and 37 video-assisted thoracoscopic surgeries. The prevalence of post-thoracotomy pain syndrome did not differ ($p>0.05$) between patients undergoing thoracotomy (30%) and video-assisted thoracoscopic surgery (24%). Neuropathic pain symptoms were found in 95% of patients with post-thoracotomy pain syndrome. Predictive factors included acute post-operative pain ($p<0.01$) and duration of hospital stay ($p<0.05$). The quality of life was negatively affected in patients with post-thoracotomy pain syndrome ($p<0.01$) compared with patients without the syndrome.

Conclusions: Post-thoracotomy pain syndrome occurred in nearly 30% of the cases and neuropathic pain symptoms were a frequent feature. To prevent pain and enhance the quality of life of future patients, risk factors of post-thoracotomy pain syndrome should be considered in order to develop new therapeutic strategies.

EFIC5-0439

Clinical pain states: Procedural pain

RANDOMIZED CONTROL TRIAL INVESTIGATING OPTIMAL PREVENTATIVE PAIN TREATMENT BEFORE DRAIN REMOVAL

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Background

The removal of a drain is both a painful and frightening experience and should be managed with as little pain and distress as possible. Analgesic practices vary widely and may range from mild analgesics such as paracetamol and codeine (Gift et al, 1991. Kinney et al, 1995. Broschious 1999) However, research to determine the prevalence of, and most appropriate treatment for, chest and abdominal drain removal pain is limited

Aim

Identify the most effective pain relief drug to be administered preventatively before drain removal.

Method

Randomized control trial (RCT) using a computerized program for randomization into 2 groups; one receiving Oxycodone 5 mg and the other Dipyrone 1 gram. The baseline pre-study group data was used as control. Study was performed simultaneously in 2 surgical departments in one university hospital

Results

A total of 150 patients in 2 departments participated in this trial; 50 control, 50 received Dipyrone before drain removal and 50 received Oxycodone before drain removal. Among the treatment group 30% reported no pain at all during drain excision compared to 17% of the control group ($p < 0.001$). 40% of the control group reported severe pain during drain excision compared to 25% Optalgin group and 10% in Oxycodone group (control compared to treatment group ($p < 0.05$) Regarding pain severity 1 hour post drain removal, 6% of control group suffered from severe pain compared to 0% severe pain in both treatment groups ($p < 0.001$)

Conclusions

This research improved pain care and patient outcome while updating medical practice.

EFIC5-0619

Clinical pain states: Procedural pain

NURSES DUTIES IN MEDICAL MANIPULATIONS CAUSED PAIN CARE

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Background and aims

Base of nurse practice is necessity to help to find for the patient the best reaction of adaptation to the impact of stress. The goal of the care is to determine and to maintain person's maximal condition of wellness. That is possible, if one perceives the patient as united physiological, psychological, sociocultural unity and provides a holistic approach to patient's care. The aim of the study to clarify nurses' duties in medical manipulation caused pain care.

Methods

Survey utilizes quantitative research method. As an investigation tool is chosen questionnaire. Survey was carried out in surgical and internal diseases wards in regional hospital in Latvia. Questionnaire embraced 40 surgical and internal diseases nurses and 60 patients.

Results

Any invasive procedure cause pain and subjective sense of fear in patients (92,5%) anxiety, discomfort (90%) both in surgical and internal diseases profile patients.

Either nurses and patients deem that most painful procedures are wound dressing, surgical operations, NG tube insertion and injections in abdominal wall. Patients consider i/m route of administration of medicine as very painful ($p=0.000$). A lot of patients associated fears from injections with fear from insensitive staff (35%), fears of after effects (31,6%) and fears linked to lack of information ($p= 0.001$).

Conclusions

Nurses consider objective evaluation of patient's condition, active involvement of patient in selfcare, providing prescribed medication, psychological and physical comfort for patient as most important things in medical manipulations caused pain care.

MORPHINE SUPPOSITORY VERSUS SUPPOSITORY INDOMETHACIN IN THE MANAGEMENT OF RENAL COLIC: RANDOMIZED CLINICAL TRIAL*M. Aghili¹, F. Zamanian¹, M. Jalili¹, M. Moradi-Lakeh², M. Kia³, R. Aghili⁴**¹Department of Emergency Medicine Imam Khomeini Hospital, Tehran University of Medical Sciences, Tehran, Iran**²Associate Professor of Community Medicine, Iran University of Medical Sciences, Tehran, Iran**³Department of Internal Medicine Dr. Ziaei Hospital, Tehran University of Medical Sciences, Tehran, Iran**⁴Endocrine Research Center (Firouzgar) Institute of Endocrinology and Metabolism, Iran University of Medical Sciences, Tehran, Iran*

Background and aims: Renal colic is considered as a medical emergency due to the rapid onset and devastating nature of its pain. Opioids and non-steroidal anti-inflammatory drugs (NSAIDs) are both used as first line choices in its management. The aim of this study was to compare the efficacy and safety of opioids and NSAIDs in the management of acute renal colic.

Methods: One-hundred and fifty-eight patients (102 female and 56 male) were divided into two groups (n=79) and received either 10 mg morphine or 100 mg indomethacin suppositories. The severity of pain was measured using verbal numeric rating scale at baseline and 20, 40, 60 and 90 minutes after the administration of analgesics. Drug side effects as well as patients' vital signs were also recorded.

Results: The mean decrease in the pain score during the first 20 minutes after the admission was significantly higher among those who received suppository morphine comparing to those who received suppository indomethacin (5.46 ± 1.34 vs. 4.36 ± 1.62 , $P < 0.001$). However, no significant difference was observed between the two groups regarding the mean decrease in pain score during the first 40, 60 and 90 minutes after the admission. There was no significant difference between the two groups regarding the prevalence of drug side effects or changes in the vital signs.

Conclusions: Morphine suppositories seem to be more efficient in achieving rapid pain relief comparing to their indomethacin counterparts. Hence, morphine remains as a yet irreplaceable analgesic in the management of acute pain among renal colic patients.

Table 1. Demographic data of the study population

	Group A	Group B	Total	P-value
Age (year)	37.2±10.6	37.3±11.5	37.4±11.1	0.9
Weight (Kg)	74.1±11.9	73.4±11.8	73.8±10.4	0.9
Male/Female	1/75	1/88	1/122	0.6

Group A: Patients received suppository morphine

Group B: Patients received suppository indomethacin

Table 2. The mean decrease in the pain score during the first 20, 40, 60 and 90 minutes after the admission in group A and B.

Duration	Group	Decrease in the pain score	
		Mean $\pm$ SD	P-value
0-20 minutes	Group A	5.46 $\pm$ 1.34	<0.001*
	Group B	4.37 $\pm$ 1.63	
0-40 minutes	Group A	6.26 $\pm$ 1.62	0.3
	Group B	6.04 $\pm$ 1.59	
0-60 minutes	Group A	6.27 $\pm$ 1.79	0.3
	Group B	6.11 $\pm$ 1.66	
0-90 minutes	Group A	6.28 $\pm$ 1.75	0.4
	Group B	6.07 $\pm$ 1.67	

Group A: Patients received suppository morphine

Group B: Patients received suppository indometacin

SD: Standard Deviation

*, Statistically significant

Table 3. The mean change in the systolic and diastolic blood pressures among the two groups during the first 20, 40, 60 and 90 minutes after the admission

Duration	Group	Change in the systolic blood pressure		Change in the diastolic blood pressure	
		Mean $\pm$ SD	P-value	Mean $\pm$ SD	P-value
0-20 minutes	Group A	3.18 $\pm$ 3.62	0.1	0.65 $\pm$ 2.34	0.3
	Group B	2.36 $\pm$ 3.37		0.13 $\pm$ 4.29	
0-40 minutes	Group A	1.43 $\pm$ 3.33	0.2	0.71 $\pm$ 2.39	0.7
	Group B	2.39 $\pm$ 3.96		0.52 $\pm$ 4.47	
0-60 minutes	Group A	1.79 $\pm$ 3.90	0.09	0.97 $\pm$ 2.81	0.4
	Group B	3.19 $\pm$ 3.94		0.52 $\pm$ 4.38	
0-90 minutes	Group A	1.64 $\pm$ 3.5	0.06	0.92 $\pm$ 3.02	0.7
	Group B	3.03 $\pm$ 3.83		1.06 $\pm$ 2.39	

Group A: Patients received suppository morphine

Group B: Patients received suppository indometacin

SD: Standard Deviation

*, Statistically significant

EFIC5-0025

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

ANTIHYPERALGESIC EFFECTS OF IV PEEMTIVE ADMINISTRATION ACITOMENOFEN ON HIGH-DOSE FENTANIL-INDUCED HYPERALGESIA IN PEDIATRIC PATIENT AFTER ONCOLOGY ABDOMINAL SURGERY.

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Background: We aimed to investigate the antihyperalgesic effects of IV peemtive administration acitomenofen on high-dose remifentanil-induced hyperalgesia in pediatric patients.

Methods: 46 ASA physical status 3-4 patients undergoing oncology abdominal surgery were randomly assigned to one of the following three groups, each of which received either IV peemtive administration acitomenofen (an initial dose of 1.5 ml/kg for 40 min before before the induction of anesthesia) or placebo saline 40 min before the induction of anesthesia and intraoperative fentanil infusion: group LRH received a placebo and 0.05 µg/kg/min fentanil; group RH received a placebo and 0.3 µg/kg/min fentanil; and group ARH received IV peemtive administration acitomenofen and 0.3 µg/kg/min fentanil.

Results: The mechanical hyperalgesia threshold 12 hr after surgery was significantly lower in group RH than in the other two groups. Postoperative pain intensity using visual analog scale and cumulative volume of a patient controlled analgesia containing morphine over 12 hr were significantly greater in group RH than in group ARH. The time to the first postoperative analgesic requirement was significantly shorter in group RH than in the other two groups. The desflurane requirement was significantly greater in group LRH than in the other groups. The frequency of hypotension and bradycardia was significantly higher, but shivering and postoperative nausea and vomiting were significantly lower in group ARH than in the other two groups.

Conclusions: High-doses of fentanil induced hyperalgesia, which presented a decreased mechanical hyperalgesia threshold, but IV peemtive administration acitomenofen alleviated those symptoms.

EFIC5-0036

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

EFFICACY AND SAFETY PROFILE OF COMBINATION OF TRAMADOL-DICLOFENAC VS TRAMADOL-PARACETAMOL IN A SUB-GROUP OF PATIENTS WITH POST OPERATIVE PAIN: A PHASE III 5 DAY, OPEN LABEL STUDY

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Background and Aims: Post-operative pain management involves Paracetamol, Tramadol and Diclofenac as the first line of treatment. This study was designed to evaluate safety and efficacy of fixed dose combination (FDC) of tramadol/diclofenac vs. FDC of tramadol/paracetamol in patients with acute post-operative pain.

Methods: This was a randomized, open labeled, comparative , parallel group, multicentric trial. 50 patients with acute post operative pain were randomized to receive either of the two treatments Group A received FDC tramadol-hydrochloride 50mg immediate release/diclofenac-sodium 75mg sustained release (one tablet twice daily) and Group B received FDC tramadol-hydrochloride 37.5mg/paracetamol 325mg (two tablets every 4-6hours upto a maximum of 8 tablets daily) for 5 days. Primary efficacy end points were reduction in pain intensity from baseline at day 3 and day 5 as assessed by Visual Analogue Scale (VAS) score.

Results: Group A showed a significant reduction in VAS scores for overall pain, from baseline, on day3 ($p < 0.0001$) and day5 ($p < 0.0001$) as compared to group B.

There was significant reduction in NRS scores in group A at 2 hr. ($p = 0.028$), at 4 hr. ($p = 0.002$) and at 8, 16 and 24 hrs ($p < 0.0001$) as compared to group B

The study medication had few mild to moderate adverse events (nausea, vomiting, epigastric pain, gastritis) which required minimal management without any treatment discontinuation.

Conclusion: FDC of tramadol/diclofenac showed significantly greater reduction in pain intensity and was well tolerated as compared to tramadol/paracetamol resulting in a better analgesia in patients suffering from post-operative pain following orthopedic surgery.

PAIN MANAGEMENT IN SURGICAL INTENSIVE CARE UNITS: A NATIONAL, MULTI-CENTER, PROSPECTIVE, OBSERVATIONAL STUDY

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Introduction: This study is a part of the Multi-Center ThaiUniversity-based Surgical Intensive Care Units Study (THAI-SICU Study). It aimed to evaluate patterns of pain management in patients admitted to surgicalintensive care units.

Methods: Case record forms (CRFs) were created by the workinggroup. Data regarding pain management in the ICUs were documented on the dailyrecord form. These included types of analgesics used (opioids and non-opioids), routes of administration (oral, intravenous, intramuscular, epidural andintrathecal) and methods of administration (continuous infusion, regularintermittent, as needed, patient-controlled analgesia and patient-controlledepidural analgesia).

Results: Data were gathered from 4,652 patients. The majority of the patients received analgesics (85.23%). The mainstay analgesics were morphine (52.26%) and fentanyl (26.96%). Analgesics were frequently administered via intravenous route (76.50%) on an as needed basis (48.62%).

Conclusion: Analgesics were commonly given to the patients in the surgical intensive care units. The analgesics of choice were strong opioids. The most preferred route and method of administration were intravenous route and as needed, respectively.

EFIC5-0230

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

PHASE 3 INTEGRATED SAFETY AND EFFICACY ANALYSIS OF THE SUBLINGUAL SUFENTANIL TABLET SYSTEM

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BACKGROUND/AIMS: The sufentanil sublingual tablet system (SSTS) is a non-invasive, patient-controlled analgesia (PCA) drug/device product-candidate currently under review by the European Medicines Agency for treatment of moderate to severe acute pain in a hospital setting. The system allows patients to self-administer sufentanil 15mcg tablets via handheld device with a 20-minute lockout interval. An integrated safety and efficacy analysis across all Phase 3 studies comparing SSTS to placebo and IV PCA morphine (MS) was recently performed.

METHODS: Data from two double-blind, placebo-controlled trials and one open-label, active comparator trial vs. MS in patients undergoing major open abdominal or joint replacement surgery were integrated. Analgesic efficacy was assessed using the pain intensity difference to baseline (PID) and Pain Relief over 48 hours. Safety assessments incorporated spontaneously reported adverse events (AEs), vital signs, oxygen saturation and the use of concomitant medications.

RESULTS: 606 patients were randomized to SSTS, 162 to placebo and 180 to MS. Primary efficacy outcome measures were achieved across all three studies. Pooled analyses of the PID results at each time point demonstrated statistically greater PID from 45 minutes through 6 hours for SSTS vs. MS. AE's in general were mild to moderate in severity and similar across all treatment assignments.

CONCLUSION: These data suggest analgesic efficacy and tolerability of sufentanil 15mcg tablets dispensed sublingually by patients as frequently as every 20 minutes is comparable to 1mg MS q6 minutes. Statistically significant differences in favor of SSTS were also noted in pain intensity scores from 45 minutes through 6 hours.

EFIC5-0322

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

SYSTEMIC POSTOPERATIVE MULTIMODAL ANALGESIA IN MAJOR OPEN ABDOMINAL SURGERY WITH INTESTINAL ANASTOMOSIS: THE CONSIDERATIONS OF OPIOID-SPARING, NSAIDS-SPARING AND COMBINED OPTIONS

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Background and aims: NSAIDs as part of systemic multimodal analgesia (SMA) in surgery with intestinal anastomosis are associated with increased risks of anastomotic leaks. There is insufficient evidence to stop using them as well as to recommend alternative such as Tramadol. The aim of our study was to provide data on clinical relevance of both alternatives and their combinations in the field.

Methods: Seventy patients, ASA I-IV, aged ≥ 18 , who underwent 43 colorectal (gr.A) and 27 upper GI/biliary (gr.B) open procedures with intestinal anastomosis were examined retrospectively. Three types SMA were indentified 72 h postoperatively: opioid-free (Dexketoprofen 50 mg i.v. or Dipyrone 2,0 g i.m. at 8-12 h); NSAIDs-free (Tramadol 100 mg i.v. at 8-12 h); and combined (Dexketoprofen 50 mg i.v. + Tramadol 50 mg i.v. or Dipyrone 1,0 g i.m. + Tramadol 50 mg i.v. at 8-12 h). All patients were received scheduled Paracetamol 1,0 g at 6 h, optional epidural analgesia and as needed Pethidine 50 mg i.v. as well. Data influencing prescribing practice (ASA and RCRI scores, type and duration of surgery, bleedings/transfusions, malignancy, NSAIDs and Tramadol consumption) and relevant complications (anastomotic leaks, wound infections and cardiovascular adverse events) were explored and tested statistically.

Results: The only between-group differences were 3 complications (one from each type) in gr.B v.s 0 in gr.A ($p=0,015$) and a tendency towards 2 times more Dipyrone consumption in gr.B ($p=0,054$).

Conclusions: As part of SMA Tramadol could usefully reduce the amount of NSAIDs applied in abdominal surgery with intestinal anastomosis.

EFIC5-0609

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

ORGANIC CATION TRANSPORTER OCT1 AND CYP2D6 INFLUENCE TRAMADOL PHARMACOKINETICS AND EFFICACY

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Background: Genetic variants in the metabolizing enzyme CYP2D6 (cytochrome P4502D6) are well known to affect pharmacokinetics and efficacy of tramadol. Recently, also genetic polymorphisms in the liver organic cation transporter OCT1 were shown to affect plasma concentration of (+)O-desmethyltramadol, the active metabolite of tramadol. In this study the influence of OCT1 polymorphisms on tramadol analgesia and pharmacokinetics was analyzed in patients recovering from surgery.

Methods: After approval of the ethics committee and written informed consent 205 patients receiving tramadol via patient-controlled analgesia were enrolled. OCT1 genotypes and genotype dependent CYP2D6 activity scores representing no (PM), intermediate (IM), extensive (EM) or ultra-rapid metabolism (UM) were determined. Plasma concentrations of (+)O-desmethyltramadol ((+)ODT) were measured (mean AUC (5%/95%-CI)). Primary endpoint: Tramadol consumption up to 48 hours after surgery (repeated measure ANOVA).

Results: Zero, one and two active OCT1 alleles were carried by 19, 82 and 104 patients (age 57.3±12.6 years). The average (+)ODT plasma concentrations (AUC) were 99.3 (53/144) and 64.5 (52/77) ng·h/ml in carriers of zero versus two active OCT1 alleles (p=0.03). In line with this, the cumulative tramadol consumption was lowest in carriers of no active OCT1 allele (p=0.025). This finding was confirmed in the subgroup of CYP2D6EM (p=0.01). OCT1 effects were most pronounced in CYP2D6EM and UM, suggesting limiting effects of OCT1-mediated hepatic uptake only in the presence of active hepatic metabolism.

Conclusions: In addition to CYP2D6, OCT1 polymorphisms being responsible for variance of carrier-mediated (+)ODT-uptake in the liver affect the efficacy and pharmacokinetics of tramadol in postoperative patients.

EFIC5-0739

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

ANALGESIC EFFICACY OF DEXKETOPROFEN/TRAMADOL VERSUS DEXKETOPROFEN, TRAMADOL, AND PLACEBO: ANALYSES BY PAIN RESPONSE RATE

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Background and aims. Two randomized clinical trials assessed the superior analgesic efficacy in moderate-to-severe pain of dexketoprofen/tramadol 25mg/75mg combination in comparison to dexketoprofen 25mg, tramadol 100mg, and placebo. Patients were considered responders if pain intensity (PI) at 8 hours was

Methods. Data from two similar studies, including patients experiencing pain of at least moderate intensity in the day after surgery (abdominal hysterectomy or total hip arthroplasty) and after a predefined period from postoperative analgesia discontinuation were re-analysed with different response criteria.

Results. 1247 patients, mean age 55 (SD: 11) were randomized. Applying the PI-VAS

Applying the PI-VAS <0.001).

For the PI-VAS

Conclusions. The superiority of the dexketoprofen/tramadol combination was consistently demonstrated by applying the standard as well as most stringent criteria to define analgesic response.

EFIC5-0813

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

MAIN PREDICTIVE FACTORS FOR PAIN AND POSTOPERATIVE NAUSEA AND VOMITING IN ONCOLOGICAL PATIENTS.

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Background and aims: In the postoperative period, many patients have severe pain, irrespective of the type of surgery. Postoperative nausea and vomiting (PONV) are also a challenge to anesthesiologists. The aim of the study was to analyze the main risk factors for pain and PONV after oncological surgery. **Methods:** A prospective observational study was conducted at the Cancer Institute of the State of São Paulo (ICESP), Brazil. Adult patients submitted to oncological surgeries, were asked about smoking status, history of previous PONV, presence of nausea and vomiting and severity of pain at rest and during movement during the last 24 hours after surgery.

Results: Data from 646 postoperative patients were analyzed. Most of the patients are female (60.16%) and smokers (51.47%). Previous chronic pain was reported in 28.53% respectively. Opioid chronic use and previous chronic pain were found as main predictive factors for acute postoperative pain in the first 24 hours after surgery. Most of the patients (63.58%) with previous chronic pain were female.

Female gender is risk factor for PONV, not pain. Vomiting induced by Intravenous PCA was significantly different (16.6% and 9.52%) in women and men respectively.

Conclusions: our results suggest that oncological patients should be monitored closely in the early stage after surgical intervention. Female sex was risk factor for PONV, not a predictive factor for postoperative pain.

EFIC5-0559

Clinical pain states: Complex regional pain syndromes

PAINFULLY AWARE: A MIXED METHODS ANALYSIS OF HOW PERSONS WITH CRPS PERCEIVE LIMB POSITION AND MOVEMENT

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BACKGROUND AND AIMS – Complex regional pain syndrome (CRPS) is a perplexing condition associated with pain disproportionate to the injury, and subsequent changes in cortical processing of sensory and motor information. Previous work has qualitatively examined perceptual disturbances, and we undertook to look at the same constructs as a subset of data gathered as part of a larger study on the experience of living with CRPS.

METHODS- We conducted cognitive debriefing of a self-reported assessment of CRPS in development by interviewing 45 persons with CRPS recruited from a Canadian patient network. For this examination, we extracted the responses to the items related to proprioceptive disturbances and conducted both a statistical analysis of item scores and qualitative analysis of transcript text using an interpretive description framework.

RESULTS- Four qualitative themes were developed from the coded transcripts: *disconnected from my brain*, *defensive movement*, *progress and progression*, and *the new normal*. The proprioceptive items demonstrated a weak relationship ($r=0.34$, $p=0.01$) to each other and scores did not differ across upper or lower limb involvement ($p>.50$).

CONCLUSIONS- Participants described changes in the planning and experience of movement, and how this impacted daily activities. However, these changes were variable across persons, intensity, time course, and recovery. These descriptions offer insights into motor patterns seen in the clinical setting, and may assist clinicians in the interpretations of formal assessments and informal observations of CRPS patients, informing treatment strategies in pain management and rehabilitation.

PRESERVED DESCENDING PAIN INHIBITION IN COMPLEX REGIONAL PAIN SYNDROME: A PSYCHOPHYSICAL STUDY

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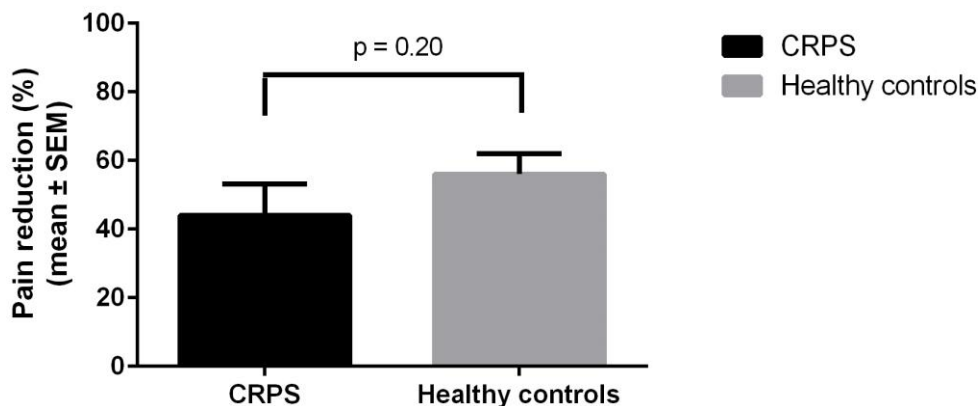
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BACKGROUND AND AIMS: Complex regional pain syndrome (CRPS) is a disabling pain condition characterized by sensory, motor and autonomic disturbances. Some authors have suggested that a deficit in the functional integrity of endogenous pain modulating responses could contribute to the pain experienced by CRPS patients. The aim of the present study was to formally test this hypothesis by comparing the efficacy of conditioned pain modulation (CPM) between a group of CRPS patients and a group of age-matched healthy controls. **METHODS:** Nine patients with CRPS and 10 healthy controls were recruited. Experimental pain was evoked with a 10 cm² thermode (two minutes stimulation), during which subjects were asked to evaluate pain intensity with a computerized visual analog scale. Patients were then asked to immerse their hand in painful cold water for two minutes – a procedure known to activate CPM – after which the thermode stimulation was immediately repeated. **RESULTS:** Analysis of the thermode pain responses obtained before and after immersion revealed that both groups experienced CPM analgesia, with healthy controls showing a 56% reduction in pain and CRPS patients showing a 44% reduction in pain. There was no difference in CPM analgesia between the two groups ($p = 0.20$). **CONCLUSIONS:** The preserved CPM response observed in CRPS individuals suggest that the efficacy of the descending pain inhibitory circuits is preserved in this patient population. Future studies with larger sample size are needed to confirm the present results and to determine if other pain modulating systems could contribute to CRPS pain.



EFIC5-0732

Clinical pain states: Complex regional pain syndromes

OPTIMIZATION AND PHARMACOLOGICAL VALIDATION OF A MODEL OF VISCERAL PAIN INDUCED BY COLORECTAL DISTENSION (CRD) IN THE RAT

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Background and aims: Inflammatory Bowel Disease (IBD) is a chronic, remitting and relapsing inflammatory disorder encompassing Crohn's disease and ulcerative colitis. Trinitrobenzene sulphonic acid (TNBS)-induced colitis remains one of the most common methods used for studying IBD in animal models, although the effects of TNBS to induce pain hypersensitivity can be variable. The aim of the present study was to optimize experimental conditions and to validate the model with phloroglucinol, a non-specific antispasmodic.

Methods: Male rats received rectal instillation of TNBS dissolved in ethanol. Colonic distension was performed after a recovery period of 14 days. Under anesthesia, a latex balloon (probe) was inserted into the rectum and the distal colon. The probe was then filled with increasing volumes of water and the number of abdominal cramps was counted for 4 consecutive 10-minute periods. Phloroglucinol was acutely administered by gavage at the doses of 30, 60 and 100 mg/kg, 60 minutes before the test.

Results: The number of cramps was significantly increased in the vehicle control group sensitized with TNBS as compared to a non-sensitized control group receiving saline only. Phloroglucinol significantly decreased the number of cramps in TNBS-sensitized rats as compared to the vehicle control.

Conclusions: These results suggest that the effects of TNBS were consistent when the cramps were induced by incrementing CRD. The efficacy of phloroglucinol, used in the clinic, suggests that the model has a translational value. Our TNBS-induced colitis model may be particularly useful for evaluating the efficacy of drugs against visceral pain in preclinical studies.

EFIC5-0827

Clinical pain states: Complex regional pain syndromes

A CASE REPORT: CRPS POST FRACTURE

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Background and aims

A 51 year old female patient with no significant medical history has suffered from a left ankle fracture in January 2014. The ankle was immobilized with plaster for 2 weeks and afterwards she did several sessions of physiotherapy and kinetotherapy, but the pain remained.

MRI (February 2014) showed talar edema and fluid collections in the talar and subtalar joints.

The patient has been admitted in our rheumatology service in July 2014 with increasing pain, swelling, warmth and redness in her left ankle. She needed 2 canes to ambulate.

Methods

X-Rays showed patchy osteoporosis, old talus (astragalus) fracture, tibiotarsal and metatarsophalangeal arthrosis. The *musculoskeletal ultrasound* showed no signs of synovial hypertrophy or fluid collections.

We concluded the patient had CRPS type I and started treatment with Bisphosphonates, Calcitonin nasal spray and injections with Dexamethasone. Home treatment included oral and local NSAIDs.

Results

The swelling disappeared, the ankle is paler, the temperature got normal and the osteoporosis improved a little. The patient is able to ambulate without canes. Overall, her symptoms improved except for the pain which remained and has periods of exacerbation.

Conclusions

CRPS is an underdiagnosed condition with no precise treatment that needs a multidisciplinary approach from different specialists and a *patient-focused therapy*. It is very important to prevent immobilization which can worsen the pain and cause stiffness, *muscle atrophy* and tendon retraction. Also, we should keep in mind the psychological impact and the high risk of addiction to pain killer drugs.

EFIC5-0924

Clinical pain states: Complex regional pain syndromes

CHRONIC REGIONAL PAIN SYNDROME POST TRANSRADIAL CARDIAC CATHETERIZATION

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Complex regional pain syndrome (CRPS) can be a difficult disease to diagnose and manage given its complicated and still uncertain pathophysiology. It is characterized by pain, soft tissue and bony changes, and can be extremely debilitating, exerting a huge toll on a patient's emotional and psychological wellbeing. CRPS can be caused by a myriad of conditions ranging from trauma, to surgeries like joint replacements, to medical diseases such as stroke. This is a case report regarding a 54 year old lady, Mdm K who developed CRPS in her right upper limb after a transradial cardiac catheterization was performed. She experienced extreme pain during injection of contrast via the radial cannula, and was subsequently reviewed by the vascular and hand surgeons. She underwent intensive physical therapy along with simple analgesics and gabapentin, with little improvement. By the time she was seen by the pain management team five months later, she was experiencing persistent paraesthesia and pain over her upper limb. She was started on nortriptyline, received a stellate ganglion block and continued her physiotherapy, with improvement in her pain and function.

SPINAL CORD STIMULATION OF THE DORSAL ROOT GANGLION IN CRPS. A NEW HORIZON.

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Complex regional pain syndrome (CRPS) is a disorder characterised by pain, sensory and motor disturbances and represents a significant medical entity, even in children. Early diagnosis, referral and appropriate intervention are essential in decreasing pain, suffering and resorting function for children and adolescents with CRPS.

Case Report:

A 10-years-old girl with past medical history of ankle sprain who developed CRPS. Shown discoloration, edema, erythema, paresthesia and allodynia. A tunneled epidural catheter was implanted, as initial invasive treatment, with neuropathic pain disappearance. But, pain restored in a few weeks after epidural anesthetics infusion ends. After a new failed epidural catheter infusion, she was scheduled for a spinal cord stimulation trial, unsuccessfully after two weeks. Finally, after an early ineffective spinal cord stimulation treatment, a GDR Stimulator was implanted, setting an electrode in L5 root and retrograde S1 root (tetrapolar electrodes). A full recovery was reached in 72 hours with a good spread, paresthesia and pain relief, sustained with independent body position. Conservative medical treatment for neuropathic pain was maintained throughout. GDR is shown as a revolutionary target for neuromodulation therapy.

A COMPREHENSIVE MODEL OF ADJUSTMENT TO PAIN IN THE CO-OCCURRENCE OF PTSD AND CHRONIC MUSCULOSKELETAL PAIN: VULNERABILITY AND PROTECTIVE PATHWAYS

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Background

There are a significant comorbidity between PTSD and chronic pain. Thus, studies clarifying the vulnerability and protective variables and mechanisms associated with PTSD and chronic pain are needed. The aim of this study was to examine the association between trauma, resilience, PTSD symptoms, and the variables included in the fear-avoidance models (anxiety sensitivity, catastrophizing, fear-avoidance beliefs, fear of pain, pain hypervigilance) as well as pain acceptance and experiential avoidance in explaining adjustment to chronic pain (pain intensity, pain-related disability and emotional distress).

Method

The sample consisted of 229 patients with chronic musculoskeletal back pain.

Results

Structural Equation Modelling was used. Statistical tests indicated that the hypothesized model adequately fitted the data (RMSEA = .07; CFI = .99; NNFI = .98; TLI = .96). The χ^2 test was significant ($\chi^2(8) = 19.25$, $\chi^2/df = 2.40$, $p = .014$). The results provided support for the hypothesized model. All the standardized path coefficients were significant ($p < .05$).

Conclusions

This study provides empirical support for the potential role of PTSD symptoms in fear-avoidance models of chronic pain, and may provide support for the diathesis-stress model of pain. It is the first comprehensive model of adjustment to pain to consider vulnerability and protective adaptation mechanisms in patients who have undergone a traumatic event. The study highlights the importance of a comprehensive framework of reference to understand the comorbidity of PTSD and chronic musculoskeletal pain, and the need to provide well-designed treatment programs for the simultaneous treatment of these conditions.

EFIC5-0474

Human behavioural science: Endurance-avoidance

PAIN AND DISABILITY IN PATIENTS WITH CHRONIC BACK PAIN DURING EXERCISE TREATMENT: THE ROLE OF SUBGROUPS BASED ON THE AVOIDANCE-ENDURANCE-MODEL

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Background/Aims

Patients with high fear-avoidance (FAR) as well as high endurance responses (distress-endurance DER, eustress-endurance EER) to subacute low back pain have been shown to benefit less from primary care or from surgery than patients with an adaptive response pattern (AR). However, little is known about possible subgroup differences during exercise treatment.

Methods

104 patients suffering from chronic back pain (> 3 months) completed the Avoidance-Endurance-Questionnaire (AEQ), the Beck Depression Inventory for Primary Care (BDI-PC), the Von Korff Disability Scale (DS) and rated average pain intensity on a 0-10 numerical rating scale during the first weeks of exercise treatment (T0). 65 patients further completed outcome measures 6 months later (T1). A repeated-measures analysis of variance was computed to calculate main effects for AEM-subgroup (FAR, DER, EER, AR) and within-group variance for time (T0,T1).

Results

Regarding pain intensity, the results revealed a significant time effect ($p < .05$) indicating an overall decrease of pain. Further, we found a significant group effect ($p < .05$) with DER patients displaying significantly higher scores compared to EER and AR patients. Concerning disability, a significant group effect ($p < .001$) occurred with DER showing higher scores at both assessment times compared to all other subgroups. Interestingly, FAR and the EER patients showed low pain and disability levels, both comparable to AR patients.

Conclusions

Although the study provides evidence that exercise treatment reduces pain in all patients, DER patients remain to be a problematic group in this setting. By contrast, FAR and EER patients may particularly benefit from exercise treatment.

MEASURING OLDER ADULTS' PREFERENCES FOR SUPPORT OF AUTONOMY AND DEPENDENCE IN PAIN: DEVELOPMENT AND VALIDATION OF A SCALE

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Background & Aims: Chronic pain (CP) among older adults is common and often disabling (Reyes-Gibby et al., 2002). Pain-related formal social support, and the extent to which it promotes functional autonomy or dependence, plays a significant role in the promotion of older adults' ability to engage in their daily activities; recent studies show that higher/lower pain disability is, respectively, associated with higher perceived promotion of dependence/autonomy (Matos et al., 2015). The strength of this relationship, however, may depend on the extent to which older adults prefer receiving pain-related support for autonomy/dependence (Maisel & Gable, 2012). Therefore, we aimed at developing and validating a scale of older adults' Preferences for Formal Social Support of Autonomy and Dependence in pain (FSSADI_PAIN_P).

Methods: 170 older adults with CP ($M_{age}=78.3$, 67.6% women), recruited from day-care centers and nursing homes in Lisbon, completed the FSSADI_PAIN_P and a measure of desire for (in)dependence (Nagurney et al., 2004).

Results: Confirmatory factor analyses showed an excellent fit to the hypothesized structure of two correlated factors ($r= .53$): 1) Preference for autonomy support (PAS; $n=3$ items; $\alpha=.98$); 2) preference of dependence support (PDS; $n= 3$ items; $\alpha=.82$). The scale also showed good criterion validity; the higher the desire for independence the lower the PDS ($r=-.37$) and the higher the desire for dependence the higher the PDS ($r=.36$).

Conclusion: The FSSADI_PAIN_P is an innovative and reliable tool, which may contribute to explore the role of pain-related social support responsiveness on the promotion of older adults' functional autonomy when in pain.

EFIC5-0497

Human behavioural science: Endurance-avoidance

PHYSICAL FUNCTIONING AS A MEDIATOR OF THE RELATIONSHIP BETWEEN PERCEIVED SOCIAL SUPPORT FOR AUTONOMY/DEPENDENCE ON ELDER'S PAIN-RELATED DISABILITY

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Background and Aims: Chronic pain (CP) is prevalent among elders and usually associated with high functional disability (Helme & Gibson, 1997). Perceived promotion of autonomy (PPA) and dependence (PPD), as functions of perceived social support, influences pain experiences (Matos & Bernardes, 2013). Since little is known about such underlying processes we aimed to explore the mediating role of physical functioning in the relationship between PPA/PPD and pain-related disability, among older adults with CP.

Methods: 118 elders (Mage=82) with CP filled the Formal Social Support for Autonomy and Dependence in Pain Inventory (Matos & Bernardes, 2013), the Brief Pain Inventory (Cleeland, 1989) and the Physical Functioning sub-scale of the MOS-SF36 Health Survey (Ware & Sherbourne, 1992).

Results: Physical functioning partially mediated the relationship between PPA/PPD and pain-related disability. Higher PPA predicted lower pain-related disability and part of this effect was accounted for by physical functioning ($B = -.767$, $p < .001$ decreased to $B' = -.485$, $p < .01$). Higher PPD predicted higher pain-related disability and part of this effect was also accounted for by physical functioning ($B = .889$, $p < .01$ decreased to $B' = .597$, $p < .05$).

Conclusions: These results highlight the importance of considering the functions of PPA/PPD in managing elders' CP experiences.

EFIC5-0670

Human behavioural science: Endurance-avoidance

PAIN-COGNITION INTERACTION: PAIN-RELATED ENDURANCE MODULATES PAIN SENSITIVITY AND COGNITIVE PERFORMANCE IN A DOUBLE-TASK PARADIGM

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Background/Aims

Pain captures attention and cognitive distraction may reduce pain sensitivity. The interaction between pain experience and cognitive performance represents a complex phenomenon that is dependent from stimulus conditions as well as from trait variables. The avoidance-endurance-model of pain (AEM) suggests that pain-related endurance coping, i.e. pain persistence behavior, may reduce attentional load and decrease pain sensitivity in order to improve performance.

Methods

90 healthy volunteers participated in a randomized experimental design using a double-task paradigm. To assess the impact of pain on cognitive performance, two cognitive task conditions (Cold-pressor-test vs. warm water control while working on a 2-back test) were compared. To assess the impact of cognitive load on pain sensitivity, two pain conditions (Cold-pressor-test while working on a 2-back test vs CPT alone) were compared. Two-way ANOVAs were computed to analyse pain sensitivity and cognitive performance, using SPSS-22.

Results

Concerning cognitive performance, results indicated a main effect of endurance ($p < .05$) with better recall in high endurance individuals. The main effect for pain or pain x ER interaction term were not significant. Concerning pain sensitivity, we found a marginal significant task x ER interaction ($p = .06$) with lower pain intensity in high ER individuals under CPT alone compared to CPT+2-back. Pain tolerance was increased in high ER men only.

Conclusions

The findings indicate that pain-related endurance may increase cognitive performance and decrease pain sensitivity under conditions where pain and cognitive load interact simultaneously. Research is warranted to explore the impact of endurance on cognitive performance in daily life.

EFIC5-0042

Pain treatment (conservative): Acute pain / perioperative pain – Other

EFFECT OF THE ANTIPLATELET, CLOPIDOGREL, WHICH ANTAGONIZES ATP-P2Y₁₂ RECEPTOR, ON POSTOPERATIVE PAIN

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[Background]

Clopidogrel [CLP] demonstrates an anti-platelet effect, by inhibiting the P2Y₁₂ receptor which is one of the ATP receptors. The P2Y₁₂ receptors express in not only platelets but also spinal microglia. The P2Y₁₂ receptor regulates microglial activation which causes pain persistence and aggravation in both neuropathic and nociceptive pain models. Short-term cessation of CLP can lead to rebound platelet action. Here, we investigate whether cessation of CLP influences postoperative pain.

[Methods]

Forty-six surgical patients, who had been administered but ceased CLP, were enrolled retrospectively. They were divided in two groups based on the CLP cessation period: One is, within 14 days (short-group, N=34) and the other is, more than 15 days (long-group, N=12). In both groups, the amounts of opioids and NSAIDs consumption for controlling postoperative pain with manageable bounds were compared by using the chi-square test and the Mann-Whitney test.

[Results]

Opioid was a standard postoperative analgesia in both groups (long, N=10; short, N=19; p=0.18). More short-group patients used NSAIDs (long, N=11; short, N=18; p<0.05). Opioids consumption within 2 weeks after surgery in the long-group (fentanyl-equivalent dose 800+/-958mcg; mean+/-SD) was marginally more than the short-group (360+/-657mcg) (p = 0.09).

[Discussion]

Rebound pain aggravation effect by short-term CLP cessation was not observed, and rather long-term CLP cessation indicated it. Antagonizing the P2Y₁₂ receptor by CLP might continue for more than 14 days. The present findings suggest that the P2Y₁₂ receptor possibly engages in signal transduction of postoperative nociceptive pain and enhancement of opioid analgesia.

EFIC5-0140

Pain treatment (conservative): Acute pain / perioperative pain – Other

PROLONGED CONTINUOUS THETA-BURST STIMULATION IS MORE ANALGESIC THAN 'CLASSICAL' HIGH FREQUENCY REPETITIVE TRANSCRANIAL STIMULATION

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Background and aims: Repetitive transcranial magnetic stimulation (rTMS) of the primary motor cortex (M1) at high frequency (> 5Hz) induces analgesic effects, probably by activating pain modulation systems. A new rTMS paradigm - theta burst stimulation (TBS) - consists of bursts of three pulses at 50 Hz repeated five times per second. Like high frequency rTMS, both intermittent and prolonged continuous TBS (iTBS and pcTBS) lead to a facilitation of cortical excitability. The aims were (1) to evaluate the analgesic effects of neuronavigated iTBS and pcTBS, comparing them with those of classical high frequency rTMS over the left M1, (2) to elucidate the role of conditioned pain modulation (CPM) in the antinociceptive effect of rTMS and (3) to investigate possible correlations between analgesia and cortical excitability.

Methods: Fourteen healthy volunteers participated in four experimental sessions, carried out in a random order (iTBS, pcTBS, 10 Hz rTMS or sham). Cold pain threshold, CPM and cortical excitability measurements were carried out before and after rTMS.

Results: 10 Hz rTMS and pcTBS were significantly superior to sham rTMS for the induction of cold analgesia. Moreover, pcTBS was significantly more effective than 10Hz rTMS ($p=0.026$). Analgesia did not seem to be driven by changes in CPM or cortical excitability.

Conclusion: Prolonged cTBS has considerable clinical potential, as it has a shorter treatment duration (by a factor 8) and stronger analgesic effects than the classical high frequency protocol. Studies in patients are required to confirm the potential of this new stimulation paradigm for clinical applications.

EFFECTS OF EPIDURAL MAGNESIUM ON ANALGESIC REQUIREMENTS IN PATIENTS UNDERGOING THORACOTOMY PROCEDURE

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Background: Thoracic surgery is associated with high level of painful stimuli. Magnesium has antinociceptive effects in animal and human models of pain. The goal of this randomized prospective study was to assess the effects of continuous epidural magnesium infusion during thoracic surgery procedure on the intraoperative sufentanil consumption and postoperative analgesic requirements during first 48 hours after surgery.

Methods: Seventy patients were randomized into two groups of 35 patients: Group 1 (magnesium group) received epidural 10% magnesium sulphate (MgSO₄) along with anesthetic drugs and Group 2 (control group) received 0.9% NaCl solution along with anesthetic drugs intraoperatively. Postoperatively Group 1 were administered epidural 10% MgSO₄ in addition to local anesthetic and opioid whereas Group 2 were administered local anesthetic and opioid alone. Primary outcomes of the study were to determine cumulative doses of intraoperatively administered opioid and cumulative doses of opioid and local anesthetic administered during 48 hours postoperatively.

Results: The cumulative dose of opioid sufentanil required intraoperatively was significantly lower in Group 1 43.00 µcg versus 56.3µcg in Group 2 (p = 0.001). Cumulative epidural dose of opioid sufentanil during 48 hours was significantly lower in Group 1 (208.22µcg versus 341.25µcg (p=0.001)). Cumulative epidural dose of local anesthetic was significantly lower in Group 1. VAS scores measured every 4 hours at rest and movement during first 48 hours postoperatively were significantly lower at all measured intervals in the magnesium group.

Conclusion: We can conclude that adding magnesium to epidural mixture led to more efficient intra- and postoperative analgesia.

PATIENTS' FEAR AND POSTOPERATIVE PAIN AFTER DAY-CASE SURGERY

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Background and Objective: It is well known that many patients experience moderate to severe pain after day-case surgery. The aim of the study is to identify patient characteristics that may be predictive of postoperative pain.

Methodology: After Ethical Committee approval, 180 patients undergoing day-case surgery were prospectively included in our study. Patients' fear was measured using a 8-item surgical fear questionnaire (SFQ) in the preoperative period. Pain intensity was recorded using a visual analogue scale (VAS) before and after surgery. Pain was defined as VAS above 30 mm. For 3 days, patients were asked to record their pain intensity, analgesics intake and side effects, i.e. nausea and vomiting (PONV). We used Pearson Correlation with $p < 0.05$ as significant.

Results: 149 questionnaires were correctly filled in (70% females, 30% males). Most prominent were gynecological (41%) and orthopedic (29%) surgery. Total anesthesia was performed for 86%. Before surgery, 22% indicated pain with VAS-scores >30 mm. On the day of operation, 58% of the patients had mean VAS-scores >30 mm, day 1(D1) 48%, D2 32% and D3 30%. Preoperative patients' fear was positively correlated with the 3 days postoperative pain scores ($p < 0.01$). 81% received none or only one analgesic drug. Only 6 patients suffered of PONV.

Conclusion: The study showed that many patients still experience moderate to severe pain in the early postoperative period after day-case surgery. We observed a clear relationship between surgical fear and postoperative pain. Measures to reduce patients' fear may be important to decrease postoperative pain.

EFIC5-0366

Pain treatment (conservative): Acute pain / perioperative pain – Other

PERIOPERATIVE ANALGESIA ON CESAREAN DELIVERY IN WOMEN WITH HEART DISEASE

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Background and aims

Pregnant with heart disease in cesarean delivery is a high-risk due to the overlapping of the hemodynamic changes of pregnancy on already impaired function of the heart.

The aim of this study was to analyze the impact of analgesia on hemodynamic during cesarean section in patients with heart disease and propose anesthetic technique that provides safety for mother and fetus, avoidance of myocardial depression and maintain a stable hemodynamic, maintain prevention of increased ventricular afterload.

Methods

Eighty-two patients with heart disease undergoing elective cesarean deliveries were administered either epidural anesthesia with incremental doses of ropivacaine 0,5% or combined spinal-epidural anesthesia using epidural volume extension (CSE) comprising intrathecal hyperbaric 0.5% bupivacaine 5 mg with fentanyl 25 mcg, followed by 0.9% saline 8 ml through the epidural catheter immediately the intrathecal injection. Hemodynamic parameters and block characteristics were assessed.

Results

Epidural volume extension (EVE) via a combined spinal-epidural technique preserves maternal hemodynamic stability with equally effective anesthesia. Visual analogue scale, incidence of maternal side effects and ephedrine dose requirement were similar in the groups.

Conclusions

Our multidisciplinary team considers that this technique- epidural volume extension, has many benefits for cesarean delivery in patients with heart diseases.

DEX-TRA-05: RANDOMISED CLINICAL TRIAL TO EVALUATE AN ORAL DEXKETOPROFEN/TRAMADOL COMBINATION FOR TREATMENT OF MODERATE-TO-SEVERE ACUTE PAIN AFTER TOTAL HIP ARTHROPLASTY.

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Background and aims. To confirm the superiority of dextketoprofen/tramadol 25mg/75mg fixed-dose combination in the treatment of moderate-to-severe acute pain following primary total hip arthroplasty over its single components, dextketoprofen (25mg) and tramadol (100mg).

Methods. Randomised, double-blind, placebo- and active-controlled, parallel-group, phase III in patients experiencing pain at rest of at least moderate intensity on day after surgery (after cessation of postoperative analgesic care). Patients received the study drug every 8 hours, up to 13 doses over a 5-day period. Placebo was included at the single-dose phase to validate the pain model; rescue medication (RM, metamizole 500mg) was available during treatment period. Analgesic efficacy evaluation was based on patient assessments of pain intensity, pain relief, and patient global evaluation at different time-points, and use of RM. Primary endpoint was the mean sum of the pain intensity difference values over 8 hours (SPID₈).

Results. 641 patients, mean age 61.9 (SD: 9.96), were randomised. SPID₈ in the dextketoprofen/tramadol group [246.9 (156.50)] was statistically superior to dextketoprofen [208.8 (154.69), p=0.019], and tramadol [204.6 (145.79), p=0.012]. Single components were statistically superior to placebo confirming model sensitivity. Secondary endpoints generally supported fixed-dose combination efficacy over single and multiple-doses.

Most common adverse drug reactions (ADR) were nausea (0.9%) and vomiting (0.6%), all ADRs on active-treatment occurred in less than 2% of patients overall.

Conclusions. Efficacy results confirmed the superiority of dextketoprofen/tramadol over its single components, even at higher doses (tramadol) with an optimal safety profile, thus supporting its potential role in moderate-to-severe acute pain management.

PAIN MANAGEMENT AFTER SURGICAL OPERATIONS, THE DIFFERENCE OF USE DICLOFENAC VS. TRAMADOL

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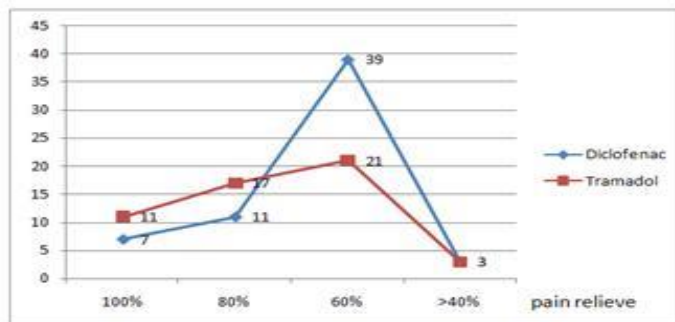
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Background and aims: Postoperative pain is common in recovery room after surgical operations. The aim of this study was to compare the postoperative use of diclofenac versus tramadol at patients undergoing cholecystectomy laparoscopica operations.

Methods: The surgical department of regional hospital in Prizren has 55 beds. Data was collected using International Pain Outcomes questionnaire and medical documentations where are prescribed analgesics. Patients were divided in two groups (group A n=60 using diclofenac 75mg, and group B n=60 using tramadol 100mg).

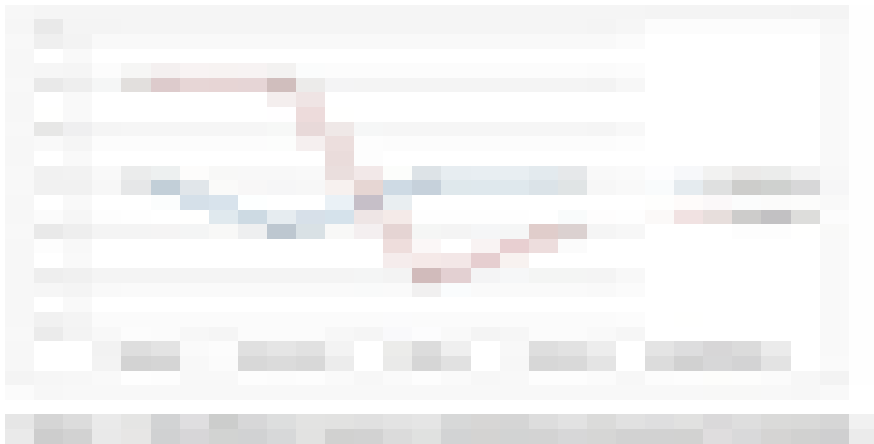
Results: Findings were obtained from 120 general surgery patients on the first day after surgery undergoing laparoscopic cholecystectomy, during November 20, 2014 – February 20, 2015. According to findings the use of tramadol was generally most effective (Graph 1) while there was a higher incidence of postoperative nausea (Graph 2).

Conclusions: The effect of analgesia was better using tramadol according to patients' reports, but there was higher incidence of postoperative nausea. Plans to optimize management of pain will be developed.



Graph. 1. Comparison between group A (diclofenac) and group B (tramadol) to pain relieve percentages.

Chart Area



EFIC5-0650

Pain treatment (conservative): Acute pain / perioperative pain – Other

EFFECT OF PREOPERATIVE INTRAVENOUS VITAMIN C ON POSTOPERATIVE PAIN AND MORPHINE USE AFTER LAPAROSCOPIC COLECTOMY: A RANDOMIZED CONTROLLED TRIAL, PRELIMINARY REPORT.

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Background and aims

Vitamin C is a water-soluble vitamin. It is necessary for normal growth and development. Vitamin C also has antioxidant, neuroprotective and neuromodulating effect. Clinical studies have shown that supplementation of vitamin C might play a role in pain treatment without any significant side effects. However, we were interested in evaluating the role of high dose vitamin C in reducing postoperative pain. So we designed a randomized placebo-controlled trial to assess the role of a single prophylactic dose of intravenous vitamin C (50mg/kg) in reducing the consumption of opioids during the first 24hr in patients undergoing laparoscopic cholecystectomy. Pain intensity and side effects were analyzed as secondary outcomes.

Methods

Sixty adults patients were allocated to receive 50mg/kg vitamin C i.v. or placebo just after induction of anesthesia. Following laparoscopic colectomy, patients received morphine patient-controlled analgesia. Morphine consumption, verbal numerical rating scale scores for pain and fatigue and incidence of nausea/vomiting were assessed at postoperative care unit, two, six and 24hr.

Results

Pain scores during rest was significantly lower in the vitamin C group vs the placebo group at 2, 6 and 24hr. There was no difference in morphine consumption in the postoperative period between the two groups. There was no difference in pain scores during cough or side effects between the two groups. Fatigue score were similar in both groups.

Conclusions

Our study showed that supplementation with vitamin C 50mg/kg i.v. decreased pain score at rest in the first 24h postoperative period in patients undergoing laparoscopic colectomy.

EFIC5-0655

Pain treatment (conservative): Acute pain / perioperative pain – Other

REDUCTION IN HOSPITALISATION BY 27% AFTER THE INTRODUCTION OF A NEW MULTIMODAL PRE-OPERATIVE MEDICATION

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Background and aims:

Optimization of perioperative outcome can be achieved by improvements in a number of steps during the course of treatment, thus attaining a more effective regime without deterioration of the quality.

More focus on solving these tasks is central in order to meet the growing demands for faster and more effective treatments within the given financial framework.

Here, we introduce a new multimodal analgesic technique as one of a number of steps towards improvements in the perioperative period.

Methods:

A review of the literature for evidence-based interventions and consequential implementation of a new preoperative multimodal analgesic medication.

Based on well-documented results we chose

Paracetamol 2 g

Celecoxib 400 mg

Dexamethasone 8 mg (when major surgery: 16 mg)

PreOp drink 200 ml

Length of stay in the orthopaedic department in the period 24 months before the introduction of the new preoperative medication was compared with the period 24 months after.

Results:

During the period a total of 5717 adult patients were treated. Of these 2732 were treated before and 2986 after the intervention.

After the introduction of the new preoperative medication we saw a reduction in the average hospital stay from 3.18 days to 2.32 days.

Conclusions:

Implementation of results from validated research within preoperative medication improves quality in treatment and reduces the hospital stay.

POOLED DATA OF RANDOMISED TRIALS OF DEXKETOPROFEN/TRAMADOL ON MODERATE-TO-SEVERE ACUTE PAIN: THE ANALGESIC EFFICACY BY 8-HOUR TOTPAR

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Aim of Investigation: The analgesic efficacy of dexketoprofen/tramadol versus the single components was assessed by means of the total pain relief (TOTPAR) over 8 hours using pooled data from randomised trials allowing analyses by well-sized subgroups, such as severe pain.

Methods: Data were pooled from three randomised, double-blind studies on three different models of moderate-to-severe acute pain (impacted third molar extraction, major abdominal and major orthopaedic surgery) including a total of 1486 patients with pain intensity ≥ 40 on a 0-100 visual-analogue scale (VAS). TOTPAR over 8 hours was calculated for dexketoprofen/tramadol (25mg/75mg), dexketoprofen (25mg), tramadol (75mg or 100mg) and placebo as the time-weighted sum of the PAR scores, according to a 5-point VRS (0=none, 1=slight, 2=moderate, 3=good, 4=complete) overall and by baseline pain intensity (PI-VAS) subgroups.

Results: The analysis of TOTPAR over 8 hours clearly showed the superiority of the combination versus the single agents (17.2 [mean] ± 7.0 [SD] versus 15.1 ± 7.1 and 13.5 ± 8.0 , respectively; $p \leq 0.0001$). In addition, model sensitivity was confirmed by the superiority of dexketoprofen and tramadol versus placebo (p60) (16.8 ± 6.8 ; $p < 0.05$).

Conclusions: The pooled analysis of TOTPAR provided additional evidence of the superiority of dexketoprofen/tramadol over the single components in the management of moderate-to-severe acute pain, including very severe pain.

EFIC5-0740

Pain treatment (conservative): Acute pain / perioperative pain – Other

DEXKETOPROFEN/TRAMADOL COMBINATION ANALGESIC EFFICACY EVALUATED THROUGH THE USE OF RESCUE MEDICATION IN COMPARISON TO DEXKETOPROFEN, TRAMADOL, AND PLACEBO.

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Background and aims. Moderate-to-severe pain often requires a multimodal analgesia which can be obtained by combining agents with different mode of action to optimise the efficacy (and possibly lower the dose of single components) and avoid/minimise the use of rescue medication. The necessity of rescue medication is therefore an important parameter to be considered along the assessment of analgesia.

Methods. This is a pooled analysis of data collected in two randomized, double-blind, placebo- and active-controlled, parallel-group, phase III studies testing dexketoprofen/tramadol 25mg/75mg fixed-dose combination versus dexketoprofen 25mg, tramadol 100mg and placebo in relief of visceral and somatic pain. The use of rescue medication was registered during the first 8 hour dose interval after the 1st administration.

Results. Overall 1247 patients, mean age 55 (SD: 11), were randomized as follows: 311 to dexketoprofen/tramadol; 312 to dexketoprofen; 310 to tramadol; and 314 to placebo. The groups were comparable in terms of patient characteristics and baseline data. The percentage of patients in need of rescue medication was significantly lower in the dexketoprofen/tramadol group [8.7% (27 patients)] than in dexketoprofen group [15% (48), $P=0.010$] and tramadol group [18% (56), $P=0.0006$]. The lower use in the active treatments, dexketoprofen and tramadol, than placebo confirmed the model sensitivity [32% (99), $P< 0.0001$].

Conclusions. Patients treated with dexketoprofen/tramadol showed a significant lower use of rescue medication for relief of postoperative moderate-to-severe acute pain, thus confirming its superiority versus the single agents in achieving adequate analgesia

EFIC5-0757

Pain treatment (conservative): Acute pain / perioperative pain – Other

PRACTICE OF PAIN MANAGEMENT BY INDIAN HEALTHCARE PRACTITIONERS: RESULTS OF A PAPER BASED QUESTIONNAIRE SURVEY

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Background and Aims: Pain is the most common reason for patient's visit to the doctor. In India, different NSAIDs and opioids are used as monotherapy and in combination for management of pain. This survey was undertaken to evaluate attributes for selection and usage pattern of analgesics by Indian healthcare practitioners (HCPs).

Material and methods: A cross-sectional, observational paper based questionnaire survey among 448 HCPs [general practitioners (GPs), consulting-physicians (CPs), dentists, orthopedicians, general-surgeons and neurologists] was undertaken

Results:

Attributes for selecting Opioids

Attributes	Specialty			
	GPs	CPs	Dentists	Surgeons
Patients age	72.80%	87.50%	74.44%	78.90%
Duration of Therapy	70.80%	69.64%	66.17%	73.60%
Comorbid conditions	62.13%	92.80%	69.17%	-
Frequency of Dosing	52.40%	64.20%	54.14%	78.90%

Attributes for selecting NSAIDs

Attributes	Specialty		
	GPs	Dentists	Surgeons
Patients age	77.60%	66.91%	84.20%
Duration of Therapy	59.20%	48.87%	73.60%
Comorbid conditions	70.80%	42.86%	-
Severity of pain	60.10%	58.65%	78.90%

Drug of choice based on severity of pain:

For mild pain, paracetamol was choice of analgesics according to 77%GPs, 78.57%CPs and 74% of surgeons.

For moderate pain 77% GPs, 87.50% CPs, 68% surgeons and 80.30% orthopedicians reported use of paracetamol-tramadol combination whereas NSAID-paracetamol and paracetamol-diclofenac was used by 68.94% and 47.73% orthopedicians respectively.

Conclusion: Patient's age, duration of therapy, comorbid conditions, frequency of dosing and severity of pain are useful in selecting analgesics. Paracetamol and its combination are commonly used in management of mild and moderate pain respectively.

EFIC5-0803

Pain treatment (conservative): Acute pain / perioperative pain – Other

PATIENT INVOLVEMENT IN PAIN MANAGEMENT AT ACUTE ABDOMINAL PAIN

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Background and aims

Patients with acute abdominal pain experience insufficient pain management during hospital admission. The aim of this study was to investigate how patient administered analgesics affected pain intensity and use of analgesics.

Methods

A before-and-after study is performed. The control group receive usual care with nurses controlling analgesics. In the intervention group, the patients controlled perorally and suppository administered analgesics, and nurses administered analgesics given as injection. Evaluation will be performed by medical file review with collection of following data: demographic data, diagnosis, type of surgery, pain intensity score, type, amount and route of administered analgesics, and type and amount of antiemetic.

Results

A successful pilot-study has been conducted. In total, 200 patients will be included and randomized into the two different treatment groups. Inclusion started in December 2014 and will be closed June 2015.

Conclusions

The study will provide knowledge about how patient involvement in pain management affects pain intensity and use of analgesic during hospital admission for patients with acute abdominal pain.

Acknowledgements

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THE EFFECTS OF A NONPHARMACOLOGICAL PAIN PROTOCOL FOLLOWING CARDIAC SURGERY

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Background and aim: Post-operative cervical, dorsal and lumbar pain are frequent complaints after cardiac surgery and impact on patients' well-being and recovery. A number of nonpharmacological approaches such as massage and heat have been shown to reduce pain.

The aim of this study was to identify the effects of a nonpharmacological pain management protocol on pain intensity, perception of relief and feelings in patients following cardiac surgery.

Methods: A consecutive sample of 90 adult patients submitted at least 72 hours earlier to cardiac surgery with sternotomy was recruited in a Portuguese university hospital. Patients in pain received a nursing pain management protocol consisting of environment management, heat, massage and positioning. No changes were made to their pain medication protocol.

Results: Most patients were on postoperative day 4. Dorsal pain was present in 70% of the patients, cervical pain in 54.4% and lumbar pain in 45.6%. After the intervention, maximum pain intensity on the VAS reduced from 10 to 5.8. Mean pain intensity was significantly reduced from 5.42 ± 1.6 to 1.82 ± 1.3 ($p < 0.001$). Mean difference was 3.6, 95% CI [3.28-3.92].

The perception was of "total relief" in 24.4% of the patients and "great relief" in 60%, and 80% of the patients required no rescue analgesia immediately after the intervention. The descriptors of patients' feelings most frequently used were "well-being", "peacefulness" and "comfort".

Conclusions: This nonpharmacological protocol reduces pain intensity and promotes patients' perception of relief and positive emotional states. Nurses should be encouraged to use it in addition to other pain management interventions.

EFIC5-0881

Pain treatment (conservative): Acute pain / perioperative pain – Other

INTRAVENOUS VERSUS EPIDURAL ANALGESIA IN POSTOPERATIVE PAIN TREATMENT OF COLECTOMY.

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Background and aims

The aims of this study was to evaluate the efficacy, safety and acceptability of intravenous analgesia compared with epidural analgesia in postoperative pain colectomy.

Methods

A prospective quasi-experimental study in a cohort of 182 patients (P) underwent colectomy by laparotomy. We compared two groups: intravenous analgesia (GIV): 65 P and epidural analgesia (GEPI): 117 P. All patients were diagnosed with cancer colon. Mean age +/- ST was: GIV 65 +/- 1.6; GEPI 67 +/- 1. We value: type of analgesia, dynamic and resting pain using visual analog scale (VAS), satisfaction (0-10), mean stay in acute pain unit (APU) and side effects. Statistical test: Comparison of two means, Chi-square test, Fisher exact test. Statistical significance: $p < 0.05$. Statistical package SPSS v.18

Results

Both groups were similar in age. Analgesics used in GIV: tramadol+metamizol (36%), tramadol+dexketoprofen (23%), metamizol+paracetamol (24%), metamizol+morphine (18%); Analgesics used in GEPI: levobupivacaine+fentanyl (92%). VAS dynamics on the first day: GIV: 3.3 ± 0.39 ; GEPI: 2.68 ± 0.1 ($p = 0.01$), VAS resting on the first day: GIV 1.4 ± 0.19 ; GEPI: 1 ± 0.1 ($p = 0.02$), mean time stay in APU: GIV: 3.78 ± 0.15 days; GEPI: 3.94 ± 0.1 days ($p = 0.38$). Satisfaction: GIV: 8.91 ± 0.1 ; GEPI: 9.08 ± 0.08 ($p = 0.2$). Side effects: vomiting: GIV/GEPI (1P/1P) ($p = 1$), sedation: GIV/GEPI (61P/113P) ($p = 0.37$), partial motor block: GIV/GEPI (1P/9P) ($p = 0.2$) and constipation: GIV/GEPI (21P/18P).

Conclusions

Epidural analgesia has been more effective than intravenous analgesia, with a high degree of satisfaction of patients. The mean stay in APU was higher in GEPI but not statistically significant. We did not find statistically significant difference in side effects between both groups.

INTRAARTICULAR MAGNESIUM-LEVOBUPIVACAINE COMBINATION FOR PAIN CONTROL AFTER ARTHROSCOPIC MENISECTOMY

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Background and Aim: The aim of this study was to compare the analgesic effects of intra-articular levobupivacaine with levobupivacaine plus magnesium for postoperative pain control.

Methods: In this prospective randomized, double-blind study 96 ASA I-II patients who underwent elective meniscectomy were randomized to 3 equal groups: Group LM patients had 50 mg levobupivacaine+1 gr magnesium sulfate, Group L patients 100 mg levobupivacaine in 20 ml saline and patients in the control group had intra-articular normal saline 20 ml. postoperative analgesia was provided with iv PCA with tramadol (10 mg bolus, 10 minute lockout without basal infusion). Postoperative analgesic consumption was noted and VAS was evaluated both at rest and with mobilization at 0. 1. 2. 4. 6. 8. 12. 24. postoperative hours. Intramuscular diclofenac sodium 75 mg was used as a rescue analgesic. Postoperative adverse effects were noted. VAS values among the groups were compared with Kruskal Wallis test, postoperative tramadol consumption with One-way ANOVA test, rescue analgesic consumption need and side effects were compared with Pearson chi-square and Fisher's exact test. A p value of < 0.05 was considered statistically significant.

Results: Demographic data were similar among the groups. VAS scores both at rest ($p < 0.05$) and during mobilization ($p < 0.05$), analgesic consumptions ($p < 0.01$) and rescue analgesic need was significantly low in mixture group (ML) compared to groups L and control.

Conclusions: This study demonstrates that levobupivacaine-magnesium mixture significantly decreased postoperative analgesic consumption, provided better pain control and early mobilization compared with either levobupivacaine alone or control groups.

EFIC5-1077

Pain treatment (conservative): Acute pain / perioperative pain – Other

PAIN - ALERT OF COMPLICATIONS: RETROSPECTIVE ANALYSIS OF PAIN MANAGEMENT AFTER LAPAROSCOPIC GASTRIC BYPASS SURGERY (LGBS)

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The aim of this study was to conduct a retrospective analysis of postoperative analgesia after LGBS.

Methods:

68 patients, 56 women and 12 men, (29-62 years) with a BMI 40-63 Kg /m², who had LGBS during 2012-2013. Anesthesia: sevoflurane or propofol/fentanyl with atracurium. All did not have a history of chronic pain, had ASA II-III

Postoperative analgesia (PA): 1 g Paracetamol 4 times per day in combination with NSAID (63). 5 patients had contraindications of NSAID. Opioids prescribed an "on demand". First day: meperidin 25 mg intravenously; second day - oral tramadol 50-100 mg. PA was adequate in all patients: 10-point VAS $\leq$ 3.

9 patients had no need for opioids. 7 patients need for meperidin two day. Need of tramadol: 23 patients: one day - 16; 2 day - 4; 3 day - 2 ; 4 day - 1. Doses of opioids varied extremely widely and were not associated with BMI.

Two patients required repeated surgery: they are needed much more opioids, other than patients.

The most common complication: PONV (57.4%).

Results:

The method allows to achieve adequate PA for all patients, to take into account their individual characteristics and needs.

Pain intensity and the need of opioids for the first day is associated with the individual sensitivity of patient's.

The presence of severe pain in the second and subsequent days after surgery may indicate surgical complication

Conclusions:

Monitoring the dynamics of pain will allow to suspect the presence of surgical complications at an early stage.

MIGRAINE FREQUENCY IS ASSOCIATED WITH SEVERITY TEMPOMANDIBULAR DISORDERS

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Background and aims: Although temporomandibular disorders (TMD) and migraine are comorbid, the influence of migraine features on TMD clinical manifestations has not been explored. Herein we investigated the associations between migraine frequency and TMD severity. **Methods:** Our sample consisted of 31 patients with episodic migraine (EM, mean age: 33; SD: 11 years), 21 patients with chronic migraine (CM, mean age: 35; SD: 10), and 32 healthy controls (age: 31; SD: 9). Migraine was diagnosed by experienced neurologists according to the International Classification of Headache Disorders (ICHD-II). Severity of TMD signs and symptoms were assessed by the Fonseca's anamnestic index and classified as follows: no TMD (0-15points); mild TMD (20-40), moderate TMD (45-60), and severe TMD (70-100). **Results:** The mean frequency of EM attacks was 5.9/month (SD: 3.7); for CM it was 20.7 (SD: 6.2). Both EM and CM patients were more likely to have TMD of any severity relative to healthy controls. Individuals with CM were more severely affected than EM (**Fig. 1**). CM patients also had an increased risk of having more severe manifestations of TMD than healthy controls (OR: 3.31), and this association was not seen for EM (**Table 1**). **Conclusion:** Migraine frequency is associated with TMD severity.

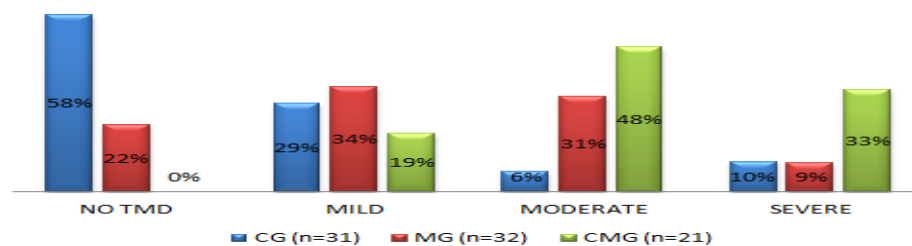


Figure 1. Frequency distribution of TMD signs and symptoms' severity according to Fonseca's Anamnestic Index.

Table 1. Severity of TMD as a function of headache status.

	No TMD + Mild		Moderate + Severe	
	PR	95%CI	PR	95%CI
Healthy controls	Reference		Reference	
Episodic migraine	0.80	0.51-1.27	2.18	0.85-5.56
Chronic migraine	0.34*	0.14-0.89	3.31*	1.36-8.05

PR: prevalence ratio; 95%CI: 95% confidence interval /* $P < 0.05$

EFIC5-0032

Clinical pain states: Headache (Migraine)

RADIOLOGICAL ANALYSIS OF THE CRANIO-CERVICAL CURVATURES IN MIGRAINE PATIENTS WITH AND WITHOUT NECK PAIN

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Background: No previous study has investigated the presence of cervical spine postural changes in patients with migraine assessed by radiography.

Aim: To investigate differences in the alignment of the head and the cervical spine between patients with migraine and healthy people by using X-ray.

Methods: Fifty patients with migraine diagnosed according to the ICHDIII¹ were included. They were divided into migraine with (n=39) and without (n=11) neck pain. Subjects had no history of cervical injury, disc herniation or physiotherapy treatment in the last year. A radiograph of the sagittal cranio-cervical region was taken in all subjects to examine head/neck posture. By using K-Pacs® software 4 specific angles (HCA-high cervical angle; LCA-low cervical angle; APA-atlas plane angle; Cobb A-Cobb angle) and 4 specific distances (C2/C7PT-posterior tangent C2-C7; C0/C1D-C0/C1 distance; ATD-anterior translation distance; HT-hyoid triangle) were measured.

Results: No significant differences between patients with and without neck pain were observed for any outcome: (HCA: 66.3 95%CI 65-69 vs. 70.3 95%CI 62.1-68, P=0.12; LCA: 10.2 95%CI 7.8-11.3 vs. 9.8 95%CI 5.61-11.9, P=0.88; APA: 18.1 95%CI 14.4-18.9 vs. 18.5 95%CI 13.1-21.7, P=0.9; C2/C7PT: 18.4 95%CI 11.9-16.8 vs. 20.3 95%CI 10.3-22.6, P=0.70; Cobb A: 12.9 95%CI 30.1-34.6 vs. 12.7 95%CI 26.3-38.1, P=0.99; C0/C1D: 8.7 95%CI 7.6-9.9 vs. 20.3 95%CI 6.2-9.1, P=0.21; ATD: 17.5 95%CI 9.2-14.7 vs. 13.1 95%CI 8.0-19.0, P=0.21; HT: 2.3 95%CI 0.4-4.3 vs. 5.7 95%CI 2.5-8.8, P=0.10).

Conclusion: Our study showed that cervical spine posture is similar between patients with migraine with and without neck pain.

EFIC5-0089

Clinical pain states: Headache (Migraine)

THE RELATIONSHIP BETWEEN INSULIN RESISTANCE AND CHRONIC MIGRAINE

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Aims; In recent years, some trials and studies showing the relation between episodic migraine associated with insulin resistance and impaired oral glucose tolerance test (OGTT) have been published. In this study, we aimed to investigate the relationship between chronic migraine and glucose and insulin metabolisms by comparing 3 groups: episodic migraine without aura, migraine with aura and healthy controls.

Material-methods; A total of 110 patients that diagnosed migraine and 40 healthy controls has participated in this study, of these 110 patients, 56 patients had episodic migraine without aura; 29 patients had migraine with aura and 25 patients had chronic migraine. Height and weight measurements and body mass index of patients and control groups were calculated. Waist circumferences of patients were measured. OGTT was performed for all the participants. Insulin resistance was calculated by the formula of HOMA (homeostasis model assessment).

Results; fasting blood glucose levels of each subtypes of migraine was significantly higher than the control group ($p = 0.013$). Height, weight, OGTT (0, 30, 60, 90 and 120 min), insulin level, BMI and HOMA-IR were not significantly different in migraine and control group and also among migraine subgroups ($p = 0.10$, $p = 0.79$). Compared with chronic migraine and control group, the number of patients with insulin resistance was significantly more in chronic migraine group ($p = 0.035$)

Conclusions; insulin and glucose metabolisms are clearly more complicated than expected in both migraine and chronic migraine. However, prospective and controlled studies with larger populations are needed to clarify this relationship

EFIC5-0188

Clinical pain states: Headache (Migraine)

DECIPHERING MALADAPTIVE MECHANISMS ELICITED BY CORTICAL SPREADING DEPRESSION IN RATS AND ITS RELATIONSHIP WITH MIGRAINE ATTACKS

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Background: Cortical spreading depression (CSD) mechanisms probably underlie migraine aura (MA) and the primary activation of the trigeminovascular system (TGVS) that triggers headaches. Crucial unsolved issues include CSD influences in migraine without aura (MO) and whether MA and headache are parallel or sequential processes.

Methods: We revisited the impact of CSD upon maladaptive TGVS plasticity by using real-time functional thalamo-cortical ultrasound imaging, combined simultaneously with *in vivo* multi-site recordings of rat somatosensory cortex (S1) neurons. A detailed exploration of the time course and spatial spread of CSD waves affecting thalamo-cortical hemodynamic activities in either a coronal or a sagittal plane orientation was correlated with modifications in extracellular S1 local field potentials.

Results: High resolution detection of hemodynamic and sensory activities showed progressive increases of responses elicited by ophthalmic noxious stimuli at precise spatiotemporal scales, following CSD triggered from the primary visual cortex. Afterwards, a late CSD originating within S1 occurs only following periorbital noxious stimulation, suggesting that cortical areas clinically silent could cause MO following central sensitization.

Conclusions: Maladaptive mechanisms of cortical metaplasticity have precise spatio-temporal profiles and are affected specifically by neuronal and/or glial pharmacological manipulations. This new animal model has strong translational value for investigating curative/preventive strategies aiming at alleviating migraine attacks

EFIC5-0275

Clinical pain states: Headache (Migraine)

THE FACTORS AFFECTING MENSTRUAL MIGRAINE AMONG UNIVERSITY STUDENTS

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Background and Aims: Menstrual migraine is a highly prevalent and disabling condition that affects the quality of life of women. This study was carried out to determine the factors affecting menstrual migraine among university students.

Methods: This descriptive study was conducted with 98 female university students who have diagnosed with migraine. The data were collected by a survey prepared by the researchers and the severity of migraine was measured with 0-10 Numeric Scale.

Results: The average migraine scores were found 5.92 ± 2.15 during menstruation, 6.38 ± 2.02 any time apart from menstruation. 86.7% of the students were diagnosed with migraine after their menarche and 91.8% stated that they are having migraine attacks both during menstruation and any time apart from menstruation. To cope with migraine, 80.6% of the sample were using alternative methods; 70.4% were resting in a dark, 49% were doing head/neck massage. Among the students whose migraine is triggered by certain foods/drinks (69.4%), migraine is triggered mostly by the consumption of caffeine (58.8%), alcohol (44.1%) and chocolate (27.9%). The students whose migraine is triggered by sleeping less/more than 8 hours were reported higher migraine scores. Among the students with Pre-Menstrual Syndrome (PMS), the ones who have nausea/vomiting during PMS reported higher migraine scores during menstruation.

Conclusions: Migraine attacks are triggered by many factors such as foods/drinks, sleeping pattern, premenstrual syndrome and can be seen both during menstruation and apart from the menstruation. It's essential to diagnose whether it's menstrual migraine and start effective treatment to improve the quality of life.

EFIC5-0515

Clinical pain states: Headache (Migraine)

MIGRAINE: NEUROIMAGING STRUCTURAL ABNORMALITIES

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Background and aims. The purpose of our study is the investigation of white matter tracts damages with estimation of theirs part in different types of migraine realization.

Methods. We investigated 69 patients suffering from migraine, aged 16-42 years (mean age was 29.2 ± 0.52) with DT MRI (Diffusion tensor magnetic resonance imaging) and tractography. Analysis of fractional anisotropy (FA) and mean diffusivity (MD) was performed. 18 normal volunteers were at control group.

Results. According to the DT MRI, the patients without aura were characterized by structural abnormalities with a decrease in FA in the anterior frontal and temporal lobes of brain and by significant MD changes in the posterior parts of cerebral hemispheres ($P > 0.05$). Besides, the tractographic pattern was depleted in brain occipital lobes, and the posterior commissure was not visualized. Significant FA decreasing and MD increasing in patients with aura was noted in the area of optic radiation and hippocampal connections.

Conclusions. The phenomenon of spreading depression appearing not only in cortex but in other brain structures, first of all in hippocampus. In this structure, thalamic structures that limits the manifestation of developing thalamocortical dysfunction. The obtained data indicate not only a neuron tissue lesion in patients suffering from migraine but, probably, do not exclude a feedback in this event hierarchy and the deafferentation probability conditioned by a loss of hippocampal bonds. This state is confirmed by decreasing tracts in limbic zones that also plays an important role in the damage of brain extrahippocampal parts.

EFIC5-0529

Clinical pain states: Headache (Migraine)

SUPRATHRESHOLD HEAT PAIN RATINGS BY MIGRAINE PHASE: A BLINDED LONGITUDINAL STUDY

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Background and aims

Several pain measures are altered in migraineurs. Our aim was to explore how the pain rating in response to prolonged suprathreshold heat pain stimulation changes during the migraine cycle in a blinded longitudinal study.

Methods

Forty-nine migraineurs were examined four times and 31 controls once with suprathreshold heat on the forearm and temple. Subjects rated degree of pain on a numerical rating scale (NRS) ranging from 0 ('no pain') to 10 ('unbearable pain') continuously during 30 seconds of constant noxious heat stimulation. Headache diaries were used to classify measurements as interictal, preictal, ictal or postictal with a one-day limit. Pain ratings were analyzed with piecewise linear mixed models (LMM) with rating as dependent variable, migraine (phase or diagnosis) and time as fixed factors and subject and time as random factors.

Results

Initial pain ratings from arm and temple were lower preictally (LMM mean [95% CI] difference: Arm: -0.95 [-1.45, -0.2], $p = 0.009$. Temple: -0.92 [-1.54, -0.19], $p = 0.013$). Change in pain ratings were less pronounced from 10-20s preictally (0.91 [0.32, 1.67], $p = 0.003$). NRS scores were not significantly different in migraineurs and controls.

Conclusions

Initial hypoalgesia, followed by an increase in temporal summation of pain in the preictal measurements indicate changes in cortical processing of nociceptive stimuli, possibly caused by an altered activity in descending pain modulation. An initial increase followed by a decrease in descending pain modulation preictally could be of importance for the development of a migraine attack.

SOMATO-SENSORY OVER-RESPONSIVENESS IN MIGRAINEURS WITH AURA

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Background & Aims: Hypersensitivity to noxious stimuli and pro-nociceptive pain modulation were reported for interictal migraine. However, differences in pain modulation processes in migraine “with” (MWA) and “without” (MOA) aura are not well characterized. Somato-sensory responsiveness is assessed clinically in subjects with sensory modulation disorder (SMD), and similar assessment can characterize features of migraine as well. We examined whether the relationship between sensory responsiveness and pain modulation tests differ in MWA versus MOA.

Methods: 15 MWA (39.6±13.5 yrs) and 14 MOA (40.0±12.0 yrs) female patients underwent interictal psychophysical pain assessment, including mechanical temporal summation (mTS) stimulation and conditioned pain modulation (CPM) of contact heat pain by hot water. Sensory responsiveness and pain-related psychological variables were evaluated.

Results: MWA group who had more attacks/month (9.1±3.5 vs. 6.1±3.1, $p=0.022$) showed higher sensory over-responsiveness scores compared to the MOA group (2.6±0.6 vs. 2.0±0.5, $p=0.005$, respectively). Sensory over-responsiveness was detected in 41% of the patients. Moreover, its probability was significantly higher in MWA than in MOA (9 out of 15 vs. 3 out of 14; likelihood ratio chi-square $p=0.035$). The sensory over-responsiveness was associated with higher mTS magnitude ($r=0.468$; $p=0.010$) but not with CPM ($r=-0.172$; $p=0.381$).

Conclusions: Somato-sensory over-responsiveness might constitute part of the well-known disinhibition characterizing migraine with aura. The association between sensory over-responsiveness, attack frequency, and pro-nociceptive facilitatory pain modulation suggests similar underlying mechanisms for SMD and migraine with aura.

A BLINDED STUDY OF CORTICAL EXCITABILITY, INHIBITION AND FACILITATION MEASURED BY NAVIGATED TRANSCRANIAL MAGNETIC STIMULATION IN MIGRAINEURS

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Background and aims

Migraineurs often experience increased sensitivity to sensory input interictally. Altered cortical excitability may therefore be important for migraine pathophysiology. Studies of cortical excitability have yielded discrepant results, possibly because of methodological differences, including lack of blinding. We aimed to explore motor cortical excitability in migraineurs using navigated transcranial magnetic stimulation (TMS) in a blinded study.

Methods

43 migraineurs and 33 controls (27 women) were included. Migraineurs were grouped as preictal (n = 7) or interictal (n= 33, 24 women). Resting motor threshold (RMT), cortical silent period (CSP), short intracortical inhibition (SICI), and intracortical facilitation (ICF) were measured. Researchers were blinded to diagnosis during measurements and data analysis. RMT and CSP were analysed with Student's t-test. SICI and ICF were analysed with repeated measures ANOVA (interstimulus interval as within-subject factor, diagnosis as between subject factor). Interictal migraineurs were compared with preictal migraineurs and controls. Correlations between RMT and clinical variables were investigated with Spearman's rho.

Results

RMT and CSP were not different in interictal migraineurs and controls or preictal migraineurs ($p > 0.42$). CSP was shortened in female interictal migraineurs ($p = 0.040$). ICF tended to be decreased in migraineurs ($p = 0.050$). RMT correlated negatively with intensity of phonosensitivity during migraine attack ($p = 0.004$).

Conclusions

RMT and CSP measurements did not indicate altered motor cortical excitability interictally. However, RMT and phonosensitivity correlated, suggesting that cortical excitability may influence migraine symptoms. Decreased ICF interictally and shortened CSP in female migraineurs imply altered NMDA-receptor and GABA-receptor function.

THE EXPERIENCE OF DYSMENORRHOEA AMONG STUDENTS IN GHANA: PAIN EFFECTS AND MANAGEMENT

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Background and aims: Severe dysmenorrhoea has debilitating effect on sufferers and interferes with school attendance. The study aimed at investigating the effect of dysmenorrhoea on students and the strategies adopted to manage and cope with dysmenorrhoea.

Methods: We employed a descriptive phenomenology design to investigate the phenomenon under study. Sixteen participants were recruited from a University and a Senior High School (SHS) in Accra, Ghana using purposive and snowball sampling techniques. Data analysis occurred concurrently using the techniques of content analysis and the NVivo software was used to manage the data.

Results: We found that dysmenorrhoea was associated with symptoms such as diarrhoea, headache and vomiting. Pain started one week to the day of menstruation and the severity differed. The effect of dysmenorrhoea included activity intolerance, altered emotion and interaction, altered sleep pattern, absenteeism and inattentiveness, wishes and regrets, and misconceptions.

Also, sufferers of dysmenorrhea employed both pharmacologic (orthodox and herbal) and non-pharmacologic measures such as warm compress, exercise, and water and diet therapy to manage the pain. Menstrual pain was managed at the school clinic and the hospital. Coping measures adopted were planning activities before the onset of pain, receiving social and spiritual support, and developing a mind-set to bear pain.

Conclusions: Negative effects of dysmenorrhoea call for pragmatic context applicable measures to effectively manage pain among adolescents and young women in school. Regular school attendance may promote academic excellence which would ensure better quality of life. Therefore dysmenorrhoea among students should be given the desired attention.

EFIC5-0910

Human behavioural science: Occupational, school, and work context

IMPROVING PAIN MANAGEMENT IN OCCUPATIONAL HEALTH SETTINGS IN ORDER TO PREVENT WORK DISABILITY

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Background and aims

Helsinki City Occupational Health Centre provides occupational health (OH) services to almost 40,000 employees working in the city departments. Every year, pain and pain-related diseases cause hundreds of thousands of sickness absence days among city employees. Additionally, the majority of work disability pensions are related to pain.

'Pain and Work Disability' is a newly developed project with the aim of systematically improving pain management in OH settings in order to reduce work disability.

Methods

The Project includes following modules: enhancing the use of comprehensive pain management tools (particularly non-pharmacological); screening systematically 'yellow flags' to detect high risk disability cases; finding alternatives for full-time sick leave (fit note, part-time sick leave etc.); creating common guidelines for sick leave prescribing; providing direct access to physiotherapist (self-referral); enhancing the use of cognitive functional therapy among physiotherapists; educating upper management, supervisors and employees; launching pain management groups etc.

Various outcome measurements will be used, including surveys, number of consultations, sickness absence data, disability pensions etc.

Results

The planning and development of the project has started in January 2015 and the project will continue the following 2-3 years. In EFIC congress in September 2015 I will present the project in more detail hopefully with some preliminary results .

Conclusions

More comprehensive and systematic pain management tools are needed to better manage the massive burden of work disability related to pain and chronic pain in particular. At least in Finland, OH plays a key role in this shift of paradigm.

PAIN REPRESENTATIONS TO UNDERSTAND WORK DISABILITY AFTER TOTAL KNEE ARTHROPLASTY

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Background and aims: The proportion of younger patients with OA (<65 years) undergoing total knee arthroplasty (TKA) is increasing, accounting for nearly half of all cases in Canada. Even though TKA is effective in reducing pain, one in five reports dissatisfaction. Studying pain representations of these young working patients might provide some answers. This paper addresses pain representations of disabled working patients following TKA.

Methods: We adopted a qualitative study with a narrative inquiry method. A convenient sample of partially and fully disabled workers was interviewed 6 to 12 months post TKA. We used a pretested, semi-structured interview guide. Individual interviews were audio recorded, transcribed verbatim and subsequently anonymized. Consensus on coding and content analysis was established using Atlas-Ti software.

Results: The majority of the participants reported a reduction in pain, compared to their preoperative state. Half of the sample (4 men and 4 women) were fully disabled workers, and had a moderate to high level of physical work demand. They reported a significant level of pain, and more functional limitations. These participants had very few strategies to promote adaptation, other than waiting to get better, which did not make any sense to them. The partially disabled workers had fewer physical work demands. They perceived self-efficacy in managing pain and mentioned adopting active pain management strategies to help them resume their working role.

Conclusions: Pain representations helped identify participants' misunderstanding of their health condition and needs in order to promote an active working life.

EFFICACY AND TOLERABILITY OF PROLONGED-RELEASE OXYCODONE/NALOXONE AND OXYCODONE IN SUBJECTS WITH MODERATE TO SEVERE CANCER PAIN: A PROPENSITY ANALYSIS COMPARISON.

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Background: In cancer patients treated with opioids, oral PR Oxycodone-Naloxone (OXN) was found effective, with sustained analgesia and improved constipation. Scant data are available regarding OXN compared to PR Oxycodone (OXY) in opioid-naïve patients.

Methods: Consecutive cancer patients naïve to opioids, who received OXY or OXN moderate-to-severe pain were selected; to adjust for bias inherent to heterogeneity and decision about their oxycodone therapies, propensity matching analysis by multivariable logistic regression model was performed. Outcome measures included efficacy (pain/NRS, neuropathic pain/DN4, Chronic Pain Sleep Inventory CPSI), drug dosages, constipation (Bowel Function Index/BFI and laxative consumption), and safety.

Results 105 OXY and 105 OXN patients were identified; baseline demographics and clinical features were comparable (males 58%; age 63.3±12; pain intensity NRS 7.3±1.4; DN4 4.9±1.4; starting oxycodone 11.9±5 mg daily; BFI 26.4±28; laxatives 29%). After adjusting for propensity score and other confounders, no differences were found between OXY and OXN concerning 30-day analgesic efficacy (NRS: 4.9±2.4 OXY vs 5.0±1.7 OXN; NRS <5 and decrease >30%: 56.4% vs 53.6%), 60-day NRS, DN4 or CPSI (all NS). Daily oxycodone dosages were similar and steadily low (60-day: 20.4±11 vs 22.0±10 mg; NS). On the contrary, BFI significantly improved after OXN (30-day: -14±17 vs +14±18 OXY; 60-day: -17±19 vs +13±19, p<0.0001), despite less laxatives. Fewer patients prematurely discontinued OXN due to severe side effects (5.5% vs 15.1% vs OXY pts; OR 0.33, 95% CI 0.09-1.08).

Conclusions In cancer patients naïve to opioids, agonist-antagonist OXN showed preserved analgesia with early and sustained tolerability advantages.

FENTANYL BUCCAL TABLETS TO TREAT HEAD/NECK CANCER, ILEUS, AND OTHER CONDITIONS THAT CANNOT BE TREATED WITH ORALLY ADMINISTERED OPIOIDS

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【Background and aims】 Fentanyl buccal tablets (FBT) have been marketed in Japan since September 2013 to treat breakthrough pain (BTP) in patients with controlled persistent pain. These tablets may also be used in patients unable to receive orally administered opioids because of head/neck cancer, ileus, and other diseases. We evaluated the safety and efficacy of FBT, based on data collected at our facility. 【Methods】 Data from patients prescribed FBT at our hospital between October 2013 and January 2014 were analyzed retrospectively. 【Results】 FBT was given for the treatment of BTP in 24 patients whose pain was controlled by periodic medication. Mild dizziness was observed in three cases; however, there were no severe adverse events. Ten patients had difficulty receiving orally administered opioids, including two cases of head/neck cancer-induced dysphagia, one case of trismus, and seven cases of ileus. Twelve patients received buccal administration, whereas twelve were sublingually administered. In all recent patients, FBT was administered through the sublingual route, with the exception of buccal administration in a patient with excessive saliva, despite the presence of dysphagia. In the trismus patient, it was also administered buccally. Patients had favorable opinions of sublingual treatment. 【Conclusions】 Use of FBT in patients with head/neck cancer and ileus was safe and effective in treating BTP. This product will likely be beneficial, due to its rapid analgesic effects and easy application in patients unable to take drugs orally.

EFFICACY AND SAFETY OF METHADONE IN THE TREATMENT OF CANCER PAIN : THE EQUIMETH2 STUDY, NATIONAL, RANDOMIZED, OPEN PHASE III STUDY

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Objectives

The study aimed at comparing the effect of two methadone titration methods (Stop and Go vs progressive titration) in 146 patients with cancer related pain inadequately relieved or intolerant to level 3 opioids. The primary endpoint was the rate of success/failure at Day 4 defined by pain relief (reduction of at least two points of the EVA AND a pain score <5 for 2 consecutive days) AND no overdose (Rudkin scale ≥ 3 AND respiratory rate <8/min).

Results

Pain was nociceptive in 16% and mixed in 84%. 85% of the patients had breakthrough pain. Half received oxycodone, 1/5 fentanyl, 1/5 morphine and < 10% hydromorphone. Reasons for switching were lack of efficacy isolated (56%), or with intolerance (38%).

>2/3 of the patients reached a pain score <5 for two days at D4, adequate pain relief was obtained in 80% of the patients (median of 3 days in both groups ($p = 0.12$)) and lasted until D56. The rate of success/failure was about 40% at D4 with no difference between the two methods.

Overdoses were observed in 13.2% patients throughout the study with no difference between groups. 9 required naloxone. The two methods are equally considered easy by about 60% of the clinicians.

Conclusion

Methadone is an effective and sustainable second-line alternative opioid in the treatment of cancer pain in patients inadequately relieved or intolerant to level 3 opioids. The two methods of titration of methadone are comparable in terms of efficacy, safety and ease of use.

EFIC5-0782

Pain treatment (conservative): Cancer pain – Opioids

A CHARACTERISTIC OF PATIENTS WITH CHRONIC CANCER PAIN TREATED WITH OXYCODONE (AT DAILY DOSE OF 80 MG OR MORE)

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Background and aims

The aim of the study was making characteristic of patients with cancer pain, assessment of some life quality aspects and assessment of safety by reporting side effects during a 3-month period of oxycodone treatment administered as a controlled-release tablets of the AcroContin system.

Methods

A general assessment included selected demographic data and patient`s history concerned cancer diagnosis, primary origin, metastases, pain characteristic, duration, type and localization, intensity, breakthrough pain, prior analgesics, adjuvants and constipation prophylaxis. The patients was asked whether pain interferes with some aspects of life (general activity, mood, relations with other people and sleeping). The observation included 5 patient`s visits.

Results

The study involved 502 patients. Nearly 95% of the pain was associated with the development of cancer. Diagnosed pain was mainly somatic (70%), visceral and neuropathic (both 40%). Before the study 85% of patients took strong opioids (oxycodone 59%, fentanyl TTS 33%, buprenorphine TTS 13%, morphine 13 % and methadone 0.5%). Breakthrough pain was treated with morphine IR (82→69%) and fentanyl (nasal 11→26%, buccal 9→13%). In the treatment of neuropathic pain mainly gabapentin (49%) and amitriptyline (31%) were used. The decrease of pain intensity from 6.0 to 2.3 (NRS) was observed as well as a positive impact on the patient`s activities, mood, sleep and contacts with other people. Side effects occurred in only 2% of patients.

Conclusions

Oxycodone therapy was highly effective when administered both as monotherapy and in combination with other analgesics/coanalgesics and had positive influence on various aspects of life and good tolerability.

DYNAMIC AND STATIC CEPHALIC MECHANICAL PAIN HYPERSENSITIVITY IS ASSOCIATED IN TENSION TYPE HEADACHE

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Background and aims: Several studies have reported lower pressure pain thresholds (PPT) in tension type headache (TTH); however PPT is a static measure. A new method for assessing dynamic hyperalgesia has been developed. Our aim was to investigate the association between static and dynamic pressure pain hyperalgesia in TTH. **Methods:** Women with TTH diagnosed according to the International Headache Classification (ICHD-III) were recruited. Exclusion criteria included other headaches, whiplash or fibromyalgia. PPTs over the temporalis muscle belly was obtained to determine static hyperalgesia. Dynamic hyperalgesia was assessed with a dynamic pressure algometry set (Aalborg University, Denmark©) consisting of 8 rollers with a fixed level (500g, 700g, 850g, 1350g, 1550g, 2200g, 3850g, 5300g). Each roller was moved at a speed of 0.5 cm/sec over a diagonal line covering the temporalis muscle. The dynamic pain threshold (DPT - load level of the first painful roller) was determined and pain intensity was rated on a numerical pain rate scale (NPRS, 0-10) when rolling over the temporalis muscle. Pearson's correlation coefficients were used to assess correlations between the PPT with DPT and pain. **Results:** Fifty-one women (age: 48±15 years) with a frequency of 16±6 days/month participated. Significant positive associations between static PPT and DPT were bilaterally observed (right, $r = 0.521$; $P < 0.001$; left, $r = 0.420$; $P = 0.005$). Significant negative associations between static PPT and pain on DPT were also found (right, $r = -0.518$; $P < 0.001$; left, $r = -0.321$; $P < 0.036$). **Conclusion:** This study supports a new form of pressure pain assessment with dynamic rollers in a TTH population.

THE NUMBER OF ACTIVE TRIGGER POINTS IS NEGATIVELY ASSOCIATED WITH CEPHALIC AND EXTRA-CEPHALIC PRESSURE PAIN SENSITIVITY IN TENSION TYPE HEADACHE

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Objectives: Evidence supports that the referred pain from active trigger points (TrPs) reproduces tension type headache (TTH). No study has investigated the association of active TrPs with pressure sensitivity in TTH. Our aim was to investigate the association between number of active TrPs and widespread sensitivity in TTH. **Methods:** Patients with TTH diagnosed by experienced neurologists according to International Headache Classification (ICHD-III) were recruited. Exclusion criteria included other primary headaches, medication overuse headache, whiplash or fibromyalgia. TrPs were bilaterally explored within the masseter, temporalis, trapezius, sternocleidomastoid, splenius capitis, and suboccipital muscles. Pressure pain thresholds (PPT) were bilaterally assessed over the temporalis muscle, C5-C6 zygapophyseal joint, second metacarpal, and tibialis anterior muscle. Spearman correlation coefficients were used to determine correlations between the number of active TrPs and PPTs. **Results:** Fifty-two women (age: 49, SD: 13) with a frequency of 16 days/month (SD: 8) participated. Each woman with TTH exhibited 3.8 ± 2.3 active TrPs. The number of active TrPs showed negative associations with PPT in the temporalis muscle (left: r_s : -0.373; $P=0.008$; right: r_s : -0.336; $P=0.018$), C5-C6 (left: r_s : -0.353; $P=0.045$; right: r_s : -0.365; $P=0.010$) and second metacarpal (left: r_s : -0.305; $P=0.033$; right: r_s : -0.229; $P=0.044$), but not with the tibialis anterior muscle ($P>0.10$): the higher the number of active TrPs, the lower the PPT, i.e., the higher the pressure sensitivity. **Conclusion:** The number of active TrPs was negatively associated with cephalic and extra-cephalic pressure pain hyperalgesia, i.e., the more TrPs, the more sensitization, in women with frequent episodic or chronic TTH.

EFIC5-0349

Clinical pain states: Headache (Tension type)

DIAGNOSTIC TRANSCRANIAL MAGNETIC STIMULATION IN TENSION-TYPE HEADACHE

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Background: Primary headaches pathogenesis is supposed to involve changed excitability of cortical structures which can be evaluated by transcranial magnetic stimulation (TMS).

Aims: To study neurophysiological changes and emotional disturbances in tension-type headache patients.

Methods: 51 tension-type headache (TTH) patients aged 20-55 and 10 age- and sex-matched healthy controls were investigated using 100-point visual analogous scale (VAS), Spielberger's anxiety questionnaire, Beck's depression inventory, SF-36 quality of life (QoL) inventory, diagnostic transcranial magnetic stimulation (TMS).

Results: Pain intensity was (Me) – 50.00 VAS points. Trait anxiety ($p=0.001$) and depression scores ($p=0.003$) in TTH patients was significantly higher than in controls. Correlation was revealed between trait anxiety scores and pain intensity ($R=0.372$; $p=0.007$). TTH patients showed diminished QoL in domains: physical functioning ($p=0.001$), role limitation - physical ($p=0.007$), bodily pain ($p=0.001$), social function ($p=0.010$). TMS showed increased amplitude of response (stimulation of the left hemisphere) in TTH patients (Me=3.00; 95%CI 2.80 – 4.26) compared with controls (Me=1.20; 95%CI 0,63 - 2,30; $p=0.007$). During right-sided stimulation increased amplitude of response in TTH patients was also revealed (Me=4.00; 95%CI 3.31 – 4.64) compared with controls (Me=1.55; 95%CI 0,86 - 3,35; $p=0.011$). Statistically significant direct correlation was revealed between trait anxiety scores and amplitude of TMS response (left-sided stimulation) in TTH patients ($R=0.517$; $p=0.016$).

Conclusions: Patients with tension-type headache showed low QoL, high trait anxiety and depression. Trait anxiety correlated with the amplitude of the TMS response, which may be a sign of greater excitability of cerebral cortex in TTH patients with higher levels of anxiety.

BARRIERS TO SELF-MANAGEMENT OF CHRONIC PAIN IN PRIMARY CARE: A QUALITATIVE STUDY BASED IN SCOTLAND

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Background and aims

Supported self-management can be an effective intervention for chronic pain and should enable an individual to reduce the impact that chronic pain has on their everyday life. Some people may need the help of primary care healthcare professionals (HCPs) to manage their pain. This project aimed to gather evidence of possible barriers to self-management of chronic pain in primary care.

Method

Eighteen focus groups were held with people with chronic pain and their carers ('patients') and primary care HCPs throughout Scotland. 54 patients, 9 carers and 38 HCPs attended the groups. Focus group recordings were fully analysed by two researchers using n-vivo analysis software.

Results

Four categories of barriers emerged. **Patient/HCP Consultation:** Some patients felt self-management was not discussed or discussed too late. There were consistent examples of both parties misinterpreting messages. **Patient Experience:** Patients often felt unsupported by HCPs and struggled with the emotional impact of pain. HCPs questioned some patient's readiness or ability to self-manage. **Limited Treatment Options:** Some participants felt there was a tendency for over-medicalisation but there were concerns regarding other self-management options such as the content and longevity of 3rd-sector support services. **Organisational Constraints:** Short appointments, waiting lists and a compartmentalised NHS challenged the promotion and adoption of self-management.

Conclusions

The project found evidence of many potential barriers to self-management of chronic pain in primary care from both a patient and HCP perspective. Knowledge of such barriers may provide the basis for initiating change to increase uptake and improve self-management support.

EFIC5-0217

Human behavioural science: Patient health-care provider communication

THE IMPACT OF COGNITIVE AND AFFECTIVE GENERAL PRACTITIONER REASSURANCE ON OUTCOMES IN LOW BACK PAIN

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Background and aims

Reassurance is commonly recommended in guidelines for the management of Low Back Pain (LBP) in primary care, but what this means and how to effectively reassure patients remains undefined. A distinction can be made between cognitive (informational) and affective (emotional) reassurance strategies, which may lead patients to process reassurance messages differently and so may impact on the lasting utility of these messages outside of the consultation room. This study aims to assess whether cognitive and affective reassurance differently impact outcomes in LBP patients.

Methods

Patients who consulted their General Practitioner (GP) for LBP at one of 43 surgeries in Northamptonshire, Surrey, Kent or Sussex were sent a questionnaire, measuring how they had perceived practitioner reassurance during their consultation, along with their satisfaction and enablement. A follow-up questionnaire one-week later again assessed satisfaction and enablement, while a three-month follow-up questionnaire measured depression, anxiety, time off work, disability and pain intensity. Regression models assessed the impact of different types of reassurance on patient outcomes at one-week and three-months.

Results

TBC - recruitment closes 30/04/2015

Conclusion

TBC

COMMUNICATION WITH THE FAMILY FACING CRITICAL ILLNESS SITUATION

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Background and AIMS: Family experiences anxiety as a constant in the admission of a person in ICU and show concern about developments and the procedures performed. The possibility of pain and suffering associated with a critical illness causes great concern to the family. They seek to understand the dynamics of the service, the professionals working there and how can they access to patient care unit. This study aims to understand families' lived experience in ICU and how the communication with nursing team is carried out and what kind of information the family is looking for.

Method: 15 adult family members hospitalized in UCI were interviewed. The analysis and interpretation of the narratives, was performed according to the phenomenological approach suggested by VanManen.

Results: The family communicates with the team in visiting times and in specific situations, by telephone. The family support is carried out by the nurse responsible for the patient. It is verified that family lists certain nurses as a reference for the quality and quantity of the information gathered. The updated, genuine and detailed information is highlighted. Family seeks to know what is the situation prognosis and which are the planned therapeutic interventions in order to guarantee to their relative the relief of symptoms, the clinical recovery and comfort.

Conclusions: The communication with the team proves to be a great support for the family because it allows them to clarify all doubts, to create a structured thought about the situation and deal with the constant anxiety and uncertainty.

PAIN ASSESMENT IN HOME MONITORED DISABLED PERSONS

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Background and aims: Home monitoring of disabled persons is done in Tunisia by families or non organizational caregivers. The assisted persons may be non communicating or having many disabilities, but very often they experiment care-related pain, increased by anxiety and fear. The aim of the study was to translate in Tunisian Arabic dialect a scale and test in a disabled group.

Method: 88 disabled persons have been assessed by their families' members or care givers. Socio-demographic characteristics, type, degree and origin of the pain, clinical examination were specified. Pain was assessed by the Tunisian Arabic Dialect "Child Pain Questionnaire" (Varni and Thompson 1985), which is a self or straight questionnaire with two main items: the location and the moment of pain, with six-level responses (no pain until very acute pain).

Results: In this context, the origin of the pain is often multifactorial, due to bone and joint contractures, bedsores, or sometimes neuropathic iatrogenic pain (induced by care or during handling). We conducted a therapeutic form of treatment if necessary and especially family guidance and care team staff.

Conclusions: The assessment of pain, usually based on observation and communication, has a dual diagnostic and therapeutic interest, but is not adapted in all cases. The use of "Child Pain Questionnaire" seems easy for parents and care givers and useful to screen pain, as well as to sensitize the care givers to change their procedures in order to improve patients' quality of life.

MEASURING THE UPTAKE OF SHARED DECISION MAKING IN ROUTINE CLINICAL CARE OF WORKERS WITH CHRONIC PAIN

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Background and aims

Shared decision making (SDM) guides the process of complex trade-offs between potential harms and benefits of multiple options and is recommended by the American Pain Society. We assessed uptake of SDM in routine clinical care of workers with chronic pain.

Methods

We used a mixed methods case study design. The case was bounded by the dyad (the worker and his occupational therapist) in a context of a routine clinical care where they have to take into account stakeholders (insurer, employer) in the decisional process. Eligible workers were those having persistent pain causing work disability. We implemented SDM using training of occupational therapists (9 hours, plus prior readings). We collected data from workers, clinicians, insurer, and employers using semi structured interviews, self-administered questionnaires, and non-participant observation. We analyzed data using an analytical grid based on SDM indicators.

Results

Out of 62, we recruited 39 workers and their 10 occupational therapists. Therefore, a total of 39 cases allowed establishing that out of 55 indicators, 24 (44%) were implemented in more than 75% of the cases. Six indicators (11%) had low implementation, namely less than 25% of the cases. These indicators were the establishment of a working alliance between the occupational therapist and the worker, the maintenance of the working alliance with other stakeholders and agreement on the decision (option), the objective and the action plan to be implemented.

Conclusions

With training, occupational therapists achieved a satisfactory level of SDM implementation, even in a third-party payer context.

EFIC5-1005

Human behavioural science: Patient health-care provider communication

THE RELATIONSHIP BETWEEN PATIENT SATISFACTION WITH TREATMENT FOR CHRONIC PAIN AND QUALITY OF LIFE

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Background and aims Unfortunately, approximately 40% of the patients with chronic pain reports to receive insufficient pain management. Therefore, the necessity to improve the quality of chronic pain treatment is high. It is known that high patient satisfaction is an important aspect of high quality care. The main aim of the present study is to examine patient satisfaction with chronic pain treatment. Furthermore, we will explore the relationship between patient satisfaction and quality of life. **Methods** Participants of the present study were 741 patients with chronic pain. Patient satisfaction was measured with a self-constructed questionnaire, partly based on the Participant Satisfaction Reporting Scale used by Hirsh and colleagues (2005). Aspects of quality of life were measured with a 12-item subset of the SF-36, the Hospital Anxiety and Depression scale, and several subscales of the Multidimensional Pain Inventory. **Results** On a 0-10 scale overall satisfaction with treatment of chronic pain was 5.67 (SD=2.17). Patients were the least satisfied with the reduction of their pain since the start of treatment (M=4.42, SD=2.74) and with the communication between health care providers (M=5.20, SD=2.78). Patients who are less satisfied also report a lower physical and psychological quality of life and higher levels of anxiety and depression ($p\text{-values} < .01$). Additionally, patients who are less satisfied report less social support and more interference with daily functioning ($p\text{-values} < .01$). **Conclusions** The results of the present study suggest that patient satisfaction with treatment for chronic pain is moderate. Furthermore, patient satisfaction is related to different aspects of quality of life.

EFIC5-0367

Pain treatment (conservative): Cancer pain – Other

USE OF 8% CAPSAICYNE PATCH FOR CANCER TREATMENT RELATED NEUROPATHIC PAIN.

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Introduction

The symptoms of CIPN (chemotherapy induced peripheral neuropathy) are: numbness, burning, tinglings, abnormal sensation of touch, heat and cold (mostly in distal part of extremities). The incidence after *oxycplatin* is 60-80%. Also surgery may be the cause of chronic neuropathic pain. Not all patients respond to pharmacotherapy or interventional treatment. We used for them capsaicin patch.

Goal

Efficacy of capsaicin in cancer-related neuropathic pain.

METHOD

Two patients with post-treatment pain.

63 year old man with colon adenocarcinoma after hemicolectomy and supplemental chemotherapy with oxycplatin. Burning pain and tingling in both legs.

First-line treatment - gabapentin, pregabalin. Patient reported reduction of dysesthesia with the strongest discomfort around the feet. Four capsaicin application, (two on each side).

72 year old woman treated with leiomyosarcoma of uterus. Metastases to the lungs. Four resections of metastatic lumps on both lungs, complicated by chronic post-thoracotomy syndrome. Treated with Gabapentin, pregabalin, thermolysis of the intercostal nerves - moderate effect. We applied on each side Qutenza.

RESULTS

Case 1

Significant reduction of pain in the metatarsal and toes of both feet. Improvement of tactile sensation in plantar, patient can wear shoes. Pain score before application VAS 70, after 40

Case 2

Reduction of stabbing and burning pain (24 hours after application). After 1 month, pain is slowly growing.

L side before application VAS 80, after 20.

R side before 60, after 30

CONCLUSION

Capsaicin patch gives good results in the treatment of cancer-related neuropathy.

EFIC5-0503

Pain treatment (conservative): Cancer pain – Other

USE OF PALMITOYLETHANOLAMIDE IN PERITONEAL CARCINOMATOSIS PAIN MANAGEMENT

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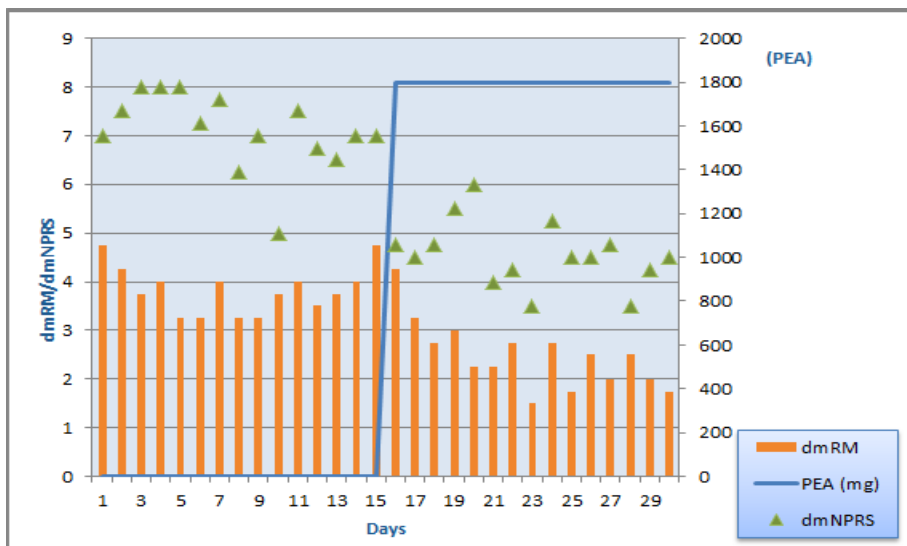
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BACKGROUND AND AIMS: Abdominal pain management in patients with peritoneal carcinomatosis represents a constant challenge in palliative care. A multimodal approach by using opioid and co-analgesic drugs reduces the prevalence of opioid therapy side effects, while maintaining or even improve the quality of analgesia. Palmitoylethanolamide (PEA) is an endogenous lipid with analgesic and anti-inflammatory properties. We verified whether the administration of PEA as an add-on treatment, affects the arithmetic mean of daily rescue medication (dmRM) for breakthrough pain.

METHODS: We identified four patients with abdominal pain due to peritoneal carcinomatosis in treatment with opioid drugs and 40% of Karnofsky performance status scale. We followed-up their daily demand of rescue medication within thirty days. In the middle of this observational period we introduced PEA 600mg, three tablets daily. All other therapies were maintained stable during the follow-up period. Haematological tests to evaluate metabolic control and safety were also performed.

RESULTS: The dmRM before PEA introduction in therapy was 3,83, while the arithmetic mean of daily numerical rating scale for pain (dmNPRS) was 7,1. After PEA administration the dmRM was 2,48 while the dmNPRS was 4,56. The pain management outcomes affected also the Edmonton Symptom Assessment Scale by improving wellbeing and decreasing depression. The haematological tests did not reveal any alterations associated with PEA treatment and no serious adverse events were reported.

CONCLUSIONS: Although further research will be needed, PEA could be considered as a promising and well tolerated add-on treatment for patients in palliative care.



MECHANISMS OF PAINFUL POLYNEUROPATHY IN CANCER PATIENTS

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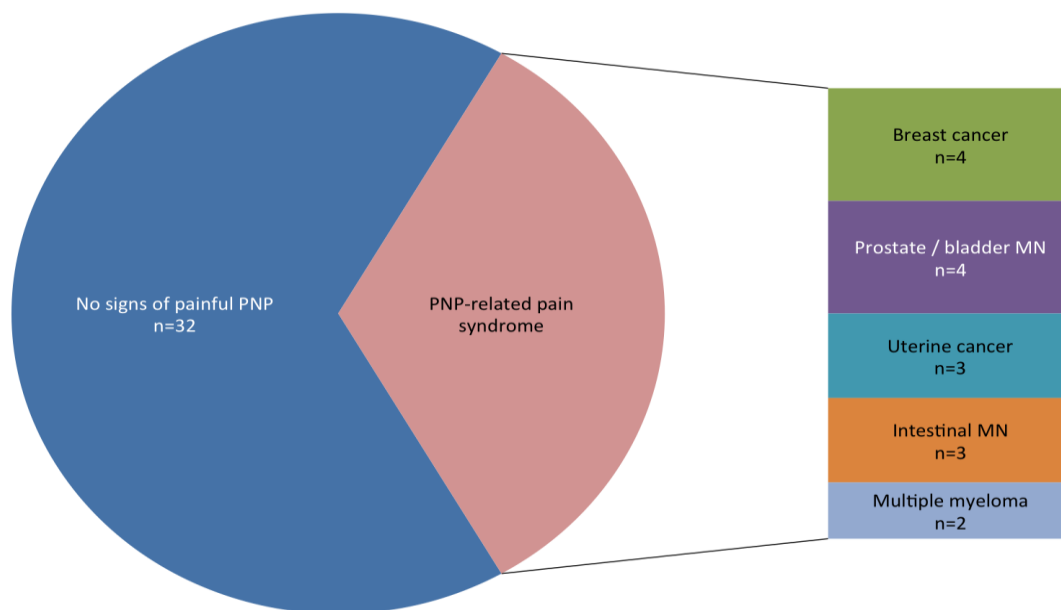
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Background and aims: Evaluation of polyneuropathy-related (PNP) pain in patients with malignant neoplasms (MN) is recognized. However, the systematic data regarding relationship between pain syndrome and course of MN and chemotherapy (CT) is lacking.

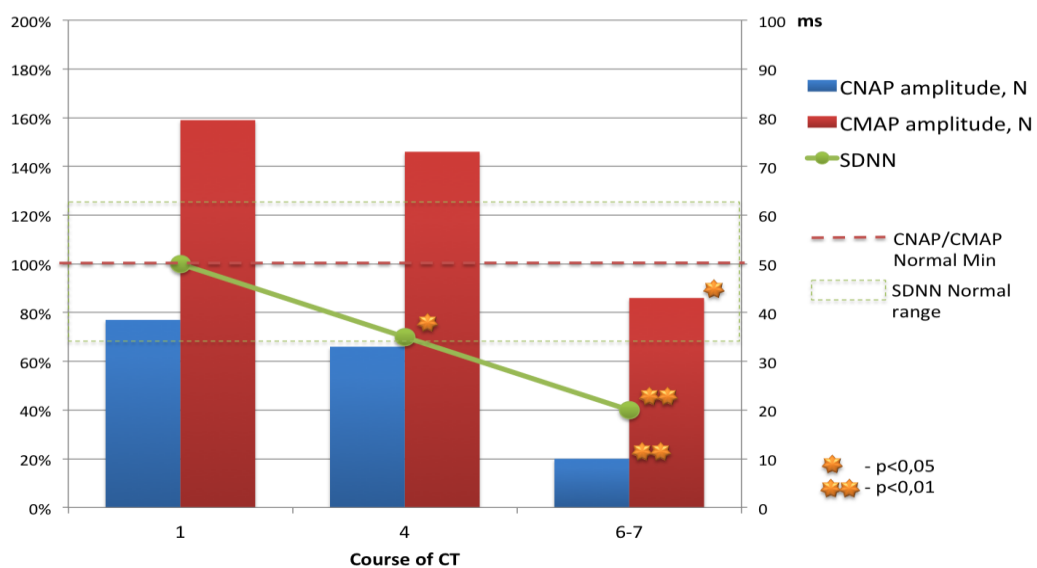
Methods: DN4 and PainDETECT questionnaires, Spielberger and Beck Inventories, pain verbal rating scale (VRS), clinical examination, nerve conduction studies (NCS) and heart rate variability tester.

Results: Of 48 patients, PNP related type of pain was identified in 16. Nociceptive pain was detected in 1 patient, so was psychogenic (6.3%); neuropathic pain – in 4 patients (25%). In most cases (62.5%), the complex pathogenesis of pain was confirmed. Median and range of VRS pain values were 2.0 [1.5; 2.5] points. NCS in 7 patients (43.8%) showed a decrease of S-response amplitudes to 1.6 [0.3; 2.9] mkV. Signs of reduction in reactivity of parasympathetic regulation of heart rate were observed in 9 (56.3%) patients. The VRS increased significantly ($p<0,05$) by the 6-7 course of CT, preceded by the growth of sensory-autonomic impairments ($p<0,01$) by the 4th course, together with the appearance of the motor lesions – by 6-7th, along with the increase of combined pain syndromes and parallel growth in the severity of neuropathic manifestations ($p<0,05$ by PainDETECT) by the 4th course of CT.

Conclusion: The structure of PNP-related pain syndromes in patients with MN is of combined nature, which mechanisms potentiate in the course of CT and significantly grow due to the development of neuropathic component, as well as the transformation of sensory-motor and autonomic impairments.



Inventory / Type of pain	Nociceptive pain, points (n=1)	Psychogenic pain, points (n=1)	Neuropathic pain, Me [LQ; UQ] (n=4)	Complex pain, Me [LQ; UQ] (n=10)
VRS	2	3	1.5 [1.0; 2.5]	2.0 [1.5; 2.0]
DN4	2	2	6.0 [4.0; 5.0]	5.0 [4.0; 5.0]
PainDETECT	15	16	15.0 [9.5; 21.0]	14.0 [13.0; 16.0]
Spielberger	25	38	27.5 [26.0; 33.5]	33.5 [28.0; 39.5]
Beck	8	28	12.5 [8.5; 18.5]	18.5 [16.0; 21.0]



P2Y₁₂ RECEPTOR IN MICROGLIA CONTRIBUTE TONGUE CANCER PAIN IN RATS

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[Background and aims] P2Y₁₂ receptor is thought to be involved in cancer pain as well as neuropathic or inflammatory pain. However, how this receptor contributes to the cancer pain mechanisms is not fully understood. In order to evaluate the involvement of P2Y₁₂ receptor in cancer pain, we developed a rat model of tongue cancer pain and clarified the P2Y₁₂ mechanisms underlying pathological tongue pain associated with tongue cancer.

[Methods] Squamous cell carcinoma (SCC) cells were inoculated into the tongue. Mechanical or heat stimulus was applied to the tongue, and head-withdrawal reflex threshold (HWRT) was measured by recording EMG activity from the splenius capitis muscle under light anesthesia. On day 14 after SCC cells inoculation, the activated microglia and P2Y₁₂ receptor expression were examined immunohistochemically in trigeminal spinal subnucleus caudalis (Vc). The HWRT was also studied in SCC cell-inoculated rats with successive intrathecal administration of selective P2Y₁₂ receptor antagonist (MRS2395) or intraperitoneal administration of minocycline.

[Results] HWRT to mechanical but not heat stimulation of the tongue significantly decreased in SCC cell-inoculated rats compared with vehicle-injected rats. Microglia was strongly activated on day 14, and intrathecal administration of MRS2395 or intraperitoneal administration of minocycline reversed associated nocifensive behavior and microglial activation in SCC cell-inoculated rats for 14 days.

[Conclusion] These findings suggest that microglia is activated via P2Y₁₂ signaling in the Vc resulting in tongue mechanical allodynia associated with tongue cancer.

EFIC5-0843

Pain treatment (conservative): Cancer pain – Other

OPIOID ANALGESICS IN CANCER SURVIVORS- WHAT TO EXPECT?

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Background

67% of adults and 75% of children with cancer are cancer survivors. Cancer survivors requiring opioids are a frequent conundrum of cancer pain management. The benefit of Opioid analgesics promoted during active antineoplastic treatment is often questioned in survivors.

We examined opioid misuse and abuse among "cancer survivors" defined as no evidence or stable malignancy without antineoplastic therapy, seen in our cancer center Palliative Medicine clinic in 2013.

Results

1. Out of 189 "cancer survivors" on opioids, 57 patients (30%) were found to have a progression or recurrence and 21 (11%) - second malignancy within 2 years and 14 died (7%).
2. Out of 21 patients (11%) with opioid misuse/ abuse
 - 15 had psychiatric comorbidity
 - 13 had history of substance abuse
 - 11 were younger than 25 years old when opioids were started

Conclusion:

In our sample, most cancer survivors on opioids remained stable and compliant with treatment. Prolonged severe pain in survivors was associated with recurrent or secondary malignancy. Aberrant drug behavior was associated with history of substance abuse, psychiatric diagnoses, length of opioid exposure, and cancer diagnosed at young age. Increased awareness of the risk of opioid addiction among cancer survivors should prompt close monitoring of opioid use, compliance and when appropriate, opioid taper and discontinuation. Such decisions should not be made unless a recurrence or secondary malignancy have been ruled out.

EFIC5-0971

Pain treatment (conservative): Cancer pain – Other

OWN EXPERIENCES IN USING BISPHOSPHONATES IN TREATMENT OF PAIN CAUSED BY BONE METASTASES. THE CONTINUATION OF THE STUDY.

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Background:

This is an observational study. Study was carried in 2010-2014. 168 patients were treated for 6 - 48 months with bisphosphonates intravenously. 164 subjects had a dose of 90 mg, 4 - 60 mg every 4 weeks.

Methods:

168 patients with pain due to bone metastases (breast cancer, prostate, lung cancer, thyroid gland cancer, sarcoma, ovarian cancer) were enrolled. Initial Pain score (NRS) was: 10 (12 patients), 9 (31 pts), 8 (17 pts), 7 (13 pts), 6 (11 pts), 5 (69 pts), 4 (13 pt), 3 (2 pts). 28 pts did not need any analgesic treatment at the moment, 31 received NLPZ, 7 – gabapentin, 38 patients needed weak opioids, 64 received strong opioids: Buprenorphine TTS 35 mcg/h – 5 subjects, Fentanyl 12 mcg/h - 400! mcg/h 21 patients, Morphine SR 20mg - 400mg per twenty four hours - 9 subjects, Oxycodone 10 – 320mg / 24h - 25 patients. 4 patients needed two different strong opioid medicines.

Results:

After 3 months in treatment and observation all of the patients scored their pain under NRS 6. The same progress took place after next 6 months - 18 patient were pain free and stopped the treatment. Control tests (RTG, CT, MRI and bone scintigraphy) showed visible stabilization in bone metastases. 5 subjects were withdrawn because of progression of cancer.

Conclusions:

1. Systematic application bisphosphonates decreases the feeling of pain of bones significantly.
2. Inclusion bisphosphonates should be applied together with other methods of pain treatment.
3. Treatment using bisphosphonates does not cause the prolongation of life but increases the quality of life.

EFIC5-1000

Pain treatment (conservative): Cancer pain – Other

THE EFFICACY OF USING TAPERING DOSE OF ETORICOXIB 120MG, 90MG, 60MG, PLUS PREGABALIN IN CANCER PAIN MANAGEMENT FOR BONE METASTASES

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Background and Aims: About half of all cancer patients experience moderate to severe pain including bone pain that diminishes their quality of life by adversely affecting sleep, social relations and activities of daily living. Pain is more common in the late stages of malignancy. Cancer pain can be eliminated or well-controlled on 80% to 90% of cases by the use of appropriate drugs. The purpose of the study is to evaluate the effectiveness of using tapering dose of etoricoxib plus pregabalin in pain treatment of cancer patient for bone metastases.

Methods: 50 patients were evaluated in Pain Center, International Medical Center, KSA. They all have received an order of tapered etoricoxib: 120mg for 6 days; 90mg for 14 days; 60mg for 7 days. Patients were then sustained to 60mg as per medical condition; plus pregabalin: 150mg per oral two times daily as needed for a period 6 months. **Inclusive Criteria:** 26 females, 24 males; ages 36-76 years; mean=56. **Exclusive Criteria:** pregnant women, children, anyone who is allergic to any of the medication ingredients, history of low blood pressure, patients who have liver or kidney disease or significant cardiac and respiratory depression.

Results: Average improvement of about 60% was appreciated, as per numeric pain scale, within 7 days and sustained for at least 2 months or more, without further adjustment.

Conclusion: Using tapering doses of Cox-2 inhibitor plus pregabalin help in establishing pain relief and decrease breakthrough pain and eventually result in less centralized pain and allodynia.

EFIC5-0210

Clinical pain states: Headache (Other)

HEADACHE AMONG NURSES AND NURSING STUDENTS AND ITS LEVEL OF EFFECT ON NURSING CARE

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Background and Aims: Headache is one of the problems among nurses with intensive working environment and ongoing headache among nurses may reduce the quality of nursing care. This study was carried out to determine the characteristics of headache among nurses and nursing students and its level of effect on nursing care.

Methods: This descriptive study was conducted with 87 registered nurses and 58 bachelor-degree nursing students. The participants were asked to score the effect of headache on the quality of nursing care by using 0-10 Numeric Scale. The students were asked to consider the nursing care they give during their clinical practices.

Results: 60% of the sample were registered nurses and 40% were bachelor degree nursing students. The average score given by the nurses (6.05 ± 2.66) was statistically higher than the score (4.72 ± 2.36) of students. The nurses who were working in Oncology Department reported statistically higher scores than the nurses who were working in Surgical Inpatient Unit, Intensive Care Unit and Emergency Room. Both nurses and students who were thinking that shift working is more likely to cause headache had significantly higher scores. 64.4% of the nurses prefer to use analgesic when they have headache and this ratio was found 39.7% among students.

Conclusions: Both nurses and students stated that the headaches they experience affect the quality of nursing care given to patients. The negative effect of headache was found more intense among nurses. Work-related causes of headache should be considered by managers to avoid bad consequences in nursing care.

EFIC5-0509

Clinical pain states: Headache (Other)

THE HEADACHE IN CHILDREN WITH EPILEPTIC ENCEPHALOPATHY.

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Background. Epileptic encephalopathy - is a condition where abnormal electrogenesis of brain is the cause of disorders of the brain functions. In this condition the epileptic process itself leads to progressive brain damages.

Aim of the study. To study the features of neurological status in children with epileptic encephalopathy and to find the characteristics of headache in paediatric patients with epileptic encephalopathy.

Materials and Methods: We studied 120 children aged from 3 to 14 years, diagnosed with epileptic encephalopathy. We studied children using standard protocol: neurological examinations, Electroencephalography (EEG), and Magnetic resonance imaging.

The results of the study. All of them were suffering by acute or chronic headache and symptomatic epilepsy. Preictal headache was present in 12 (10%) patients, postictal in 30 (25%) and interictal in 60 (50%) patients. Among the patients with postictal headache 10 (33.3%) had migraine, 15 (50%) tension -type of headache and 5 (16.7%) other headaches. The study of neurological patients with epileptic encephalopathy revealed the prevalence of cognitive impairment, decreased intelligence, memory and thinking.

Conclusion. Thus, a detailed clinical and neurological analysis of patients correlated with EEG data allowed to exclude the incorrect diagnostics of epileptic encephalopathy in children. Among the patients with symptomatic epilepsy interictal migraine was commonly than other headaches.

EFIC5-0514

Clinical pain states: Headache (Other)

THE RELATIONSHIP BETWEEN HEADACHE AND ABNORMAL EEG PATTERNS IN CHILDREN WITH SYMPTOMATIC EPILEPSY

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Introduction/background

Epilepsy is one of the most complex medical and social problem at present time. Headache is a main symptom that occur before or after epileptic seizures. It has been stated that headache may represent an epileptic event. EEG abnormality is a prominent finding in children with headache.

Aim of the study

The aim of this study was to evaluate EEG abnormalities in children with symptomatic epilepsy on the background of headache.

Materials and methods.

We studied 119 children aged from 3 to 14 years, 69 of them were diagnosed with epileptic encephalopathy and 50 with symptomatic epilepsy. In this study we used clinical, neurological and instrumental methods of investigation such as EEG (electroencephalography).

Results

The study of neurological patients with epileptic encephalopathy revealed the prevalence of cognitive impairment, decreased intelligence, memory and thinking. In neurological status of patients with symptomatic epilepsy it is often revealed the predominance of focal neurological symptoms. Comparing EEG abnormalities in different types of headache revealed that there is an association between them. There was also a significant difference between EEG abnormalities in different types of aura. headache mainly was associated with the children's age.

Conclusions

Our study disclosed headache as a common symptom in children with symptomatic epilepsy. headache and abnormal EEG findings are significantly associated. Thus, a detailed clinical and neurological analysis of patients allowed us to establish the main of cause headache in children.

TEMPOROMANDIBULAR DISORDERS IN PATIENTS WITH MIGRAINE OR TENSION HEADACHES. PRELIMINARY RESULTS.

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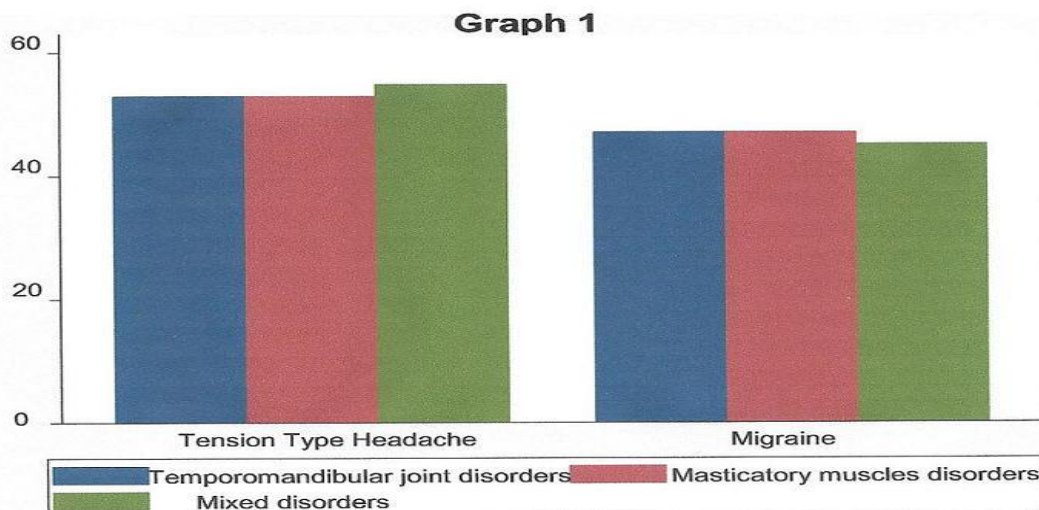
Background and aims: The Temporomandibular disorders (TMD) comprise a heterogeneous group of disorders with clinical signs and symptoms involving the masticatory muscles, temporomandibular joints (TMJ) and other head and neck anatomical structures. The main symptoms include pain in muscles or TMJs, sound during movement, malfunction of mandible mobility and headaches.

The aim of this study was to determine the prevalence of signs and symptoms of temporomandibular disorders in patients with migraine and tension-type headaches.

Methods: The prospective, open-label study was performed in a specialized pain clinic, and included patients being diagnosed with migraine or tension type headache. All participants were clinically examined according to Research Diagnostic Criteria for Temporomandibular Disorders, and completed a detailed questionnaire regarding demographics, pain characteristics, jaw disability, parafunctional oral behaviors, non-specific physical symptoms and depression, and were diagnosed with temporomandibular joint disorders, masticatory muscle disorders or combinations.

Results: The study included 38 patients, 31 women (81.58%) and 7 men (18.42%), aged 25-74years [68.51 (29.63)]. The duration of symptoms ranged from 2 months to over 35 years [14.5 (11.99)]. The two groups of patients were homogenous regarding demographic characteristics and duration of symptoms. No statistically significant differences were revealed between the type of headache and the type of temporomandibular joint disorders ($p=0.85$), masticatory muscles disorders ($p=0.47$) or mixed disorders ($p=0.75$). (Graph 1)

Conclusions: No significant differences occurred so far between patients with migraine or tension headache and temporomandibular disorders. Further research is required in order to identify possible correlations of TMDs and type of headache.



EFIC5-0780

Clinical pain states: Headache (Other)

NEUROORTHOPAEDIC SECONDARY HEADACHES PREDISPOSING FACTORS

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Aims. To detect neuroorthopaedic secondary headaches predisposing factors.

Methods. We analyzed the prevalence of secondary headaches, caused by musclotonic disorders in the cervical spine in neuroortopaedic profile patients.

Results. For the period 2006 – 2007 there were 1872 patients applied to the pain syndrome department with signs of cervicocranial pain. The mean age was 26±11,4. All patients had diverse posture disorders: thoracic scoliosis – 84%, cervicothoracic spine deforming osteochondrosis – 14,6%, antalgic scoliosis – 10,5%, posture disorders accompanied by coxarthrosis – 0,96%, flat-footedness and foot deformations – 38,5%. 41,9% patients suffered from headaches, 29,9% - from cervical spine pain, 29,5% - from both headaches and cervical spine pain. In 18,2% of patients headaches appeared to be primary.

Other patients were diagnosed with had secondary headaches, caused by musclotonic disorders in the cervical spine and accompanied with vascular disorders. In 95% of cases pericranial and shoulder girdle muscles active trigger points were detected, whereas extravascular compression signs of vertebral arteries were revealed in 56%, venous haemostasia signs in cranial cavity were found in 43% of cases.

Conclusions. Local hypertonic muscle spasm in different musculoskeletal areas may become a source of local and reflected cervicocranial pains; vascular disorders and vegetative component if accompanied worsen the pain syndrome.

THE RELATIONSHIP BETWEEN PAIN BELIEFS AND COPING WITH PAIN OF ALGOLOGY PATIENTS

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Background and aims: The patient's beliefs, expectations, attitudes of coping with pain are effective on the patient's pain control. The aim of the investigation was to evaluate correlation between pain beliefs and coping with pain of algology patients'.

Methods: This descriptive study was carried out with 201 patients at a University Hospital, Algology Clinic between 15 May-15 July 2014. The research instruments were used a Descriptive Characteristics Questionnaire, The Pain Beliefs Questionnaire (PBQ) and the Pain Coping Questionnaire (PCQ). Data were evaluated by descriptive statistical methods, Spearman's correlation, Mann-Whitney U and Kruskal-Wallis test.

Results: According to the findings; patients had duration of pain ranged from 1 month to 40 years, the average of pain duration was 68.37 ± 89.42 months. Patients' organic beliefs average score was 3.97 ± 0.78 , psychological beliefs average score was 5.01 ± 1.01 . Between patients' organic beliefs score self-management ($p < 0.001$, $r = -.388$) and conscious cognitive interventions score ($p < 0.001$, $r = -.331$) was a significant negative correlation, with a helplessness score ($p < 0.001$, $r = .365$) was a positive correlation. Between patients' psychological beliefs score and self-management score was a positive correlation ($p < 0.05$, $r = .162$). Moreover, there was significant difference between organic beliefs score and patients who use opioid analgesic.

Conclusions: Patients who have beliefs of pain's origin is a organic causes such as damage and harm in the body, cannot cope with pain and feel more helplessness. Pain beliefs should be implemented to nursing care plans on pain management.

HOW LONG DO WE NEED TO DETECT PAIN EXPRESSIONS IN CHALLENGING VISUAL CONDITIONS?

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Background and aims: Being able to detect pain from facial expressions is critical for pain communication. Alongside identifying specific facial codes for pain, there are other types of basic perceptual features. For example, early stage of visual analysis consists of the extraction of visual elementary features at different spatial frequencies (SF). Low spatial frequencies (LSFs) convey coarse elements, and high spatial frequencies (HSFs) convey fine-details. In clear and intact representations (conveyed by broad spatial frequencies, BSF), both LSFs and HSFs are available. Pain expressions could be identified in challenging visual conditions, with limited SF information. However, we do not know how efficient the LSF and HSF information is, and how fast pain could be detected. This study examined the exposure time required to identify pain from faces in intact or degraded visual conditions.

Methods: Forty-six healthy adults completed an expression identification task of pain, fear, happiness and neutral faces in the 3 different viewing conditions (i.e. BSF, LSF and HSF). Each expression was also presented for 33, 67, 150 and 300 msec.

Results: Pain expressions could be accurately identified from BSF and LSF faces presented for 33 msec, whereas the HSF pain expressions required 150 msec to be identified as accurate as the LSF pain. This was different from other tested basic emotions.

Conclusions: The LSF information (coarse elements) plays a key role in fast detection of pain, which provides the basis for pain face decoding that is progressively refined when the HSF information (fine-details) is integrated.

WHICH TYPE OF SPATIAL FREQUENCY INFORMATION DRIVES THE RECOGNITION OF FACIAL EXPRESSIONS OF PAIN – A HYBRID STUDY

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Background and aims: Facial expressions of pain could be visually analysed in terms of spatial frequencies (SFs). It has been found either low spatial frequencies (LSFs) or high spatial frequencies (HSF) could produce accurate interpretations of pain in facial expressions, and the LSFs are more efficiently utilised and play a key role in fast detection of pain. This study aims to further investigate whether LSF or HSF information is more salient for pain expression by utilizing a hybrid expression paradigm.

Methods: Hybrid faces were used to create conflict situations by merging one LSF and one HSF face, each showing a different expression. The hybrid faces make the direct competition possible by containing two independent expressions in LSFs and HSFs separately at the same time. The selected expression accordingly probes which information is preferentially perceived. Three independent groups of participants (46 participants in each group) completed 3 experiments of identifying the dominant expression of hybrid faces of pain-neutral, pain-fear, and pain-happiness, with exposure time of 33, 67, 150 and 300 msec.

Results: Recognitions of pain were biased toward LSF expression in all conditions within three experiments. The LSF bias was large when the exposure time was brief, and reduced as the exposure time increased up to 150 msec, and then remained stable.

Conclusions: The LSF information functions to form up a rapid and salient impression of expressions of pain, whereas HSFs play a more delicate role and the expressions require more time to be adequately extracted and perceived.

CLUSTERS OF BELIEFS IN CHRONIC LOW BACK PAIN PATIENTS

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Background and aims: Beliefs influence the experience of pain. The aim of the study is to identify clusters of beliefs in chronic low back patients. **Method:** Cross-sectional study conducted with a non-probabilistic sample of 82 low back pain patients, in 2014, in a Brazilian pain clinic. The following instruments were used: Chronic Pain Self-Efficacy Scale (CPSS), Tampa Scale for Kinesiophobia (TSK) and Survey of Pain Attitudes (SOPA-brief). Pearson correlation between all these beliefs were performed and were considered significant those with $p < 0.05$ and $r > 0.35$. We considered clusters three or more beliefs correlation. **Results:** Most subjects were male (51.2%), mean age of 49 years and 6 to 9 years of schooling (51.2%). The mean of pain intensity was 6 (0-10) and the mean of pain length was 100 months. The mean of Self-efficacy was 163 (30-300), Fear-avoidance was 51 (17-68). The mean scores of SOPA-brief were: Solicitude 2.5 (0-4), Emotion 2.5 (0-4), Medical cure 2.8 (0-4), Control 2.4 (0-4), Harm 1.7 (0-4), Disability 2.8 (0-4) and Medication 3.1 (0-4). We observed two clusters. Solicitude, Emotion, Disability and Fear avoidance constitute a cluster (they all correlated positively), and Self-efficacy, Harm and Fear avoidance other one (Self efficacy correlated negatively with Harm and Fear avoidance). **Conclusion:** Identifying the components of the clusters beliefs permits to plan strategies to modify the dysfunctional beliefs.

WORST OUTCOMES IN LOW BACK PAIN PATIENTS ARE RELATED TO LOW SELF-EFFICACY AND HIGHER FEAR-AVOIDANCE BELIEFS

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Background and aims: Low self-efficacy and high fear-avoidance beliefs are risks to worse outcomes in chronic pain patients. The aims of this study were assess the prevalence of low self-efficacy and high fear-avoidance beliefs in low back pain patients, and to compare pain, disability, anxiety and depression between those with and without low self-efficacy and high fear-avoidance beliefs. **Method:** Cross-sectional study with 82 low back pain adults. Brazilians pain clinic patients were assessed in 2014 by VAS, HADS, Oswestry Disability Index, Tampa Scale for Kinesiophobia, Chronic Pain Self-efficacy Scale and divided in Group 1 (high self-efficacy and low fear avoidance belief) and Group 2 (low self-efficacy and high fear-avoidance belief) and compared through pain, disability, anxiety and depression (T test). The cut point for low self-efficacy was 158 and for high fear avoidance was 42 established by ROC curves. **Results:** Most subjects were male (51.2%), mean age was 49 years, and 6 to 9 years of schooling (51.2%). About 85% of patients had low self-efficacy (163; sd=60.2) and high fear-avoidance beliefs (51; sd=7.2). The Group 2 (low self-efficacy and high fear-avoidance) was associated with higher pain intensity (6.7 ± 2.2 , $p=0.001$), higher anxiety (10.9 ± 3.6 , $p<0.001$), depression (8.8 ± 3.7 , $p<0.001$) and disability (51.3 ± 12.8 , $p<0.001$) compared to Group 1. **Conclusions:** High prevalence of low self-efficacy and high fear-avoidance beliefs were observed in this sample and they were associated with worse outcomes. Implementing strategies to try restructuring these dysfunctional beliefs are necessary and studies related to this are going on.

VALIDITY OF THE FACIAL DESCRIPTORS OF THE PAIC AMONG INDIVIDUALS WITH INTELLECTUAL DISABILITY

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Background and aims: Individuals with intellectual disability (ID) are often exposed to painful incidents and medical procedures yet studies suggest that their pain management is insufficient compared to cognitively intact peers. This may be due to difficulty in assessing pain among these individuals. The COST-action TD 1005 developed a new pain measurement tool- *the PAIC*- that rely on facial and body reactions. The aim was to analyze the facial descriptors of the PAIC and test their validity among individuals with ID and controls.

Methods: 27 adults with ID and 15 healthy controls participated. Subjects received series of pressure stimuli of varying intensities during which time the facial expressions were monitored (and retrospectively analyzed using the face items of the PAIC) and self-reports were obtained.

Results: Individuals with ID had significantly increased PAIC scores compared to controls throughout all stimulation intensities. Stimulation intensity and group type significantly affected PAIC scores. In both groups stimulation intensity correlated positively with the PAIC however only among the ID group self-reports of pain correlated significantly with the PAIC.

Conclusions: The sum total of all PAIC facial descriptors seem to be a valid indicator of the amount of pain among individuals with mild-moderate ID. Although facial expressions may replace verbal reports, increased facial expression at rest among individuals with ID may partly mask pain especially at lower intensities.

Acknowledgement: The European cooperation in science and technology (COST)- TD 1005- PainAssessment in Patients with Impaired Cognition, especially Dementia.

QUANTITATIVE SENSORY TESTS BEFORE AND 3 MONTHS AFTER ORTHOGNATHIC SURGERY

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Background and aims

The aim of this study was to objectively evaluate the inferior alveolar nerve (IAN) sensory disturbances in patients who underwent sagittal split ramus osteotomy (SSRO).

Methods

A longitudinal evaluation of the IAN sensory disturbance was undertaken preoperatively (Pre-op), the first week (Post-1W), 1 month (Post-1M), and 3 months (Post-3M) postoperatively in 14 patients who underwent SSRO. A standardized quantitative sensory testing protocol (the German Research Network on Neuropathic Pain: DFNS) was followed to record a battery of 12 parameters, which included cold detection threshold (CDT), warm detection threshold (WDT), thermal sensory limen (TSL), cold pain threshold (CPT), heat pain threshold (HPT), mechanical detection threshold (MDT), mechanical pain threshold (MPT), windup ratio (WUR), vibration detection threshold (VDT), and pressure pain threshold (PPT).

Results

In the right side, CDT at the Post-1W and the Post-3M were significantly higher than that of Pre-op. TSL at the Post-1W was significantly higher than that of Pre-op. In the left side, CDT at the Post-1W was significantly higher than that of Pre-op. HPT at the Post-1W was significantly higher than that of Pre-op.

Conclusions

These results suggest that the cold and hot sensation in the chin was damaged in early stage after SSRO. DFNS protocol appears to be one of the useful methods for the examination of neurosensory disturbance in the chin.

SOCIAL CONTEXT MODULATES FREEZING RESPONSES TO PAIN

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Background and aims: Social context has been shown to modulate several crucial pain-related outcomes (e.g., perceived pain intensity and pain-related fear). However, it is not yet known whether social context also modulates defensive responses to pain. The present study investigated the modulation of freezing responses to pain by manipulating the social context. We hypothesized that the anticipation of pain is associated with freezing responses (i.e., reduced heart rate and body motion), and that these responses are more pronounced in a threatening compared to a safe social context.

Method: Body sway, heart rate and painful facial expression were measured in 39 healthy participants while standing on a stabilometric force platform and viewing angry and happy facial stimuli (representing threatening and safe social contexts, respectively). During half of the trials a neutral sound was presented, which would be followed by an electric shock 50% of the time. (Preliminary) results: Preliminary analyses indicate that the manipulation of social context was successful as participants rated angry faces as more threatening and unpleasant than happy faces. Moreover, participants expected painful stimuli more during trials in which a sound was presented. Analyses of heart rate, body sway, and facial expressions are currently ongoing and will be presented at the meeting.

Conclusions: The present study will further illuminate the effects of interpersonal context on pain-relevant outcomes, including defensive responses to pain such as freezing. These insights are clinically relevant in that interpersonal context could be a future target for intervention to directly modulate maladaptive responses to pain.

EFIC5-0329

Human behavioural science: Pain behaviour

HOW IMPORTANT ARE FRIENDSHIPS; THE REPORTING OF PAIN TO FRIENDS VS. STRANGERS

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Background and aims

As pain is a subjective experience, it is important to ensure that pain is communicated accurately. Research suggests that the relationship between individuals experiencing pain and observers can impact on how pain is communicated; males have a higher pain threshold when females are present. The current study aimed to investigate whether the precise nature of the dyadic relationship is important when focusing on the reporting of pain.

Methods

Forty-eight dyads were recruited: 24 pairs of friends and 24 pairs of strangers. In each pair, one participant completed the pain induction task and one participant observed. Participants who completed the pain induction task verbally reported their pain threshold and pain tolerance on the cold pressor task.

Results

Overall, males had a higher pain threshold and tolerance than females. Additionally, the presence of an observer increased both pain threshold and tolerance. Pain tolerance increased more in the friend's condition than in the stranger's condition. The dyadic relationship did not affect the pain threshold.

Conclusions

Our results support research on sex differences in the reporting of pain, and adds to the literature on social communication of pain. It was concluded that having an observer present can increase pain tolerance, particularly when that observer is in the friend condition. The reasons behind the change in pain reporting need to be considered, as accurate pain reports are vital e.g. in an emergency or during General Practitioners visits.

EFIC5-0333

Human behavioural science: Pain behaviour

GIRL-FRIENDS VS. GUY-FRIENDS, WHO DO YOU REPORT MORE PAIN TO?

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Background and aims

The presence of an audience impacts on how pain is reported, but research focusing on the social relationships within an audience is limited. There is an expanding interest in the social communication of pain, however, everyday relationships like friendships have not been extensively studied in the context of pain. This study aimed to address this.

Methods

Twenty-four same-sex dyadic friends and twenty-four opposite-sex dyadic friends were recruited, with one member of the dyad completing a cold pressor task, and one observing. Participants completing the cold pressor task verbally reported their pain threshold and pain tolerance.

Results

Overall, males reported less pain than females. The presence of an observer did not have an impact on pain threshold, however, pain tolerance increased when an observer was present. Specifically, when the observer was male, the pain tolerance was higher than when the observer was female. Further analysis revealed the biggest increase in pain tolerance was observed when the participant was male and observer was male.

Conclusions

Our results support previous literature on sex differences in pain, and highlight the importance of the social communication aspect of pain. The results indicate that social relationships play a role in how pain is reported, so future research should examine why individuals report their pain differently depending on the dyadic relationship and sex of the observer. This research has wider implications, for example, when seeking treatment for pain whereby an accurate reporting of pain is paramount.

THE INFLUENCE OF TOTAL SLEEP DEPRIVATION ON MECHANICAL AND HEAT PAIN THRESHOLDS OF HUMAN TEMPORALIS AND MASSETER MUSCLES

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Background and aims: A bidirectional association between sleep and pain has been proposed. It is not known whether sleep deprivation can influence cranial muscle sensitivity in humans. The aim of this pilot study was to investigate whether 24 hours of total sleep deprivation (TSD) could affect mechanical and heat pain perception in the temporalis and masseter muscles of healthy humans and whether men and women would respond differently.

Methods: The pilot study was conducted in a small healthy adult population consisting of three women (average age: 22, range: 21-23 years) and three age-matched men (average age: 22.3, range: 20-25 years). Two experimental sessions were conducted: the first session after a night of habitual sleep (HS) and the second session after 24 hours of TSD. Pressure pain threshold (PPT) and heat pain threshold (HPT) were measured in both sessions by means of a handheld algometer and a surface contact thermode, respectively.

Results: PPT was found to be significantly lower after TSD in both temporalis ($p=0.046$) and masseter muscles ($p=0.028$), while HPT was not affected ($p>0.05$). No gender difference was found in any responses ($p>0.05$).

Conclusions: This study demonstrated that TSD significantly lowered mechanical pain perception in the craniofacial muscles regardless of the gender or selected muscles. An optimized larger trial would provide adequate information for pattern of cranial muscle sensitivity after TSD.

ACTIVITY PATTERNS AMONG PATIENTS WITH CHRONIC PAIN AFTER ORTHOPAEDIC TRAUMA

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Background and aims

Activity patterns influence the development and perpetuation of musculoskeletal pain. To date, three major patterns have been observed in particular on chronic low back pain patients: avoidance, pacing and persistence. Relationships between these behaviours and clinical outcomes remain inconclusive. Moreover, there is only few data on other chronic pain syndromes. Our aim was to identify activity patterns in patients with chronic pain after orthopaedic trauma and to describe relationships with pain, depressive symptomatology and disability.

Methods

Participants were rehab orthopaedic trauma inpatients with chronic pain (mean duration: 9 months). Activity patterns classification was made with the "Patterns of Activity Measure-Pain" (POAM-P) and the Tampa scale for Kinesiophobia (TSK). Outcomes were assessed with the Brief Pain Inventory (BPI), the Hospital Anxiety and Depression scale (HADS), the Spinal Function Sort (SFS: spinal and lower limb trauma) and the Hand Function Sort (HFS: upper limb trauma). Descriptive statistics and ANOVA were used.

Results

497 inpatients were included (mean age: 43 years; female: 22%). Patterns distribution was: 46 % avoidance; 30% pacing and 24% persistence. Kinesiophobia (TSK $\geq$ 45points) is much more marked in avoidance (71%). Nevertheless, 37% in pacing, 22% in persistence also have kinesiophobia which may suggest the existence of more than three patterns. Outcomes were always poor in avoidance, intermediate in pacing and better in persistence behaviour.

Conclusions

The 3 main activity patterns were identified in rehab orthopaedic trauma inpatients. In this setting, persistence behaviour was associated with better self-perceptions.

**PRO-NOCICPETIVE PATTERN OF EEG ACTIVITY IN SENSORY MODULATION DISORDER:
A STUDY ON ALPHA POWER**

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Background & Aims: Sensory Modulation Disorder (SMD) is characterized by life-impeding over- or under-responsiveness to naturally occurring sensory stimuli. SMD subjects evidence sensory alteration in pain processing. Decreased alpha power, and increased peak alpha frequency (PAF) of resting-state electroencephalogram (EEG) are generally reported for experimental and clinical pain. Our aim was to compare the alpha power and PAF between SMD and non-SMD subjects, and to assess their relationships to experimental pain perception.

Methods: Five minutes-long resting-state EEG was recorded in 11 SMD (35.6±6.9yrs, F=8) and in 11 (29.5±5.8yrs, F=9) non-SMD control subjects. This was followed by pain ratings of brief phasic heat stimuli delivered onto the forearm. Resting-state alpha power and PAF (7.5-12 Hz) were analyzed from fronto-central and temporal cortices.

Results: SMD subjects demonstrated higher PAF over mid-frontal (10.0±1.1 vs. 8.9±1.0 Hz, $p=0.018$) and bilateral temporal regions (left: 10.1±1.2 vs. 8.9±1.1 Hz, $p=0.031$; right: 10.1±1.2 vs. 8.8±1.2 Hz, $p=0.021$). Interaction between Pain ratings X Group were found for mid-frontal ($p=0.001$) and left temporal ($p=0.001$) regions; for the SMD subjects, higher pain was associated with lower alpha power, while the opposite relationship was observed for controls. Anxiety state contributed to the described association in the mid-frontal region.

Conclusion: SMD individuals, not considered pain patients as of yet, report hypersensitivity and pain to daily sensations, which was previously validated through psychophysical testing. Our findings of increased activity of cortico-cortical and thalamocortical feedback loops at resting-state reflect enhanced cortical excitatory processing in SMD subjects.

EFIC5-0674

Human behavioural science: Pain behaviour

NO GAME, MORE PAIN: LONG-TERM EFFECTS OF VIOLENT VIDEO GAMES ON THE ACQUIRED CAPABILITY FOR SUICIDE

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Background and aims:

Prevalence of suicid is increased in chronic pain. According to Joiner's (2005) interpersonal-psychological theory of suicidal behavior an individual acquires the capability for suicide, which consists of enhanced pain tolerance and fearlessness of death, directly through suicide attempts or in a less direct way via repeated painful and provocative events (f.e. combat experience). Recent research showed that first-person action shooter games, which just simulate such events, lead to heightened pain tolerance after gaming (Teismann et al., 2014). Based on this finding the current study investigated long term effects of habitual action shooter consumption on pain tolerance. The aim was to examine if these games possibly could contribute to increase a person's capability to enact lethal self-harm.

Method:

In a randomized double-blind experiment we compared the pain tolerance of 20 habitual action-shooter gamers to 20 males with no experience as control. Pain tolerance was assessed by the cold-pressor task. A one-way ANOVA was used to analyze significant group differences in pain tolerance, using SPSS 21.

Results:

The main effect for group (habitual action shooter gamers vs. controls) and pain-tolerance as dependent variable was significant ($p < .05$). Habitual action shooter gamers revealed higher pain tolerance than the non-gamers.

Conclusions:

Long term exposure to violent video games might be one of the painful and provocative events through which an individual can acquire the capability to engage in suicidal behavior, although gaming is not a real and active experience.

PHYSICAL ACTIVITY, ADIPOSITY AND INFLAMMATION MEDIATE THE IMPACT OF PAIN ON AUTONOMIC NERVOUS SYSTEM FUNCTION

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It is well known, that pain can lead to reduced physical activity that in turn leads to greater adiposity. Recently we've shown that vagally-mediated heart rate variability (vmHRV) is inversely related to measures of adiposity such that greater body mass index (BMI) is inversely related to vmHRV. Both, pain and adiposity are associated with greater inflammation and recently we provided evidence that vmHRV predicts inflammation. Here we tested a path- and mediation-model, hypothesizing that greater pain leads to greater BMI mediated by less physical activity, that in turn leads to greater inflammation, indexed by c-reactive protein, that finally results in reduced vmHRV. The study population consisted of employees from an airplane manufacturer located at multiple manufacturing sites in southern Germany. Cases were excluded list-wise, leaving data from a total of 507 (53 women, mean age 40.8±11.5 years) participants. Greater pain was significantly associated with less physical activity ($\beta=-0.44$, $p<.001$; $SE=0.01$), that was significantly associated with greater BMI ($\beta=-0.38$, $p<.05$; $SE=0.15$). Greater BMI was significantly associated with greater inflammation ($\beta=-0.13$, $p<.01$; $SE=0.00$), that was significantly associated with less vmHRV ($\beta=-5.6$, $p<.01$; $SE=1.82$). The total indirect effect of the path-model from pain to vmHRV through physical activity, BMI and CRP was significant ($\beta=-0.001$, $p<.05$; $SE=0.00$). The direct path from pain to lower vagal activity was still significant ($\beta=-0.44$, $p<.01$; $SE=0.15$), suggesting partial mediation. The findings highlight the importance of physical activity in individuals with pain, to prevent greater inflammation and reduced vagal-activity that in turn might lead to greater pain experience.

DIFFERENCES IN MOOD AND COPING AMONG INDIVIDUALS WITH CHRONIC CERVICAL PAIN BASED ON CURRENT PAIN STAGE OF CHANGE

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Background and Aims: Readiness to change or an individual's level of motivation to self-manage their pain has been shown to be an important predictor of clinical outcomes. The objective of this study was to examine the difference in mood and coping among individuals based on their current pain stage of change.

Methods: Participants with chronic neck pain greater than 3 months were recruited from an academic specialist pain clinic during February 2014 through February 2015. A multivariate ANOVA was conducted comparing current pain stage of change with measures of mood and coping.

Results: Individuals in the precontemplation stage had higher levels of pain related kinesiophobia ($p < 0.024$), cognitive anxiety ($p < 0.008$), and pain catastrophizing (rumination, $p < 0.039$; magnification, $p < 0.032$; helplessness, $p < 0.016$) compared to maintenance stage. Individuals in maintenance stage were less likely to use passive coping strategies compared to those in precontemplation ($p < 0.043$) or contemplation ($p < 0.036$). Alternatively, those in the maintenance stage were more likely to use active coping strategies compared to those in precontemplation ($p < 0.05$) or contemplation ($p < 0.04$).

Conclusions: The results from this study has important implications for improving clinical outcomes in chronic cervical neck pain management. The use of strategies such as cognitive behavioural therapy and motivational interviewing which promote cognitive restructuring and develop active coping strategies may help an individual's level of readiness to change.

EFIC5-0058

Pain treatment (conservative): Neuropathic pain

**THE EFFECTIVENESS OF ORAL STEROID FOR LUMBAR RADIATING PAIN. -
RANDOMIZED, BLIND, CONTROLLED TRIAL -**

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Objective : Many physicians use triamcinolone to treat acute sciatica with the hope of recovering radiculopathy. There is little clinical evidence or even no effect to support this practice. Our objective was to determine whether administration of oral triamcinolone affects the recovery of radiculopathy.

Methods : In this randomized controlled clinical trial, 40 patients were sequentially assigned to receive triamcinolone (n= 20) or gabapentine 7.5mg (n=20). Follow-up assessment was done 2 week, 6 week, 8 week and 12 week.

Results : Triamcinolone and gabapentine groups showed no statistically significant differences in physical findings, use of nonsteroidal anti-inflammatory drugs or narcotic medications, or quality of life using SF-36.

Conclusions : The impact of oral steroids on other outcomes is suggestive by this study, but its small sample size limited its statistical power.

EFIC5-0182

Pain treatment (conservative): Neuropathic pain

EVALUATION OF NEUROPATHIC PAIN ASSESSED BY THE DN4 QUESTIONNAIRE IN CARPAL TUNNEL SYNDROME ACCORDING TO ELECTRODIAGNOSTIC SEVERITY CRITERIA

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Objective: The aim of the study was to evaluate the presence of neuropathic pain assessed by DN4 (Douleur Neuropathique 4) questionnaire in a correct and quick way in patients with carpal tunnel syndrome (CTS) and to investigate the relationship between neuropathic pain and electrodiagnostic severity criteria.

Methods: 127 CTS patients were evaluated in our study. All hands were assessed by DN4 and a score of 4 and more was defined as neuropathic pain. These hands were assigned to mild, moderate and severe groups according to the results of the median nerve conduction studies.

Results: Neuropathic pain was defined in 94 (74%) CTS hands. The number of mild, moderate and severe CTS patients were 48 (37.8%), 60 (47.2%) and 19 (15%), respectively. Neuropathic pain was detected most frequently in patients with severe CTS (89.5%) whereas this rate was 75% for moderate CTS and 66.7% for mild CTS. In the evaluation of electrodiagnostic findings, significant differences were found between DN4 scores and the median distal latencies and median motor amplitudes ($p=0.022$ and $p=0.024$, respectively). Electrophysiological severity was significantly higher in CTS hands with pins and needles ($p=0.029$) and numbness ($p=0.049$).

Conclusion: The presence of numbness, tingling and prickling are the most prevalent symptoms of CTS. It is important to differentiate neuropathic pain from non-neuropathic pain in CTS to choose an appropriate treatment plan and DN4 questionnaire is a reliable, correct and quick (1-minute) screening tool in the evaluation of neuropathic pain.

EFIC5-0246

Pain treatment (conservative): Neuropathic pain

THE TREATMENT OF PAINFUL DIABETIC NEUROPATHY WITH CAPSAICIN GEL

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Background and aims: 0.075% capsaicin cream is effective in patients with painful diabetic neuropathy (PDN), but its use is limited due to skin reaction. Lower concentration (0.025%) may offer similar benefit with fewer side effects.

Objective: To study the safety and efficacy of 0.025% capsaicin gel in PDN.

Methods: A 20-week, double-blind, crossover study randomized subjects with PDN to receive 0.025% capsaicin gel or placebo gel for 8 weeks, with washout period of 4 weeks between the two treatments. Primary outcome was score change in visual analogue scale of pain severity. Secondary outcomes were score change in shortform McGill pain questionnaire (SF-MPQ), Neuropathic Pain Scale (NPS), proportion of patients who had pain score reduction at least 30% and 50%, and adverse event.

Results: Of the 33 subjects enrolled, 31 completed at least 8 weeks of the treatment period. The baseline characteristics in each group were similar. There was no significant improvement in pain with capsaicin gel, compared to placebo with VAS score (28.6 vs. 34.4, $p=0.52$). No significant difference between the groups was found in SF-MPQ (10.0 vs. 11.4, $p=0.62$), NPS (29.2 vs. 31.1, $p=0.81$). 30% and 50% pain relief was achieved in 21.8% and 16.9% of patients on capsaicin gel and 32.3% and 30.7% of patients, respectively, on placebo ($p=0.50$ and 0.77). Capsaicin gel was well tolerated with minor skin reaction.

Conclusions: 0.025% capsaicin gel is safe and well tolerated, but does not provide significant pain relief in patients with PDN.

WHAT IS THE REAL EFFECT OF PREGABALIN? DO PATIENTS SUFFER FROM LESS PAIN OR DO THEY LESS CARE ABOUT PAIN?

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Background and aims

Depression and anxiety are observed in most patients with chronic diseases such as diabetic neuropathic pain. It was reported in previous studies that both pain and anxiety scores decrease significantly after pregabalin treatment. The aim of this study is to evaluate the association between analgesic and anxiolytic effects of pregabalin treatment in patients with diabetic neuropathic pain.

Methods

The changes in pain, anxiety and depression scores before and 6 weeks after treatment with tolerable doses of pregabalin (300-600 mg/day) were compared. We used Numeric Rating Scale (NRS) for pain and Hospital Anxiety and Depression Scale (HAD) for depression and anxiety scoring.

Results

Forty-six patients were enrolled in the study. HAD scores were significantly lower in %74 of patients (n=34) and pain scores were reduced in %76,4 of this group ($p<0,001$). HAD scores were not changed in twelve patients and pain scores reduced in %83,3 of these patients ($p<0,005$). Pain scores were significantly lower in %69,5 of patients (n=32) and HAD scores were significantly reduced in %81,2 of this group ($p<0,001$). Pain scores were not changed in fourteen patients and HAD scores reduced in %58 of these patients ($p<0,001$).

Conclusions

Depression and anxiety may have an effect on pain perception process. This revives the question if impacts seen on pregabalin users depend on remedial effect of cure to pain or anxiolytic effect. According to our knowledge, this is the first study on diabetic neuropathic pain that pregabalin mitigates the pain scores independent from the anxiolytic effect.

EFIC5-0314

Pain treatment (conservative): Neuropathic pain

CAPSAICIN IS INDICATED FOR THE MANAGEMENT OF NEUROPATHIC PAIN ASSOCIATED WITH POSTHERPETIC NEURALGIA.

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Background and aims

Postherpetic neuralgia (PHN) is nerve pain that occurs following an attack of shingles. The pain from damaged nerves may feel like a sharp, burning, tingling, shooting sensation or numbness and can persist long after the shingles rash clears in immunocompetent patients, the most frequent site of reactivation is the ophthalmic division of the trigeminal nerve (herpes zoster ophthalmicus (HZO)), which can progress to involve all structures of the eye . Virulence of the VZV and the immune status of the host are primary factors leading to the development of HZ.

Methods

Patient 45 year old with leukemia treated at University Hospital FN Brno from January 2014 /one year period/. Antiviral medications such as acyclovir, remain the mainstay of therapy and are most effective in preventing ocular involvement . Intractable pain consequent to post herpetic neuralgia can be safely and successfully treated with primary and secondary analgesic, tricyclic antidepressants and anticonvulsants in combination with regional nerve blocks using local anaesthetic, includes capsaicin.

Conclusion

Qutenza is a high-potency capsaicin (8%) topical patch, labeled for treating pain associated with postherpetic neuralgia (PHN). Qutenza decreases pain sensation by reducing transient receptor potential vanilloid 1 (TRPV1) expression and decreasing the density of epidermal nerve fibers in the application area. Systemic absorption from Qutenza is low. .

Keywords: Post-herpetic neuralgia , current strategies of analgesic therapy are effective to achieve relief of pain in PHN patients and quality of life

EFIC5-0375

Pain treatment (conservative): Neuropathic pain

5% LIDOCAINE MEDICATED PATCHES IN CHRONIC POSTOPERATIVE/POST-TRAUMATIC NEUROPATHIC SKIN PAIN: A PROSPECTIVE, RANDOMISED, PLACEBO-CONTROLLED, PARALLEL-GROUP STUDY.

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Background and aims

Chronic neuropathic pain may follow any skin incision or trauma. This investigator-initiated trial (IIT) evaluated the analgesic efficacy of 5% lidocaine medicated patches on chronic neuropathic pain located at or around wound scars.

Methods

Forty-nine patients with severe neuropathic skin pain (score ≥ 5 on a weighted Numeric Rating Scale), and on a stable analgesic regimen, were randomised (1:1) to receive up to 3 additional LMPs or placebo patches. The primary endpoint was change in pain intensity (NRS scores) after 12 weeks. Secondary objectives were to investigate the effects of treatment on other pain parameters and quality of life.

Results

Median NRS scores in the lidocaine patch group decreased steadily (7.0 to 4.0), but changed only slightly in the placebo group (8.0 to 7.5). The difference in mean NRS scores (lidocaine vs placebo) increased from -0.11 to -3.49 and was statistically significant ($p < 0.0001$) from Day 10 onwards. Improved neuropathic pain symptoms were demonstrated by significantly different reductions in mean Leeds Assessment of Neuropathic Signs and Symptoms (LANSS) scores (6.0 vs 1.15), and mean Neuropathic Pain Symptom Inventory (NPSI) scores (14.43 vs an increase of 2.23). Quality of life parameters such as the EQ-5D and Patient Global Impression of Change showed progressive improvements in the lidocaine patch group, but not the placebo group. Observed side effects were moderate and limited in duration.

Conclusions

Lidocaine patches are an effective and safe treatment for severe chronic neuropathic pain, associated with significant improvement in quality of life.

EFIC5-0410

Pain treatment (conservative): Neuropathic pain

THE EFFECT OF DOPAMINE AGONIST (APOMORPHINE) ON COLD PAIN IN PATIENTS WITH CHRONIC RADICULAR PAIN

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Background and aims: Although a few small sized clinical trials suggest that dopaminergic agents reduce pain in patients with various forms of neuropathic pain (NP), the efficacy of dopamine agonists for NP remains questionable. This randomized, double blinded, placebo-controlled, cross-over study was aimed to explore the effect of the dopamine agonist apomorphine on evoked cold pain in patients with lumbar radicular NP.

Methods: Data was collected from 35 patients (18 men, 17 women, mean age 56 ± 13 years). Pain threshold and tolerance in response to immersing one hand in cold water (12°C) were measured before (baseline) and 30, 75 and 120 min subsequent to subcutaneous injection of 1.5 mg apomorphine or placebo in two separate sessions. Pain intensity and tolerance in response to application of ice pack to the most painful site in the affected leg were also tested.

Results: 120 min following apomorphine (but not placebo) injection, cold pain threshold and tolerance in the hand increased significantly compared to baseline (from 9.3 ± 6.8 to 12.1 ± 9.7 sec, $p < 0.01$ and from 31.9 ± 28.2 to 46.5 ± 52.0 sec, $p < 0.01$, respectively). Also, in the most painful site, cold pain tolerance increased (from 60.0 ± 50.1 to 74.9 ± 58.0 sec, $p = 0.02$) and the maximal cold pain intensity decreased (from 77.3 ± 22.6 to 66.2 ± 33.2 , $p < 0.01$).

Conclusions: These findings are in line with previous results from our laboratory, which showed that apomorphine prolonged experimental cold pain tolerance in healthy subjects. These findings suggest that dopamine agonists exhibit analgesic properties on evoked cold pain both in healthy subjects and in patients with NP.

EFIC5-0469

Pain treatment (conservative): Neuropathic pain

PRECLINICAL EVALUATION OF SODIUM CHANNEL BLOCKERS IN NAV1.7 MUTATIONS IDENTIFIED IN INHERITED HUMAN PAIN DISORDERS

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Background and aims:

Single nucleotide polymorphisms in the human SCN9A gene coding for the Nav1.7 voltage-gated sodium channel have been linked to chronic pain disorders such as primary erythromelalgia (EM). While non-selective sodium channel blockers have shown modest efficacy in some EM patients suggesting sodium channel blockade as a promising therapeutic mechanism, in most cases EM remains intractable to available drug treatment. There is therefore urgency in addressing pain relief for EM patients, as well as enhancing our understanding of sodium channel structure-function relationships with the ever-growing number of catalogued Nav1.7 mutations associated with EM. The goal of this study was to endeavour to build a pharmacological map of EM mutations with a longer term view to identify efficacious therapies tailored to patients' genotypes.

Methods:

By means of manual and automated patch-clamp electrophysiology on stable HEK-293 cell lines, we have assessed the effect of sodium channel blockers used in the clinic and Convergence Nav1.7 selective blockers on the biophysical and pharmacological properties of human Nav1.7 channels harbouring mutations associated with EM.

Results:

In addition to differences in channel biophysics, our data show that sodium channel blockers have different efficacy profiles in Nav1.7 mutants compared to the wildtype channel, with proprietary novel Nav1.7 blockers displaying greater activity.

Conclusions:

These encouraging results warrant the assessment of these new molecules in defined EM patient populations.

EFIC5-0519

Pain treatment (conservative): Neuropathic pain

EFFICACY OF LIDOCAINE 5% IN CHRONIC POST SURGICAL NEUROPATHIC PAIN: RANDOMIZED CONTROLLED TRIAL.

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Background and Aims:

Post-thoracotomy pain recurs or persists for at least 2 months following the surgical procedure. It is common and can affect more than 50% of adults who undergo thoracotomy, interfering with sleep. Almost 30% of adult patients suffering from chronic pain at 6-month post-thoracotomy may still experience pain 4–5 years after surgery. The aim of our RCT was to evaluate the efficacy of Lidocaine patch 5% in patients with chronic pain after thoracotomy.

METHODS:

After informed written consent, 60 patients (36-62 ys) who underwent thoracotomy from three months to three years before baseline, were recruited. Patients were randomly divided into two groups; Lido group, 32 patients were administered lidocaine patch 5% for 12 hours daily for two months and placebo group, 28 patients were administered placebo patch in the same way. NRS and sleep interference (never, 1-3mth, 1-2wk, 3-6wk, every night) were evaluated at baseline, 4 and 8 weeks. At final visit PGIC and CGIC were assessed. The frequency of analgesics and adverse effects were also examined. $p < 0.05$ was considered significant.

RESULTS:

All patients completed the study, no adverse events were recorded, NRS (baseline): Lido 6.2 +/- 1.65 vs Plac 5.8 +/- 1.90. At 4 wks (3.4 +/- 1.92 vs 5.1 +/- 1.12) and at 8 wks (2.2 +/- 1.20 vs 5.4 +/- 1.30). A significant reduction in the frequency of pain interference with sleep also occurred in Lido group.

CONCLUSION:

Lidocaine patch 5% may be considered to be an effective and safe drug for the treatment of pain after thoracotomy.

EFIC5-0543

Pain treatment (conservative): Neuropathic pain

EXTERNAL NON-INVASIVE PERIPHERAL NERVE STIMULATION TREATMENT OF NEUROPATHIC PAIN: A PROSPECTIVE AUDIT AND 3 YEAR FOLLOW UP.

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Background: External Non-Invasive Peripheral Nerve Stimulation (EN-PNS) is a neuromodulation technique in which a low frequency and short pulse width electrical current is applied via a ball shaped electrode that is placed directly onto the skin. The electrode shape and low frequency stimulation help achieve pain relief through preferential activation of superficial a-delta fibres inducing long-term depression.

Aims: To assess the clinical utility of EN-PNS in patients with refractory neuropathic pains.

Methods: Patients meeting inclusion with either a diagnosis of CRPS or neuropathic pain following peripheral nerve injury were included. Participants completed three stages of treatment: stage 1, six weekly outpatient sessions; stage 2, six-week home loan; stage 3, six weeks of no EN-PNS treatment. The primary outcome was the average post-treatment pain intensity during the last week in stage 2 compared with baseline (11-point numerical rating scale). Responders were interviewed 3 years post audit completion.

Results: EN-PNS provided significant short-term pain relief (n = 20 patients, average reduction of 2.8 numerical rating scale points, 95% CI 1.6–4.0, $p < 0.001$, intention-to-treat analysis). Eight patients (40%) improved in several outcome parameters ('responders'), including quality of life and function. At 3 years follow up: n=3 maintained EN-PNS treatment and pain reduction, n=3 did not continue EN-PNS (funding issues) reporting pain intensity return to baseline, n=1 complete pain resolution x 2 years, n=1 underwent alternative treatment.

Conclusion: EN-PNS provided significant clinical benefit for some patients. Given the refractory nature of these conditions results are encouraging although future controlled studies are required.

EFIC5-0545

Pain treatment (conservative): Neuropathic pain

SMALL MOLECULE GLIAL CELL LINE-DERIVED NEUROTROPHIC FACTOR MIMETIC BT13 SUPPORTS SENSORY NEURONS IN VITRO AND ALLEVIATES EXPERIMENTAL NEUROPATHY IN RATS

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Background. Neuropathic pain (NP) caused by nerve damage affects a significant number of adults worldwide.

Existing treatments are often inefficient or accompanied by intolerable adverse effects and do not eliminate the cause of the disease. Disease-modifying therapies against NP are highly in demand in the clinic. Neurotrophic factors supporting and regenerating damaged neurons hold considerable promise for the management of NP. Two glial cell line-derived neurotrophic factor (GDNF) family ligands (GFLs), GDNF and artemin (ARTN), that support and restore sensory neurons, were able to alleviate neuropathic pain in experimental animals. However, they have poor pharmacological properties and are very expensive for clinical use.

Aims. The goal of our study was to develop small molecules GFL mimetics to combat NP.

Methods. To achieve our goal we used a combination of rational drug design approaches and biological assays ranging from high throughput screening to animal model of NP

Results. We developed small molecules that acted similarly to GFLs: they selectively activated GFL receptors and down-stream signaling in immortalized cells and one of them called BT13 stimulated neurite elongation and sprouting of dorsal root ganglion neurons in vitro mostly via Src kinase signaling cascade. Similarly to ARTN and GDNF, BT13 dose-dependently decreased mechanical hypersensitivity in a rat model of NP. Compound was well tolerated and did not affect mechanical and thermal sensitivity and motor coordination in healthy animals.

Conclusions. Taken together, our results indicate that BT13 is a potential candidate for the development of novel disease-modifying medications against NP.

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EFIC5-0580

Pain treatment (conservative): Neuropathic pain

NEUROPATHIC PAIN IN PATIENTS WITH LUMBOISHIALGIA

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Background and aims

Patients with low back pain (LBP) accompanied by radiating leg pain were included in the presented study in order to assess (1) the ratio between the duration and the severity of LBP and leg pain (2) the frequency of neuropathic pain (NPP) perception and (3) the frequency of appropriate pharmacological treatment.

Methods

15 subjects, both male and female patients completed a baseline questionnaire. The presence of NPP has been tested with the DN4 and Pain DETECT questionnaire.

Results

Average LBP duration was 13.8 years (1-34). Pain in the lower limb has appeared in average after 6.6 years (0-21). VAS score showed intense pain in the lower limb as compared to low back pain - VAS average increased for 2 points (from -3 to 6).

In 15 participants, NPP has been detected in 13 (86.7%) using the DN4 questionnaire. The pain DETECT showed the following ratings in the evaluated group: 1 negative (7.7%), 5 unclear (38.5%) and 7 positive (53.8%). Positive NPP has been confirmed in 7 patients (46.7%). Among the 7 patients with NPP only 2 of them (28.6%) received appropriate medication.

Conclusions

Within patients with chronic LBP a pain in the lower limb appears a few years later, but is then more intensive. NPP in these patients has been confirmed in more than 50%. Appropriate treatment has been introduced to less than one-third of patients with NP pain. Therefore, more attention should be paid to the diagnosis and treatment of NPP in these patients.

EFIC5-0592

Pain treatment (conservative): Neuropathic pain

TOPICAL AMBROXOL FOR THE TREATMENT OF NEUROPATHIC OR SEVERE NOCICEPTIVE PAIN - FIRST CASE REPORTS

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Background and aims:

Ambroxol is a well-known secretolytic. Moreover, it has strong local anesthetic effects due to its potent blockade of neuronal voltage-gated sodium channels, preferrently in nociceptive neurons. In animal models of neuropathic and nociceptive pain ambroxol showed pronounced analgesic effects. Clinical efficacy on such pain states has not been described so far.

Methods:

Patients in a pain therapeutic's practice with neuropathic or severe nociceptive pain refractory to other treatment options were treated with topical preparations of ambroxol (gels or creams with up to 20% w/w ambroxol, prepared by a local pharmacist). Data from patient records were analysed. The patients gave their written consent to use their anonymised data.

Results:

Patients with otherwise treatment-refractory neuropathic or severe nociceptive pain were treated with topical ambroxol preparations. Baseline pain of up to 10 points on a 0-10 point numerical rating scale was reported. Ambroxol treatment reduced pain ratings in the majority of cases. Onset of analgesia was usually reported between 15 and 60 min and could persist for more than 6 hours. Most patients not only reported analgesia, but also recovery of every-day activities.

Conclusion:

Blockade of neuronal sodium channels has been discussed as fruitful approach to treat pain. Ambroxol has been used for decades to treat disorders of the respiratory tract (systemic single doses of up to 1 g), with high tolerability and safety. The case reports presented here demonstrate that topical ambroxol might be an interesting approach to treat patients suffering from neuropathic or severe nociceptive pain.

EFIC5-0664

Pain treatment (conservative): Neuropathic pain

THE EFFECT OF A SINGLE TREATMENT WITH CAPSAICIN 8% PATCH IN NEUROPATHIC CHRONIC LOW BACK PAIN – A PILOT STUDY

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Background and aims: The concept of neuropathic pain (NeP) in low back pain (LBP) leads to the hypothesis, that capsaicin 8% patch reduces neuropathic LBP. The aim of this study was to determine whether capsaicin 8% is an effective treatment and to identify predictors of responsiveness.

Methods: This prospective, unblinded study included 54 LBP patients with pain >3/10 on the NRS 24h before inclusion and a Pain Detect Questionnaire (PDQ) score >13 meaning possible or present (>18) NeP. At baseline pain intensity, PDQ and quantitative sensory testing (QST) were assessed as predictors. After 1h capsaicin 8% treatment on the low back NRS was assessed over 3 months. Response was determined at 1 month ($\geq 30\%$ pain reduction) and predictors were compared accordingly.

Results: Twenty-one (39%) patients responded at 1 month ($p < 0.0001$) and even 10 of the 21 responders showed a $\geq 50\%$ pain reduction. No pain reduction was seen in non-responders ($p = 0.47$). At baseline responders and non-responders did not differ in NRS ($p = 0.86$), PDQ score ($p = 0.47$), duration of pain (mean of 72.2 vs. 77.9 months) nor age. Patients' QST findings did not differ between groups.

Conclusions: Capsaicin 8% patch is an effective treatment in about 40% of chronic patients with neuropathic LBP. However, predictors for response could not be identified.

MANAGEMENT OF NEUROPATHIC PAIN IN TRIGEMINAL NEURALGIA PATIENTS WITH 8% CAPSAICIN PATCH – A PRELIMINARY CASE SERIES' RESULTS

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Background/aims: Trigeminal neuralgia (TN) is characterized by repetitive lancinating pain along one or more branches of the trigeminal nerve. The 8% capsaicin patch (8%CP) is indicated for peripheral neuropathic pain treatment. However, its efficacy in TN hasn't been demonstrated. Also the feasibility, safety and efficacy of the patch when used on the face remains to be determined. We evaluated 8%CP treatment on 8 patients with resistant TN.

Methods: Patients with 8%CP treatment were selected among all patients with TN. Clinical processes were reviewed and patients interviewed.

Results:

Age		70,88 years
Female/Male		100%/0%
Time between diagnosis and first 8%CP		47,9 months
Number of treatments(average)		3
Adverse reactions: local pain/erythema/other		12,5%/25%/0%
“Patients' Global Impression of Change” questionnaire(average)		6=“Better”
Patients discharged from pain-consultation		12,5%
Reduction in	Numerical Rating Scale(NRS)	3,25points
	<i>Douleur Neuropathique 4 questionnaire(DN4)</i>	3,16points
Patients with	Pain area reduction	62,5%
	NRS reduction	87,5%
	NRS=0	25%
	DN4 reduction	100%
	DN4=0	25%
	Opioid/anticonvulsant/antidepressant reduction	25%/75%/37,5%
	No medication	12,5%

Conclusions: Although 8%CP treatment on TN still lacks formal statement, its use in our patients was justified by the difficult pain control and our great experience with capsaicin on other peripheral neuropathic pain.

The feasibility and safety of the approach depends on the ability to fit the patch to the contours of the affected area while avoiding contact with the eyes. This treatment seems to be effective and safe for application to the facial region to treat TN, with only transient side effects similar to those previously reported for non-trigeminal cases. Further study will be needed.

TOLL-LIKE RECEPTOR 4 IN THE TRIGEMINAL SENSORY NEURONS IS INVOLVED IN TONGUE-REFERRED PAIN FOLLOWING TOOTH PULP INFLAMMATION

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The purpose of the present study is to evaluate the mechanisms underlying tongue-referred pain associated with tooth pulp inflammation through TLR4 signaling in trigeminal ganglion cells. Using mechanical and temperature stimulation following dental surgery, we have demonstrated that dental inflammation and hyperalgesia correlates with increased immunohistochemistry of neurons for TLR4 and HSP70.

Mechanical or heat hyperalgesia significantly enhanced in the ipsilateral tongue at 1 to 9 days after complete Freund's adjuvant (CFA) application to the left lower molar tooth pulp compared with that of sham-treated or vehicle-applied rats. The number of FG-labeled TLR4-immunoreactive (IR) cells and Hsp70-IR neurons in TG was significantly larger in CFA-applied rats. Three days after Hsp70 or lipopolysaccharide application to the tooth in naive rats, mechanical or heat hyperalgesia was significantly enhanced compared with that of saline-applied rats. Following successive LPS-RS, an antagonist of TLR4, administration to the TG for 3 days, the enhanced mechanical or heat hyperalgesia was significantly reversed. Noxious mechanical responses of TG neurons innervating the tongue were significantly higher in CFA-applied rats compared with sham rats to the tooth. Hsp70 mRNA levels of the tooth pulp and TG were not different between CFA-applied rats and sham rats.

These results indicate that Hsp70 transported from the tooth pulp to TG neurons or expressed in TG neurons is released from TG neurons innervating inflamed tooth pulp, and is taken by TG neurons innervating the tongue, suggesting that the Hsp70-TLR4 signaling in TG plays a pivotal role in tongue-referred pain associated with tooth pulp inflammation.

EFIC5-0743

Pain treatment (conservative): Neuropathic pain

ORAL CILOSTAZOL DECREASED PERSISTENT HYPERGLYCEMIA INDUCED EPIDERMIS DENERVATION

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Background and aims: Quantification of intra-epidermal nerve fiber density (IENFD) is a useful tool to detect injury of epidermal nerve fibers and is a reliable identification of early stage diabetic neuropathy. The aim of this study was to investigate the efficacy of oral cilostazol to preserve epidermal nerve fibers from persistent hyperglycemia induced nerve damage.

Methods: Sprague-Dawley rats 220-250g was induced with streptozotocin 60 mg/kg to diabetes. 2 weeks later, diabetic rats were subgrouping to DM group (without treatment), C10 group (DM + oral cilostazol 10mg/kg/day), C30 group (DM + cilostazol 30 mg/kg/day), and C100 group (DM + cilostazol 100 mg/kg/day) and the experiment last for 6 weeks. Hindpaws withdrawal test for thermal and mechanical stimulations were measured once each week for 2 months. The IENFD including of pan-axial marker protein gene product 9.5 (PGP 9.5), Calcitonin gene related peptide (CGRP), P2X3, TRPV-1 in hindpaws were quantified by immunohistochemistry at the end of the 2nd month.

Results: Results showed that STZ-induced DM evoked hyper-sensitive responses to mechanical but not thermal stimuli. C30 group or C100 group but not C10 group showed blunted hypersensitive responses to mechanical stimuli. Persistent hyperglycemia decreased PGP9.5, CGRP, P2X3, and TRPV-1 fibers density in hindpaws. Oral cilostazol either 30/kg or 100mg/kg reverse the decreased PGP9.5, CGRP, P2X3, and TRPV-1 fiber density.

Conclusions: STZ-induced diabetic rats present decreased IENF expression density with mechanical allodynia. Oral cilostazol administration ameliorates persistent hyperglycemia induced nerve damage.

EFIC5-0822

Pain treatment (conservative): Neuropathic pain

POST-HERPETIC NEUROPATHIC PAIN TREATED WITH 8% CAPSAICIN – 4 YEARS EXPERIENCE

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Introduction: Topical capsaicin is indicated for peripheral neuropathic pain treatment in adults. 8% capsaicin patch (8%CP) provides pain relief and avoids systemic use problems. Post-herpetic neuropathy (PHN) represents a challenge for pain physicians and is often detrimental to the patient's quality of life.

Aims: Evaluate the results of the treatment of patients with PHN, with 8%CP.

Methods: The authors performed a retrospective study. Subjects: patients diagnosed with PHN who were treated with 8%CP between 2011-2014. The results were obtained through the review of clinical files and patient's interview. Pain intensity was assessed using the Numeric Pain Rating Scale (NPRS).

Results

Patients treated with 8%CP	47
Age, mean (yrs)	66,57
Female/male (%)	42,86%/57,14%
Time between symptoms and 1 st treatment (months)	18,43
Number of treatments (mean)	2,71
Adverse reactions: local pain/erythema/others (%)	17,02%/19,15%/0%
Discharge (%)	14,89%
Reduction in NPRS score (mean)	5,43 points
Patients with NPRS score reduction (%)	100%
Patients with NPRS=0 (%)	29,79%
Reduction in DN4 (mean)	3,14 points
Patients with reduction in DN4 (%)	87,23%
Patients with DN4=0 (%)	27,66%
Patients with improvement in quality of life (%)	82,98%
Patients with reduction of pain area (%)	87,23%
Patient' Global Impression of Change (mean)	6 "Better"
Reduction in opioid therapy (%)	42,55%
Reduction in anticonvulsant therapy (%)	29,79%
Reduction in antidepressive therapy (%)	53,19%
Suspension of all therapy (%)	12,77%

Discussion and Conclusions: 8%CP seems to be a safe and effective treatment for PHN, providing rapid and sustained pain reductions and a significant reduction in concomitant medications. This can be a valuable addition to the PHN treatment armory for certain patients.

EFIC5-0873

Pain treatment (conservative): Neuropathic pain

EFFECT OF MIROGABALIN ON PATIENT-REPORTED PAIN AND SLEEP: RESULTS FROM A RANDOMIZED, DOUBLE-BLIND, PLACEBO- AND ACTIVE (PREGABALIN) COMPARATOR-CONTROLLED ADAPTIVE PHASE 2 STUDY

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Background and Aims: Mirogabalin is a preferentially selective $\alpha 2\delta$ -1 ligand intended for treatment of neuropathic pain. Efficacy and safety of mirogabalin were demonstrated in patients with diabetic peripheral neuropathic pain (*Diabetes Care*. 2014;37:3253-3261). Herein we report secondary efficacy endpoints from the same trial.

Methods: Patients (N=452) were randomly assigned to mirogabalin (5mg qd, 10mg qd, 15mg qd, 10mg bid, 15mg bid), placebo, or pregabalin (150mg bid) for 5 weeks. Mirogabalin 15mg bid and pregabalin 150mg bid were titrated from half doses during week 1. Primary endpoint was change from baseline to week 5 in average daily pain score for mirogabalin versus placebo. Secondary efficacy endpoints included patient global impression of change (PGIC), brief pain inventory (BPI) and average daily sleep interference score (ADSIS). Safety was assessed based on treatment-emergent adverse events (TEAEs).

Results: Results of PGIC (**Figure 1**), BPI (**Figure 2**), and ADSIS (**Figure 3**) assessments were generally supportive of a mirogabalin treatment effect versus placebo. No significant differences were observed for pregabalin versus placebo in any efficacy endpoint. Most frequent TEAEs for mirogabalin were dizziness (9.4%), somnolence (6.1%), and headache (6.1%); for pregabalin, somnolence (8.0%), peripheral edema (8.0%), and urinary tract infection (UTI; 8.0%); for placebo, UTI (4.6%), headache (3.7%), and vomiting (3.7%).

Figure 1. Patient Global Impression of Change at End of Treatment

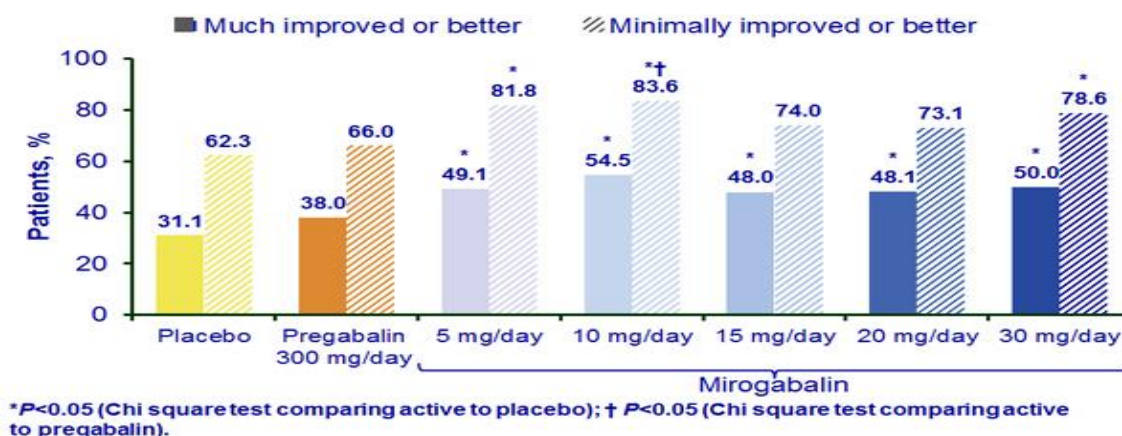
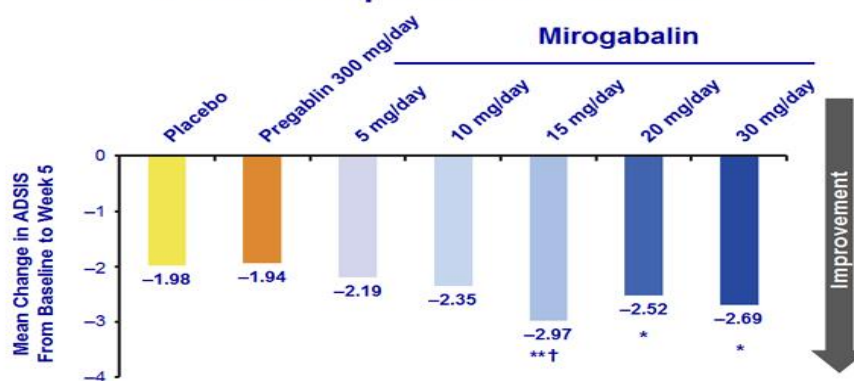


Figure 2. Statistically Significant Differences in Brief Pain Inventory Subscales Relative to Placebo

Subscale	Pregabalin 300 mg/day (n = 50)	Mirogabalin					All Dose Groups (n = 275)
		5 mg/day (n = 55)	10 mg/day (n = 56)	15 mg/day (n = 51)	20 mg/day (n = 56)	30 mg/day (n = 57)	
Interference With Daily Functions			*	*		**	**
Worst Pain Intensity				*		*	*
Least Pain Intensity				*†		*	
Average Pain Intensity			*			*	*
Pain Right Now							
Relief From Pain							

* $P < 0.05$ vs placebo; ** $P < 0.01$ vs placebo; † $P < 0.05$ vs pregabalin.

Figure 3. Sleep Interference Scores at Week 5 Compared With Baseline



* $P < 0.05$, ** $P < 0.01$ versus placebo; † $P < 0.05$ versus pregabalin.
 P values are versus placebo comparison at each visit.

Conclusion: Mirogabalin demonstrated improvements in patient-reported pain and sleep assessments compared with placebo. Improved sleep may be a clinically relevant secondary effect of reduced pain. Further research is warranted to elucidate the efficacy, safety, and patient benefit in phase 3 trials.

CASE REPORT: LOSE AND FORGET – CONTROL OF PHANTOM LIMB SENSATIONS BY CONTROL OF ALLODYNIA

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Background

Phantom limb phenomena can be difficult to treat, especially when nociceptive and neuropathic pain symptoms occur simultaneously. This presentation discusses a case of poorly controlled, phantom limb sensations which completely receded after treatment of stump-allodynia by transdermal application of capsaicine 8% patches, which is acting on C-fibre-located Vanilloid-1 (TRPV-1)-channels.

Methods

A 31yrs old female patient came to our outpatient department with chronic pain on her lower left leg: nociceptive pain in the stump, allodynia on the stump surface, and dysaesthetic phantom limb sensations for her foot which had to be amputated due to posttraumatic complications. Different regimes of antineuropathic medication had been unsuccessful, or had to be discontinued because of complications.

Stump allodynia was successfully treated by a series of three times of applications of topical capsaicin 8% patches at 3-months-intervals. Without any change in medication, residual phantom limb sensations regressed simultaneously with the loss of allodynia, and stayed absent even when gabapentin was discontinued.

Results

This case presents the successful control of phantom limb sensations by control of C-fibre-mediated neuropathy (allodynia) at the site of amputation.

Conclusions

Abolition of neuropathic sites can also abolish simultaneous neuropathic or nociceptive conditions at other sites, even phantom limb phenomena, them thus having served as trigger-areas for multi-faced pain phenomena.

EFIC5-0987

Pain treatment (conservative): Neuropathic pain

BOTULINUM TOXIN INJECTION RELIEVES TRIGEMINAL NEUROPATHIC PAIN AFTER IMPLANT SURGERY

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Background and aims: Although botulinum toxin type A (BoNT-A) may induce antinociceptive effects, behavioral evidence for the antinociceptive effects of BoNT-A on orofacial neuropathic pain has not been reported previously.

In this present study, we investigated the antinociceptive effects of BoNT-A in rats with trigeminal neuropathic pain produced by mal-positioned dental implants (MDI).

Methods: Experiments were carried out with male Sprague-Dawley rats. Under anesthesia, the left mandibular second molar was extracted, followed by the placement of a miniature dental implant to induce injury to the inferior alveolar nerve. Mechanical allodynia was evaluated by the application of air-puff pressure on freely moving rats.

Results: MDI produced obvious nociceptive behavioral changes in the rats, including a significant reduction in the air-puff threshold on the ipsilateral side of the injured site. Subcutaneous injection of 1 or 3 U/kg BoNT-A attenuated mechanical allodynia significantly [$F_{(3, 28)} = 867.597$; $p < 0.001$]. In the group treated with 1 U/kg BoNT-A, the anti-allodynic effects persisted on postoperative Day 18. A single injection of 3 U/kg BoNT-A produced the prolonged anti-allodynic effects for the entire experimental period relative to the saline-treated group.

Conclusions: In summary, the results from this study suggest that BoNT-A injection can be used for treating trigeminal neuropathic pain after dental implant surgery.

EFIC5-0989

Pain treatment (conservative): Neuropathic pain

PHARMACOLOGIC MANAGEMENT OF TRIGEMINAL NEUROPATHIC PAIN AFTER DENTAL IMPLANT SURGERY.

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Objective: Injuries of trigeminal nerve are one of the most common post-operative complications of dental implant surgery. Usually the altered sensation and neuropathic pain caused by the nerve injury is temporary but a permanent neurosensory disorder can sometimes occur. Surgery is commonly used to treat this condition but the treatment is associated with some complications with a relatively low success rate. This study examined the characteristics of pharmacological management of trigeminal nerve injury pain after dental implant surgery

Methods: Eighty five patients who visited a TMJ and Orofacial pain clinic with a history of trigeminal nerve injury pain after dental implant surgery were enrolled in this study. The pharmacologic management for trigeminal nerve injury pain was evaluated by prescribing a variety of medications for 12 weeks according to the prescription protocol in this study. The patients' pain characteristics, average percentage of pain reduction and pain relieving factors were investigated prospectively.

Results: The patients, who took anticonvulsants and antidepressants for at least 12 weeks, reported an average 24.8% reduction in pain. Interestingly, the patients who had experienced an altered sensation and neuropathic pain for more than one year also reported a reduction in pain and discomfort, with an average 17.1% decrease. In addition, it was found that early treatment using medications had a significant effect on reducing the level of pain and discomfort.

Conclusions: These results suggest that pharmacologic management can be used as an alternative for treating trigeminal nerve injury pain after dental implant surgery.

EFIC5-0992

Pain treatment (conservative): Neuropathic pain

**PHARMACOLOGICAL TREATMENT OF POSTAMPUTATION PAIN - A FIVE-YEAR REVIEW
IN RAMATHIBODI HOSPITAL'S PAIN RELIEF UNIT**

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Background and aims: Postamputation pain is highly prevalent after limb amputation. It remains an extremely challenging pain condition to treat. Although multidisciplinary pain management is recommended, pain medication is usually prescribed. The aim of this study was to retrospectively analyse type and dosage of analgesics, the pain intensity before and after medical treatment, and to review their side effects.

Methods:

Medical records of all postamputation pain patients whose pain was managed in our pain relief unit from January 2010 to December 2014 were reviewed. The pain intensity before treatment and at the time lowest pain intensity achieved was reviewed as well as analgesics and their side effects.

Results:

Sixty-five patients were included. Half of the patients (52.3%) were diagnosed with peripheral vascular disease. Stump pain was reported in majority of the patients (97%), while phantom limb pain was found in 61.5% of the patients. Pain intensity was reduced significantly at the time of lowest pain score recorded ($p < 0.001$). The median time to achieve maximum pain reduction was 30 days (IQR 7-82.5). Gabapentin was the main medication prescribed in 81.54% of the patients at a maximum dosage of 900 mg/day (IQR 500-1350). Long term use of opioids was found in 13.8% of the patients at a maximum dosage of 90 mg oral morphine/day (IQR 70-110). Most common side effect was constipation, found in 33.8% of the patients.

Conclusions:

Postamputation pain could be managed effectively by medication with a significantly decrease in pain intensity. No serious side effect was reported.

A SYSTEMATIC REVIEW OF NON-PHARMACOLOGICAL TREATMENTS FOR PATIENTS WITH PERSISTENT PAIN FOLLOWING GROIN HERNIA REPAIR

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Background and aims: GHR is among the most common surgical procedures performed worldwide and it is usually considered routine surgery. Severe persistent pain after planned GHR is a procedural complication affecting 2-4% of the patients and it is associated with development of physical and socioeconomic disability. The cause of pain following GHR is debated, but includes overlapping neuropathic and nociceptive components. A need for non-pharmacological and non-invasive treatments has been recognized, but limited scientific data are available. The aim of our review was to evaluate non-pharmacological and non-invasive interventions to manage persistent pain after GHR.

Methods: A literary search was performed using the Medline, Ovid and Cochrane databases. Studies were selected by defined inclusion criteria including the keywords: 'herniorrhaphy', 'chronic pain', 'physical therapy modalities' and 'electric stimulation therapy'. Article references were cross-checked for additional references.

Results: The search yielded 11 relevant records, and 7 studies were reviewed in full-text. Two studies were randomized controlled trials, examining the hypo-algesic effect of transcutaneous electrical nerve stimulation (TENS), primarily focusing on acute pain, but not on persistent pain. Three studies evaluated TENS, acupuncture and occupational therapy, while 2 studies examined the effect of pulsed radiofrequency, but sample sizes were very small, precluding meaningful interpretation.

Conclusions: The evidence to support the use of non-pharmacological and non-invasive interventions for the management of persistent pain following GHR, is limited. There is a need for improved study design to focus on the rehabilitation for patients with persistent pain following GHR and further trials regarding TENS are warranted.

NEUROPATHIC PAIN ASSOCIATED WITH SPINAL CORD INJURY

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Background and aims: Chronic pain remains a significant problem for many with spinal cord injury (SCI). According to Model SCI Systems the prevalence of pain ranges from 81% at 1 year after injury to 82.7% at 25 years, which can be very refractory to treatment. The purpose of this work is to report a clinical case of SCI with neuropathic pain, in order to increase the awareness of this situation and enable an improved assessment of this disorder.

Methods: A literature review was performed in order to assess the clinical and therapeutic management of neuropathic pain associated with SCI. The authors report a clinical case of a patient with neuropathic pain secondary to SCI.

Results: The authors present a sixty-six years old male patient with incomplete paraplegia secondary to SCI L4-L5 43 years ago with complains of severe and disabling pain in the lower limbs. Neuropathic pain started right after the trauma (NPS 6/10), but it's worse since 15 years ago (NPS 10/10; DN4 6/10). The patient had never done any specific treatment for neuropathic pain. He was medicated with buprenorphine 35µg/h transdermal patch and neuromodulation with pregabalin in increasing doses with good pain control (NPS 3-4; 6-exacerbations) and improvement of neuropathic signs, without side effects.

Conclusions: This case report shows that, many times, pain associated with SCI is not investigated and valued by clinicians. However, chronic pain of both neuropathic and nociceptive type is common in SCI and contributes to reduced quality of life.

CAPSAICIN 8% TOPICAL PATCH FOR CARPAL TUNNEL SYNDROME

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Background and aims: Carpal tunnel syndrome (CTS) is the most common compressive neuropathy of the upper limb, it's estimated to occur in 3.8% of the population. Capsaicin 8% patch was approved in the EU for treatment of peripheral neuropathic pain in non-diabetic adults and in the USA for postherpetic neuralgia (PHN). The purpose of this work is to report a clinical case that shows a different treatment option for refractory CTS and other possible indication for capsaicin 8% in localized neuropathic pain syndromes.

Methods: A literature review was performed about the recommendations of capsaicin 8% patch in peripheral neuropathic pain. The authors report a clinical case of a patient with CTS treated with capsaicin.

Results: The authors present a thirty-seven years old female patient submitted to open carpal tunnel release, without any surgical complications reported, that developed, postoperatively, a clinical presentation of severe pain (NPS 8/10; DN4 10/10), hyperalgesia, allodynia and paresthesias in her right hand and significant functional limitation. She was medicated with pregabalin 2x75mg; tramadol 100 mg SOS and lidocaine 5% plaster without significant improvement. So, it was proposed treatment with capsaicin 8% patch with a good response after one application (NPS 5/10; DN4 8/10).

Conclusions: Although there are few studies in the literature reporting the use of capsaicin 8% patch in other forms of neuropathic pain other than PHN and HIV-associated neuropathy, this work reports a clinical case of postoperative CTS that has improved after only one application of capsaicin with a decrease in neuropathic pain intensity.

EFIC5-1059

Pain treatment (conservative): Neuropathic pain

EFFECT OF LOW-LEVEL LASER ON THE CONTROLL OF NEUROPATHIC PAIN ON ANIMAL MODEL.

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Background and aims: Lesions of the central nervous system or peripheral could take to a kind of special pain, called pain neuropathic. The methods used for the treatment of pain for neuropathic lesions include medications, physiotherapy, psychotherapy and anesthesiological procedures and neurosurgical. Among the resources used for the physiotherapists, the Laser of low intensity is presenting good results on controlling the neuropathic pain. Due to a few studies e controversial data about the dosimetry of the laser in neuropathic pain, the investigation on the establishing of the right parameters for the application of this therapeutic resource is judged as high importance.

Methods: 50 Male Swiss mice (6 weeks old, weight 25 - 30 g) were operated by chronic constriction injury model (CCI), or sham CCI. The animals were divided into 5 groups, being allocated 10 mice in each group, and each group received the following laser doses respectively, 0J/cm², 10J/cm², 20J/cm², 40J/cm² and a sham group. The period of the experiment was 3 months, and every 15 days the evaluations were made using the hot plate test for heat hyperalgesia and mechanical hyperalgesia, the trial of Randall and Selitto.

Results: It was observed that both doses of 20J/cm² and doses of 40J/cm² showed positive results for the tests of hyperalgesia without presenting significant differences.

Conclusions: Our results showed that despite the doses of 20J/cm² and 40J/cm² presented positive results, due to the shorter time of application, it is indicated using the dose of 20J/cm².

EFIC5-0176

Clinical pain states: Orofacial pain

BURNING MOUTH SYNDROME AND FAILED RADIOFREQUENCY TREATMENT

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Aims. The Burning Mouth Syndrome (BMS) is an uncommon oral painful syndrome and unknown causes. Patients complain of mouth and tongue burning pain, oral dysesthesia but normal is physical examination. Somatic and sympathetic nerve blocks are a therapeutic choice for facial pain. We have combined sphenopalatine, maxillary and mandibular pulsed radiofrequency treatments in two patients with BMS.

Methods. Two patients affected for more than 2.5-4 years of BMS resistant to many therapies and with positive tests to sphenopalatine and somatic blocks (at least 50% pain relief) were enrolled to realize pulsed radiofrequency treatments under fluoroscopy guidance after detailed exposures. The first patient received sphenopalatine and maxillary pulsed radiofrequency treatment and the second sphenopalatine and mandibular pulsed radiofrequency combined treatment based on prevalent painful oral region. Repeated treatments were performed after 4 weeks from ineffective first treatment and patients were evaluated for pain reduction with a Numerical Rating Scale and improvement in daily life activities.

Results. All procedures were completed with poor satisfaction for patients regard to results of treatment. NRS scores were not reduced significantly at 1, 2 and 3 months and the pulsed radiofrequency treatments were not repeated at third once.

Conclusions. BMS with hidden underlying pathology is a serious therapeutic challenge for clinicians. Neurological blocks if positive for analgesic efficacy not always have a predictive value for effective pulsed radiofrequency treatments. BMS and multiple failed therapies are the rule rather than the exception and perhaps the reason for a nocebo effect.

EFIC5-0241

Clinical pain states: Orofacial pain

PROFILES OF PAINFUL NEUROPATHY IN THE TRIGEMINAL REGION

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Background and aims: Trigeminal nerve injury is one of the most distressing complications that may occur after surgery and trauma, resulting in sensory disturbances often accompanied by pain and decreased quality of life. Hence, neurophysiological changes should be recognized as early as possible to start an appropriate therapy. Therefore, we established the Quantitative Sensory Testing (QST) at chin, lip, gingiva and tongue and completed these neurophysiological investigations by questionnaires for pain estimation and psychic comorbidity.

Methods: Quantitative Sensory Testing is a non-invasive method to detect thermal and mechanical perception and pain thresholds. Thereby large and small afferent nerve fiber function will be considered, revealing hypoesthesia, dysesthesia and hyperesthesia. In case of painful sensations, hyperalgesia and the history of pain, as well as anxiety and depression (HADS-D) were monitored.

Results: QST data of patients, normalized with healthy individuals by calculating the z-transform ($z\text{-value} = [\text{value}_{\text{patient}} - \text{mean}_{\text{reference}}] / \text{standard deviation}_{\text{reference}}$), were compared. In all patients we found numbness at chin and lips coexisting with reduced temperature perception. Furthermore pain sensitization with varying severity reaching from increased mechanical pain sensitivity to obvious mechanical and/or thermal hyperalgesia could be observed. Beside this, allodynia, meaning abnormal pain experience for normally not painful stimuli and enhancement of temporal pain summation were detectable. In addition, the patients showed higher anxiety and depression scores.

Conclusion: QST accomplished by questionnaires is a helpful tool to reveal orofacial neuropathic pain. Based on the patient's profiles, a mechanism based therapy could be started and controlled for efficiency.

EVALUATION OF DIFFERENT SALIVA SAMPLING TECHNIQUES FOR PAIN MARKER DETECTION

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Introduction: Saliva is often neglected as a body fluid of diagnostic value, even though generally well accepted by the patients. This is due to lack of a standardized collection procedure. The aim of this study was to identify the ideal saliva collection technique to detect and analyse pain markers (5HT, NGF, SP, BDNF, glutamate and alfa-amylase) in healthy subjects.

Methods: Saliva and blood samples were collected from 20 healthy individuals matched for age (25±3 years) and gender. A total of five different saliva sampling techniques were evaluated during strictly controlled conditions –resting whole saliva, stimulated whole saliva, sublingual saliva, stimulated parotid saliva, sublingual saliva using oral swab. The concentration of glutamate was determined using CMA 600 Microdialysis analyzer.

Results: Large variations in glutamate levels between sampling methods was found. Higher concentration of glutamate (ANOVA with Holm-Sidak post hoc test; $p < 0.001$) was found in plasma (39.4 ± 25.4 mmol/l) and stimulated whole saliva (34.7 ± 25.9 mmol/l) compared to other collection methods ($<19.2 \pm 18.0$ mmol). There was also a correlation between whole saliva and the plasma levels of glutamate (Pearson; $r = 0.73$, $n = 20$; $p < 0.001$). Levels of 5HT, NGF, SP, BDNF and alfa-amylase are currently being analyzed.

Conclusions: Saliva is a promising diagnostic tool, but there are large variations between different sampling procedures. Whole stimulated saliva is easy to collect and show similarities to plasma regarding the glutamate level. Since biomarker level is dependent on the collection approach, only one type of collection device should be used in studies.

EFIC5-0437

Clinical pain states: Orofacial pain

ASSOCIATION BETWEEN NEUROVASCULAR CONTACT AND CLINICAL CHARACTERISTICS IN CLASSICAL TRIGEMINAL NEURALGIA: A PROSPECTIVE CLINICAL STUDY USING 3.0 TESLA MRI

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Background and aims: Previous studies demonstrated that a severe neurovascular contact (NVC) causing displacement or atrophy of the trigeminal nerve is highly associated with classical trigeminal neuralgia (TN). We aimed to describe the association between the clinical characteristics of TN and severe NVC. We hypothesized that the neuroanatomical abnormalities would be different in men and women and that severe NVC on the symptomatic side was associated to age and duration of disease.

Methods: Clinical characteristics were prospectively collected from consecutive TN patients with unilateral pain using standardized semi-structured questionnaires in a cross-sectional study design. 3.0 Tesla MRI imaging was conducted according to a special protocol and evaluated by a blinded neuroradiologist.

Results: We included 135 TN patients. Severe NVC was more prevalent in men (75%) compared to women (38%) ($p < 0.001$) and the odds in favor of severe NVC on the symptomatic side were 5.1 times higher in men compared to women (95%CI 2.3-10.9, $p < 0.001$). There was no difference between patients with and without severe NVC in current age (≥ 60 years vs.

Conclusions: Severe NVC was much more prevalent in men than in women who may more often have other disease etiologies causing or contributing to TN. Severe NVC was not associated to age or to duration of disease.

EFIC5-0445

Clinical pain states: Orofacial pain

TRIGEMINAL NEURALGIA – INTRODUCTION AND IMPLEMENTATION OF A NEW COHERENT WORK-UP AND TREATMENT REGIME.

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Background: Diagnosis and treatment of patients with classical trigeminal neuralgia (TN) lies in the hands of both medical and surgical specialties. Lack of knowledge regarding treatment strategies and the severe pain intensity render clinical management of TN challenging.

Aims: To describe the implementation of an accelerated treatment regime for TN patients at the Danish Headache Center (DHC) and to report the flow of patients during the first year after implementation.

Methods: First out-patient visit was booked 4-6 weeks after referral. Patients initially referred to the department of neurosurgery were re-directed to DHC for pre-surgical evaluation of diagnosis and optimization of medical treatment. 3.0 Tesla MRI scan was performed within 6 weeks. Patients were followed for at least two years with four fixed out-patient visits where medical treatment was adjusted and the need for referral to neurosurgery was evaluated.

Results: From May 2012 to April 2014, 130 patients entered the regime. Of these 65% continued medical treatment. 34% were referred to neurosurgery. Initial feedback from patients and clinicians about the program was very positive.

Conclusion: The newly implemented accelerated work-up and treatment regime outlined here represents, according to initial feedback from patients and clinicians, a marked improvement of our TN treatment.

EFIC5-0484

Clinical pain states: Orofacial pain

ASYMPTOMATIC WISDOM TOOTH AS A SOURCE OF REFERRED OROFACIAL PAIN

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Aim of investigation: Pain referral patterns within craniofacial region with no subjective localisation of primary site at all remains a subject of diagnostic accuracy. As a rule possible odontogenic sources should be excluded at first.

We are aimed to discuss overlooked and mistreated clinical cases of secondary/referred orofacial pain (OFP) from impacted lower third molars.

Material and methods: OFP patients (11 women, mean age 39+-2) suffered 3-6 months by earache, temple and upper jaw pain. After exclusion of odontogenic pain source all patients were treated by neurologists, otolaryngologists, and physiotherapists. Due to progression of pain, reexamination and wisdom surgery was performed.

Results: Some factors seemingly coincide with referred pain: a) no signs of expressive local inflammation - pericoronitis, b) protective muscle tenderness and palpable lymphatic nodes, c) image of impacted wisdom position shows complicated anatomy of roots related to mandibular canal. Inflamed follicular cysts were confirmed by histological examination. Mandibular block anaesthesia relieves pain. In two cases co-existing pathology of sinuses was recognised.

Conclusions: Evidence does not support the prophylactic removal of asymptomatic lower third molars to avoid nerve damage complications. Correct diagnosis and timely removal of compacted, distopic wisdom associated with disease is necessary and justified.

EFIC5-0869

Clinical pain states: Orofacial pain

**VOLUMETRIC AND CROSS-SECTIONAL OROPHARYNGEAL SHAPE ANALYSES:
TOWARDS A BETTER METRIC OF WHIPLASH-ASSOCIATED PAIN?**

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Background/Aims: Persistent pain and disability following whiplash injury, as a consequence of a motor vehicle collision, is common and incurs substantial personal and economic costs. Despite this, there is little radiological evidence in support of a structural cause of persistent symptoms in the vast majority of cases. Recent investigations have, however, observed reductions in the cross-sectional area (CSA) of the oropharynx, in patients with persistent whiplash, suggesting a possible marker of chronicity. Although interesting, their relationship to persistent symptoms, such as voice and swallow deficits, are largely unknown. Since the oropharynx is a dynamic three-dimensional organ, shape and volumetric analyses of this space may be important in predicting chronicity.

Methods: Subjects from a previous cross-sectional study (N=70; range=20-45 years old) were classified into two groups based on scores from the Neck Disability Index (NDI) at 3-months post-injury. The two groups were: control (no history of neck pain) and subjects with persistent pain-related disability (NDI>30%). We analyzed 3D MRI scans to construct volumetric measures of the oropharynx. Non-parametric t-tests, ANOVAs, and shape analyses were conducted.

Results: Whiplash CSA averaged 113.78 mm² (SE=±4.94) compared to controls (136.45 mm², SE=±9.01, p<.01). Total oropharyngeal volume among the whiplash subgroup averaged 486.92 mm³ (SE=± 27.70) versus controls (700.24 mm³, SE=±125.34, p<.05).

Conclusions: MRI measurements have indicated a 'collapsed', oropharyngeal cross-sectional area and volume in subjects with chronic whiplash, when compared to healthy controls. The data collected and methodologies utilized in this study may improve diagnosis and consequently, inform current physical medicine/rehabilitation assessment and management of persistent whiplash.

HEADACHE AND CERVICAL SPINE DISTURBANCES IN A PATIENT WITH OSTEOARTHRITIS OF TEMPOROMANDIBULAR JOINT – ONE-YEAR-FOLLOW-UP

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Background and aims: Temporomandibular joint (TMJ)-related pain also includes the craniomandibular and cervicocranial areas. The aim of this study was to determine the relationship between types of headaches and cervical spine (CS) disorders in a patients with osteoarthritis (OA) of TMJ with one-year-follow-up.

Methods: 65 patients (mean age 47.4, 95.4% women) were consecutively treated for signs and symptoms of OA of TMJ. A definitive diagnosis of OA was confirmed by magnetic resonance imaging. The patients were examined by a dentist, a neurologist, and a physiatrist-rheumatologist. Pain intensity in TMJ was shown on the visual-analogue scale (VAS 0-10). They were treated by an occlusal splint and physical therapy with one-year-follow-up.

Results: The applied treatment modalities achieved a significant reduction of pain ($p < 0.001$) in the TMJ at first examination and one-year-follow-up (mean values on VAS: 6.58 and 1.67). 46.2% of patients did not have a CS diagnosis and 53.9% of patients did not have headaches. 16.9% of them had migraines, 23.1% had CS-related headache and 6.1% of patients had tension-types headaches. Cervical syndrome was found in 10.8% of patients. 26.1% had cervicobrachial syndrome, 7.7% had cervicocephalic syndrome and 9.2% of patients had both. The SC syndrome was significant regarding the patients' age (mean age 40.8 as opposed to 53.1 years, $p = 0.0002$), whereas there were no differences for headaches.

Conclusions: The relationship of SC disturbances with the higher age of patients was determined in patients with OA of TMJ. The existence of comorbidity with headaches does not affect treatment success of TMJ.

EFIC5-0972

Pain treatment (conservative): Acute pain / perioperative pain – Opioids

THE EFFECT OF SMALL-DOSE IV KETAMINE ON POSTOPERATIVE PAIN, NAUSEA AND VOMITING AFTER PEDIATRIC ADENOTONSILLECTOMY SURGERY

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Background and aims: Adenotonsillectomy is one of the most common surgeries in children and post tonsillectomy pain and agitation management is a great challenge for anesthesiologists. The purpose of this study was to evaluate the efficacy of a single dose ketamine in the management of post-tonsillectomy pain.

Methods: In this randomized, triple blinded clinical trial, 98 children aged between 3-12 yr who was candidate for tonsillectomy were randomly assigned in one of two study groups. Intravenous paracetamol infusion (15 mg / kg) was started 15 minutes before the end of surgery, in both study groups, which was continued with the IV injection of ketamine (0.25 mg / kg) in the ketamine group and an equal volume of saline in control group. Using CHEOPS pain scale, pain and agitation score and the incidence of nausea and vomiting after surgery were recorded in 1, 6 and 12 hours after the operation. The collected data was analyzed using SPSS16 software and P value less than 0.05 was considered as significant in all cases.

Results: Comparing to control group, CHEOPS pain scale were significantly lower in ketamin group in time intervals of 1 and 6 hours after surgery (respectively $P=0.003$ and $P=0.023$) but the difference was not significant at 12 hours after operation. There was no significant difference in dose of adjuvant analgesic and the incidence of nausea and vomiting after surgery in two study groups.

Discussion: Low-dose intravenous ketamine injection at the end of adenotonsillectomy surgery, results to improved pain and agitation score in children.

DEX-TRA-04: RANDOMISED DOUBLE-BLIND TRIAL TO EVALUATE DEXKETOPROFEN/TRAMADOL 25MG/75MG ORAL FIXED COMBINATION ON MODERATE-TO-SEVERE ACUTE PAIN AFTER ABDOMINAL HYSTERECTOMY.

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Aim of Investigation: The study objectives were to evaluate the analgesic efficacy and safety of the dexketoprofen/tramadol 25mg/75mg oral combination versus the single components (dexketoprofen 25mg and tramadol 100mg) on moderate-to-severe acute pain after abdominal hysterectomy, following single and repeated-dose administration.

Methods: Randomised, double-blind, parallel, placebo and active-controlled study. Patients received 7 consecutive doses of study drug within a 3-day period, each dose separated by an 8-hour interval. A placebo arm was included during the single-dose phase to validate the pain model.

The analgesic effect of the study treatments was assessed by measuring the pain intensity, pain relief and patient global evaluation at pre-defined intervals on an eDiary and the use of rescue medication (metamizole 500mg). The primary endpoint was the mean sum of pain intensity differences (SPID), at rest, over 8 hours after the first dose.

Results: The efficacy analysis included 606 patients, with a mean age of 47.6 years (range 25-73). The study results confirmed the superiority of the combination over the single agents in terms of the primary endpoint ($p < 0.001$). Secondary endpoints were generally supportive of the superiority of the combination for both single and multiple doses.

Most common adverse drug reactions (ADRs) were nausea (4.6%) and vomiting (2.3%). All other ADRs were experienced by less than 2% of patients.

Conclusions: The study results provided robust evidence of the superiority of dexketoprofen/tramadol over the single components in the management of moderate-to-severe acute pain, as confirmed by the single-dose efficacy, repeated-dose sustained effect and optimal safety profile observed.

ABDOMINAL AND PELVIC PAIN CAUSED BY JOINT FACET SYNDROME: A BRIEF REPORT

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BACKGROUND

Some papers report abdominal and pelvic pain as symptom of vertebral facet syndrome. In the last 3 years we found 12 patients with abdominal or pelvic pain (11 female, 1 man) as main symptom of lumbar or low thoracic facet syndrome.

METHODS

When we suspected a facet joint syndrome we injected lidocaine 2% 1 ml in each of the ascribed facet and the and the pain almost disappeared in all the cases (residual pain was sometimes located in the back).

We submitted the patients to facet joint injections of triamcinolone 40 mg (total volume from 6 to 12 ml depending on the facets affected). The procedures described were Ultrasound Guided.

We gave the patients also a slow release association of oxycodone/naloxone to control the pain till the end of the treatment period

RESULTS

The NRS decrease from 8.9 ± 0.8 to 3.2 ± 1.2 at the end of the treatment. Then we suggested physical rehabilitation to reduce the risk of new pain episodes.

3 months later the NRS was still 3.9 ± 2.3 and they improved their QOL.

CONCLUSION

Most of the patients didn't mention low back pain until we asked them thus a careful anamnesis and physical exam is mandatory to identify the structures involved in the genesis of pain.

Facet joint syndrome radiated in an uncommon area as usually the pain is located in the low back and radiates down into the buttocks, this can exert, in particular in women, to unnecessary therapeutic treatment directed on the wrong target.

A GLOMUS TUMOR CAUSING ANTERIOR THIGH PAIN : A CASE REPORT

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Introduction: Glomus tumors are rare benign neuromyoarterial tumors, most commonly in the subungual location of the digit. They are clinically defined by a triad of symptoms: paroxysmal pain, pinpoint tenderness and hypersensitivity to cold. However, atypical locations and symptoms can delay diagnosis and treatment. We present a case of glomus tumor with neuropathic pain in the anterior thigh.

Case Description: A 65-year-old man visited pain clinic with localized pain in the left anterior thigh for 10 years. The patient complained of constant dull discomfort with paroxysmal lancinating pain and visual analogue score (VAS) was 80 of 100. There was no palpable mass or any skin color change but severe tenderness, dynamic allodynia and hyperalgesia were observed. Epidural, somatic and sympathetic blocks were performed under the impression of peripheral neuralgia or radiculopathy. These therapeutic procedures were not effective. And a well-circumferenced hypoechoic cyst was found following ultrasonographic examination. Local anesthetic injection directly into cystic lesion relieved of the pain for several hours. The patient was transferred to the department of surgery for excisional biopsy and results led to the diagnosis of glomus tumor. Pain was nearly (90%) disappeared until 6 months after surgery.

Conclusion: Glomus tumors of the extradigit are rare and a diagnostic challenge to the pain clinician. Because many cases are misdiagnosed in patients with neuropathic pain, further differential diagnosis must be carried out.

RISK ANALYSES OF RESPECTIVE POSITIVE AND NEGATIVE SYMPTOMS IN PATIENTS WITH DIABETIC POLYNEUROPATHY: LOGISTIC REGRESSION ANALYSIS IN JAPAN

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Background and aims: Patients with diabetes occasionally suffer from diabetic polyneuropathy (DPN). DPN patients complain of painful symptoms and negative symptoms such as numbness and dysesthesia. However, these symptoms have always been collectively analyzed to determine their risk factors. This study aimed to independently analyze the risk factors for neuropathic pain and numbness and dysesthesia in DPN patients.

Methods: 298 patients with diabetes (age, 61.1 ± 10.4 years; 176 male) were included. We determined the relationships among the incidence of DPN and its clinical parameters using logistic-regression models. Then, we applied the statistical model in two groups of DPN patients: those with pain only or both pain and the negative symptoms (pain group; 25) and those with the negative symptoms only or both pain and the negative symptoms (numbness group; 60). All logistic-regression models were adjusted for the duration of diabetes, glycosylated hemoglobin levels, and age.

Results: The depression score was higher for patients with DPN than for those without, although it did not reach an abnormal level. An abnormal Achilles tendon reflex (ATR) and insulin treatment, but not smoking, hypertension, hyperlipidemia, and diabetic retinopathy, were associated with DPN. Further, we found female as a risk factor of DPN pain-group, found abnormal ATR and insulin treatment as risk factors of DPN negative symptom-group. Overweight and obesity were common risk factors in both groups.

Conclusions: The positive and negative symptoms of DPN have independent risk factors, suggesting different underlying mechanisms and the need for separate diagnosis and treatment.

EFIC5-0046

Clinical pain states: Neuropathic pain

QUALITY OF LIFE: DATA FROM AN EFFICACY TRIAL WITH 5% LIDOCAINE MEDICATED PLASTER (5%LMP) IN POST-HERPETIC NEURALGIA (PHN)

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Background and aims

One-dimensional pain scales (e.g. 11-point Numeric Rating Scale (NRS)) have been extensively used in clinical trials to demonstrate efficacy of pain treatment. However, secondary endpoints to demonstrate improvement in Quality of Life (QoL) become more and more important in trials targeting to support approval of new compounds.

The aim was to assess whether topical treatment with 5% LMP can provide additional clinical benefit to patients suffering from PHN beyond effects seen with the NRS pain scale.

Methods

265 patients suffering from PHN were treated for up to 10 weeks with 5%LMP. A quality of life questionnaire (SF-36®) was completed at screening and after 8 weeks. The SF-36® Health Survey is the most widely used patient-based health status survey in the world measuring health status and outcomes from the patient's point of view. The scales assessed limitations in physical activities due to physical health problems, bodily pain, general health perceptions, vitality (energy and fatigue), and limitations in social activities because of emotional problems and mental health. The analysis covered all patients independently from their NRS response to 5%LMP.

Results

After 8 weeks the mean scores improved in all scales assessed. A more pronounced increase was observed especially for body pain, vitality and social functioning.

Conclusions

Results of this efficacy trial demonstrated beneficial effects of 5% lidocaine medicated plaster in chronically ill patients suffering from PHN for more than 3 years.

In addition to pain relief a marked improvement in quality of life was demonstrated.

EFIC5-0062

Clinical pain states: Neuropathic pain

THE USEFULNESS OF THREE PHASE BONE SCAN AND THERMOGRAPHY FOR MAKING THE DIAGNOSIS OF CRPS-1

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Background: CRPS is painful and disabling disease, yet the diagnosis of this can be difficult to confirm by purely objective measures. therefore, we performed three phase bone scan(TPBS) and thermography as a work up in order to determine their predictive value and usefulness for making the diagnosis of CRPS

Methods: 44 patients who had been diagnosed with CRPS-1, according to the modified criteria, were evaluated. all the patients were examined by performing a TPBS and thermography as part of a work up for diagnostic confirmation. the diffuse increased tracer uptake in delayed image(phase 3) was estimated by positive findings. the findings were considered positive for CRPS. if the thermographic findings showed temperature asymmetries between the affected and non affected extremities of more than 1.00C

Results: A review of TPBS for 44 patients indicated that 16 patients(36.4%) had diffusely positive scans, and thermographic abnormalities were noted in 35 of 44 patients(79.5%)

Conclusions: the use of thermography in clinical settings can play an important role in diagnosis of CRPS. however a TPBS alone cannot provide a completely accurate diagnosis, so it is imperative that the TPBS data be integrated with the clinical evaluation and the other relevant tests

EFIC5-0070

Clinical pain states: Neuropathic pain

UNIQUE MECHANISM FOR MUSCULOSKELETAL PAIN DEFINED FROM PRIMARY CARE RESEARCH INTO ENTHESIS RESPONSE CAUSED BY BIOMECHANICAL STRESS.

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BACKGROUND AND AIMS

The enthesis has been ignored by many researchers due to the belief there are few nerves and blood vessels there. The work of Benjamin and McGonagle has defined the entheses changes and 12 years of clinical work by Australian and Bulgarian musculoskeletal doctors has now elucidated a possible mechanism.

By defining how the entheses become innervated and vascularised following biomechanical trauma, resulting in a complex that explains Bogduk's hypothesis that 'all musculoskeletal pain may be neuropathic'.

METHOD

By collating research information on disc degeneration and neoneural formation, plus the harvesting of cartilage and bone grafts from periosteal elevation and the biomechanical triggered changes occurring at the entheses;

added to observations of the effects of multiple stabbing injections to the painful entheses in 4000 patients, resulted in immediate amelioration of signs and symptoms and restoration of function.

RESULTS

Entheses injected were at the lower lumbar, sacrum and coccyx attachments of the ilio-lumbar fascia and other palpable painful entheses.

First result was restoration of functional range of movement and loss of enthesal tenderness.

Second was reduction of the brain 'pain perception'. **Third** was restoration of quality of life measures.

CONCLUSIONS

Biomechanical damage to the entheses gives rise to activation of the periosteal pluripotent cells to start the repair process which includes neovascularisation and neoneural development and new cartilage then bone formation as a reinforcement to strained tissues.

This unique mechanism may define the cause of Musculoskeletal Pain Syndromes as Neuropathic Enthesalgia.

EFIC5-0075

Clinical pain states: Neuropathic pain

ANTIHYPERALGESIC EFFECT OF GABAPENTIN, QUERCETIN AND A SIGMA-1 ANTAGONIST IN A MODEL OF NEUROPATHIC PAIN IN RATS.

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The treatment of neuropathic pain is performed according to the etiology, the most used drugs are neuromodulators, however exist others that may be potentially useful. The aim of this study was to evaluate and to compare the antihyperalgesic effect (efficacy and potency) of 3 different drugs in a model of neuropathic pain. The antihyperalgesic effects of gabapentin, quercetin and BD-1063 (sigma-1 receptor antagonist) were determined after single-doses, using the von frey test in a rat model of neuropathic pain (Benett model). In all cases the antihyperalgesic effects increased in a dose-dependent manner. The time-course analysis shows that gabapentin (100 mg/kg) reached its maximum effect at 60 min after the treatment, producing an anti-hyperalgesic effect of 91.25 ± 6.70 % whereas quercetin (177 mg/kg) and BD-1063 (56.2 mg/kg) produced their maximum effect antihyperalgesic at 90 min with 76.67 ± 6.15 % and 73.33 ± 8.02 % respectively. This antihyperalgesic effect remained during 180 min of observation. Analyzing dose-response curves gabapentin showed the greater efficacy. Quercetin exhibited similar efficacy to BD-1063. For its part regarding the analysis of pharmacological potency, we compare the ED₅₀, the order of potency from highest to lowest was Gabapentin > Bd-1063 > Quercetin. These results suggest that although there are other drugs that may be useful for the treatment of neuropathic pain, gabapentin appeared to be the most potent and effective of the assayed compounds at least in the anti-hyperalgesic effect, so it remains one of the drugs of first choice and reference to evaluate new drugs.

EFIC5-0076

Clinical pain states: Neuropathic pain

ANTI-HIPERALGESIC EFFECTS OF DICLOFENAC AND GABAPENTIN IN NEUROPATHIC PAIN INDUCED BY CHRONIC CONSTRICTION INJURED.

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Neuropathic pain affects 7-8% of world population and at the moment there is not appropriate treatment to relief this condition. The aim of this study was to analyze the anti-hyperalgesic interaction of several combinations of diclofenac (0.1, 0.3, 1.0, 3.2, 10 mg/kg) and gabapentin (10 mg/kg) orally, evaluating their effects in individual and combined administration. It was used the von Frey test (hyperalgesia) in a model of neuropathic pain in rats (Bennett model). It was evaluated their adverse effects on weight change and gastric damage. Results in time course analysis, dose-response curves, and global effects as area under the curve, indicated that diclofenac did not show a dose-dependent effect and only specific doses showed a tendency to reduce neuropathic pain produced by chronic constriction injured (CCI), whereas the diclofenac and gabapentin combination showed subadditive effect. About determination of adverse effects, the weight of animal's decreases with higher doses; gastric damage is fewer with drugs combination. These results suggest that diclofenac given anti-hyperalgesic effect, while that combined with gabapentin shows subadditive effect in neuropathic pain model by CCI.

OBESE NEUROPATHIC PAIN PATIENTS COMPLAIN OF MORE SEVERE PAIN INTENSITY THAN NORMAL-WEIGHTED NEUROPATHIC PAIN PATIENTS

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Background : Overweight negatively affects musculoskeletal disorders, and thereby, obesity is known as one of risk factors for osteoarthritis and chronic low back pain. It has not been reported whether neuropathic pain, usually unrelated to weight-load to the musculoskeletal system, is associated with overweight.

Methods : Forty-four neuropathic pain patients, with varied etiologies, were divided into two groups by body mass index(BMI), using 25 as the cut-off value:. The overweight group (n=14, BMI=29.4±4.6 [mean±SD]) and the normal weight group (n=30, BMI=21.7±1.8). Pain severity was evaluated by an 11-point numeric rating scale (NRS), the Neuropathic pain symptom inventory (NPSI). The short form (SF)-36 was used to evaluate health-related QOL. Data of the two groups were compared by the Mann-Whitney test, and p<0.05 was considered statistically significant.

Results : NRS of the overweight group was 7.4±2.1, which was significantly higher than the normal weight group (5.8±2.4, p<0.05). The NPI total score and its subtotal of 'paroxysmal pain' turned out to be significantly higher and also neuropathic negative symptoms tended to impair in the overweight group. However, both physical and mental health statuses of SF-36 were comparable between the two groups.

Conclusion : The severity of neuropathic pain, which had arisen without any influences from musculoskeletal damages due to overweight, was more severe in the overweight and obese patients. Our findings might indicate the peripheral nerve lesion itself is worse and pain threshold has become lower in the obese patients.

PROFILE OF NEUROPATHIC PAIN IN PATIENTS WITH POST LAMINECTOMY SYNDROME

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Background and aims: The post laminectomy syndrome presents both nociceptive and neuropathic pain components. This study was to evaluate for the presence of the neuropathic component in patients diagnosed with PLS at a multidisciplinary Pain Clinic. **Methods:** Clinical observational study, using the neuropathic pain diagnostic questionnaire (DN4), visual analog scale (VAS), the Tampa Scale for Kinesiophobia (TSK), which probes for fear of movement, and of the WHOQuality of Life-BREF (WHOQOL-BREF), for assessing quality of life, in a sample of patients with complaint of pain following surgical procedures in the lumbar vertebral column for back pain, resulting in feelings of vulnerability to pain and handicapping, compromising quality of life. Were included patients with a VAS score ≥ 5 . **Results:** On VAS, 28 out of 43 patients (65%) referred a pain score ≥ 5 , with a medium VAS score of 6.5 ± 1.4 , with a female predominance, medium age of 38.3 ± 5.3 , 40% married, a medium of school years of 9 ± 3.5 . The description of pain as electric shock was present in 51.4% (n=14), followed by burning in 32.5%, and painful cold in 16%. The TSK index was 39.9 ± 9.8 (elevated) and the domains mostly affected in the WHOPOL-BREF were the physical, with 47.8 ± 9.8 , and the psychological, with 49.1 ± 2.4 .

Conclusion: The history and the findings from clinical questionnaires give major elements in guiding interventions aimed at betterment of quality of life, emphasizing the need for a detailed characterizing of the pain experience reported by the patient.

EFIC5-0198

Clinical pain states: Neuropathic pain

DIABETIC TRUNCAL NEUROPATHY – CASE REPORT

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Introduction: Diabetic truncal neuropathy is a focal neuropathy, which occurs in elderly patients with mild form of long-lasting diabetes mellitus. It is developing gradually with unilateral pain, covering one or more adjacent dermatomes of the chest or abdomen (Th4-Th12 level).

Case report: A 70 year-old female patient came to the clinic due to left- sided chest pain lasting for 6 months. Pain was developing gradually, usually during the night. The patient was already examined by general practitioner and cardiologist, and submitted to workup (blood, urine, electrocardiogram, echocardiography of heart, computerized tomography of chest, magnetic resonance imaging of the thoracic spine, ergometry) which did not reveal any reasonable explanation for the symptoms. She was treated with acetaminofen and nonsteroid antiinflammatory drugs, without significant improvement. Neurological examination revealed left-sided hyperaesthesia of the dermatomes Th4 and Th5.

The patient had type 2 diabetes for 20 years that was well controlled with oral antidiabetics.

The gabapentin has been gradually introduced to therapy (3x300 mg), pain was significantly reduced, with full resolution after four weeks.

Conclusion: Diabetic truncal neuropathy can imitate many diseases of the chest, abdomen and spinal canal. Diagnosis is based on neurological examination and exclusion of other conditions. Chronic neuropathic pain treatment is the most effective (anticonvulsants, antidepressants) while conventional analgesics are mostly ineffective.

EFIC5-0252

Clinical pain states: Neuropathic pain

COMBINED TAPENTADOL AND RADIOFREQUENCY THERMORIZHOTOMY IN MANAGEMENT OF POSTHERPETIC NEURALGIA

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Aims. A combined treatment by peripheral radiofrequency thermorizotomy at lower temperature and incremental doses of tapentadol, a drug stimulating inhibitory μ -opioid receptors and mediating noradrenaline reuptake inhibition, can modify the course of a difficult painful syndrome like PHN.

Methods. Eight patients with resistant and disabling PHN (5 trigeminal, 3 intercostal) had been enrolled. Peripheral radiofrequency thermorizotomy at lower temperature (less 60 °C) of supraorbital and infraorbital divisions of trigeminal nerve and of intercostal nerves were combined with beginning of tapentadol therapy with 50 mg orally every 12 hours and titrated in 50 mg increments in a minimum of 3 day intervals until 100 mg to 150 mg orally every 12 hours. Clinical effectiveness, intensity and frequency reduction of pain, neurologic exam, disability were recorded at weekly and monthly visits until 6th month.

Results. After four weeks 6 patients declared reductions in burning pain and allodynia with change in the pain scores and improved quality of life. At 6th month 4 patients had good relief of neuropathic pain. Only 3 patients needed of 300 mg daily of tapentadol for a long period and always 3 have repeated peripheral radiofrequency thermorizotomy. There have been two minor areas of hypoesthesia in 2 patients after peripheral radiofrequency thermorizotomy.

Conclusions. Tapentadol can be effective in combined treatment of intractable PHN with peripheral radiofrequency thermorizotomy at lower temperature. Peripheral radiofrequency thermorizotomy modifies the pattern of neuropathic disease in PHN and together with tapentadol can reduce disability of patients and improve quality of life.

EFIC5-0262

Clinical pain states: Neuropathic pain

DEFICIENT PAIN MODULATION AMONG CENTRAL NEUROPATHIC PAIN PATIENTS IS DIFFERENTIALLY ASSOCIATED WITH PAIN CHARACTERISTICS

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Background: Approximately 50% of individuals with spinal cord injury (SCI) develop central neuropathic pain (CP) in body regions at and below the level of injury. The pathophysiology of CP is not established and therefore tailoring an effective treatment is currently a challenge. We hypothesized that CP is associated with alterations in the pain modulation system and the aim was to test this hypothesis.

Methods: Participants were 49 individuals with SCI (27 with and 23 without CP) and 20 healthy controls. Psychophysical testing included the measurement of conditioned pain modulation (CPM), pain habituation, temporal summation (TSP) and spatial summation of pain (SSP). Data on CP was collected and correlated with the psychophysical indices.

Results: The two SCI groups exhibited reduced pain habituation compared to healthy controls. However, among SCI individuals with CP the magnitude of CPM was significantly reduced ($p < 0.05$), and temporal summation was significantly increased ($p < 0.01$) compared to SCI subjects without CP and controls. CPM and habituation correlated significantly with the number of painful body regions below the lesion ($p < 0.05$ for both) and SSP correlated significantly with CP intensity ($p < 0.05$).

Conclusions: SCI individuals with CP appear to exhibit poorer pain inhibition capabilities than those without CP and healthy controls, which is associated with the *extent* of CP below the lesion. Greater pain summation capabilities are however, associated with the *intensity* of CP.

EFIC5-0372

Clinical pain states: Neuropathic pain

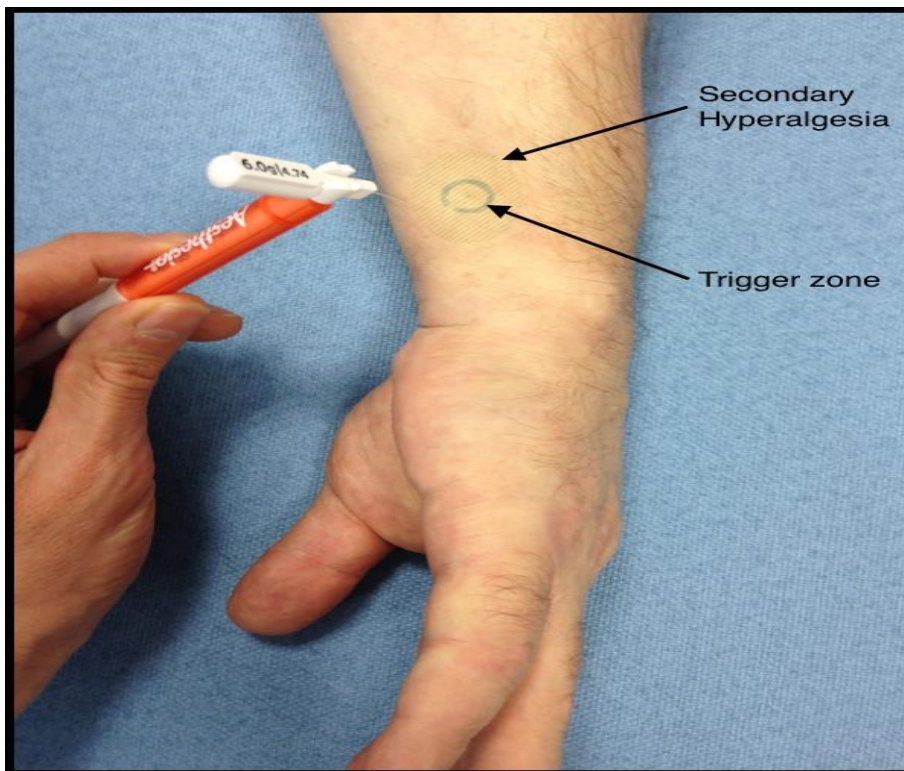
5 YEARS DURATION NEUROPATHIC PAIN DUE TO A GLOMUS TUMOR OF THE FOREARM.

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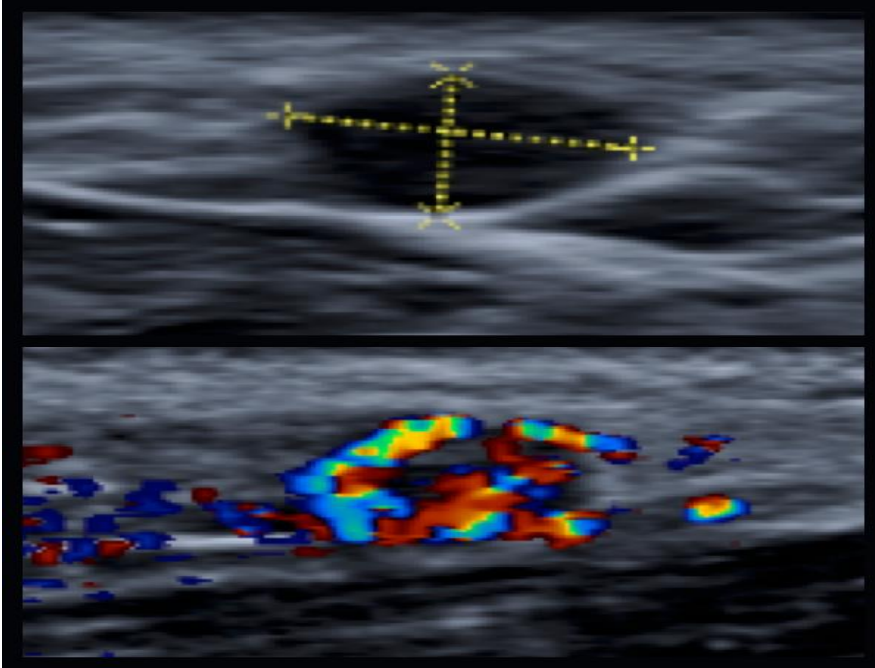
INTRODUCTION: We report the case of a neuropathic pain of the forearm due to a rare localization of glomus tumor.

CASE REPORT: A 60 year-old male patient complained of constant and severe skin pain of the distal intern part of the right forearm. He did not respond to usual analgesics and was referred to a first chronic pain center. A neurinoma of the branch of the medial antebrachial cutaneous nerve was suspected but the MRI was considered normal. Capsaicin 8% cutaneous patch was proposed twice at 3-month interval with no improvement. At the first meeting, the patient complained of pain described as needles, burning, tingling, 'sharp electric shock' and 'hammer blow'. He was worse on cold exposure. Physical examination found no skin abnormality but at careful palpation a nodule of 5x5mm with a trigger zone. There was severe mechanic dynamic, static, and cold allodynia.



Ultrasound doppler showed a round hypoechogenic mass of vascular nature, and a new MRI an arteriovenous

malformation.



The lesion was removed. Histological examination showed a glomus tumor. The patient remained fully asymptomatic.



DISCUSSION: Glomus tumor is a rare and benign tumor of the neuro-myo-arterial glomus, usually found beneath the fingernails. It has a small size but can cause extreme pain: nevralgic and neuropathic pain with secondary hyperalgesia is discussed.

CONCLUSION: Glomus tumor can cause severe pain with delayed diagnosis. We report an unusual localization. This case emphasize the necessity of careful physical examination.

EFIC5-0395

Clinical pain states: Neuropathic pain

ELECTRO-ACUPUNCTURE FOR TREATING PAINFUL DIABETIC NEUROPATHY: A MULTI-CENTER, RANDOMIZED, ASSESSOR-BLINDED, CONTROLLED TRIAL

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Background and aims

Painful diabetic neuropathy (PDN), one of the most common chronic complications of patients with diabetes. The purpose of this study is to conduct the effectiveness and safety of electro-acupuncture on PDN.

Methods

This study is a multi-center, randomized, assessor-blinded, controlled trial. 126 participants with a ≥ 6 month history of PDN and a mean weekly pain score of ≥ 4 on the 11-point Pain Intensity Numerical Rating Scale (PI-NRS) will be assigned to the treatment group (n = 63) or control group (n = 63). The participants in the treatment group will receive electro-acupuncture with a mixed current of 2 Hz/120 Hz at 12 acupuncture points (bilateral ST36, GB39, SP9, SP6, LR3 and GB41) twice per week for eight weeks as well as the usual care. The participants in the control group will not receive electro-acupuncture during the study period and will receive only the usual care. PI-NRS score at the 9th week will be the primary outcome measurement and the Short-Form McGill Pain Questionnaire, a sleep disturbance score, EQ-5D, nerve conduction study and Patient Global Impression of Change will be used as secondary outcome measurement. Safety will be assessed at every visit.

Results & Conclusion

This trial is currently recruiting participants. The results of this trial will provide a basis for the effectiveness and safety of electro-acupuncture on PDN.

Acknowledgements

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Trial registration

Clinical Research information Service. Unique identifier: KCT0001135.

EFIC5-0396

Clinical pain states: Neuropathic pain

NEUROPATHIC PAIN COMPONENT UNDER MUSCULOSKELETAL DISEASES

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Neuropathic pain caused by the musculoskeletal diseases has recently been the focus of numerous studies.

The aim of this study was to estimate the structure of pain syndrome and reveal the presence of c component in patients suffering from the musculoskeletal diseases.

Material and Methods. We've examined 68 patients aged 45-85 years (average age 67,6 ±1,3years). Patients were divided into 3 groups: A – patients with osteoporosis and vertebral fractures (N=29), B – patients with low back pain (N=22), C – patients with osteoarthritis of major joints (N=17). To assess the NP component we used painDETECT, LANSS, DN4 questionnaires.

Results. Regression analysis shows correlation between the questionnaires: LANSS and painDETECT ($r=0.73$, $p=0.000001$), DN4 and painDETECT ($r=0.73$, $p=0.000001$). 63,6% of patients with osteoporosis examined by painDETECT were unlikely to have the NP component, 17,2% might possibly, 17,2% – probably. LANSS scale: 24,1% were probably to have NP. DN4 scale: 37,9% probably had NP. 63,7% of patients with low back pain examined by painDETECT were unlikely to have NP, 22,7% might possibly, 13,6% – probably. LANSS scale: 22,7% were probably to have NP. DN4 scale: 36,4% had probably NP. 64,7% of patients with osteoarthritis of major joints examined by painDETECT were unlikely to have the NP component, 29,4% might possibly, 5,9% - probably. LANSS scale: 23,5% probably had NP. DN4 scale: 41,2% had probably NP.

Conclusions. Thus, in patients with musculoskeletal diseases the pain syndrome may include NP features. Identification of these would promote a treatment strategy targeted at the NP.

EFIC5-0406

Clinical pain states: Neuropathic pain

DRUGS FOR NEUROPATHIC PAIN: EVIDENCE SUMMARY FROM COCHRANE SYSTEMATIC REVIEWS

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Background and aims: The Cochrane Library contains 24 systematic reviews reporting oral or topical drugs for neuropathic pain treatment. Most used consistent and contemporary evidence levels. The aim was to summarise the reliable and robust evidence available.

Methods: Review of systematic reviews available on the Cochrane Library. Analysis was according to neuropathic pain condition using three tiers of evidence. First tier: $\geq 50\%$ pain intensity reduction [PIR], no imputation, ≥ 8 weeks, >200 participants; second tier: >200 participants but one other condition not met; third tier: <200 participants, other significant problems because quality standards not met.

Results: No first tier evidence was available for any treatment. For 14 oral or topical drug treatments, there was only third tier evidence: either no data or data insufficient in both quality and quantity to make any reliable judgement about efficacy in any neuropathic pain condition. Second tier evidence was available to show lamotrigine to be ineffective, and to provide estimates of efficacy for duloxetine, gabapentin, lacosamide, pregabalin, and topical capsaicin 8% patch in one or more of painful diabetic neuropathy, postherpetic neuralgia, HIV neuropathy, and central neuropathic pain. NNT values ranged between 4 and 11. Tramadol is probably effective, but there is no evidence on efficacy for other conventional opioids.

Conclusions: The dearth of high quality evidence to provide robust estimates of efficacy across particular neuropathic pain conditions for any drug is startling. Only for duloxetine is non-Cochrane data available that fulfils all evidential requirements to avoid bias.

EFIC5-0447

Clinical pain states: Neuropathic pain

WORST PAIN SEVERITY SCALE ON THE MODIFIED BRIEF PAIN INVENTORY IS ASSOCIATED WITH CLINICALLY IMPORTANT DIFFERENCE ON THE PATIENT GLOBAL IMPRESSION OF CHANGE

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Background and Aims: A reduction of approximately 30% on an 11-point numeric pain intensity rating scale (PI-NRS) has been considered as a clinically important difference by relating it to the patient global impression of change (PGIC). Our objective was to examine the association of the 11-point worst pain severity scale (WPSS) of the modified Brief Pain Inventory (M-BPI), a validated and widely used measure, with the PGIC.

Methods: Data of 452 randomized subjects with diabetic peripheral neuropathic pain (DPNP) from a double-blinded, placebo-controlled phase 2 study were analyzed. M-BPI data were collected weekly and PGIC data were collected at the end of treatment. Logistic regression analyses were used to derive receiver operator characteristic (ROC) curves to describe the sensitivities and specificities of WPSS score change or percent change from baseline in predicting clinical improvement categories, i.e., 'minimally improved' or better, 'much improved' or better, and 'very much improved' based on PGIC.

Results: WPSS in the M-BPI was associated with clinically meaningful PGIC improvement. The areas under the ROC curves for the WPSS change/%change from baseline were generally high (ranging from 0.78-0.82) for each definition of clinical improvement. Similar to the PI-NRS, a change of -3 or a percent change of -33.3% from baseline in WPSS was best associated with "much improved" or "very much improved" PGIC categories.

Conclusions: Results from this analysis suggest that the WPSS may be used to describe a clinically important difference in patients' assessment of DPNP. Findings will be validated in a larger study.

EFIC5-0520

Clinical pain states: Neuropathic pain

OXYCODON AND PATIENTS' QUALITY OF LIFE IN DIABETIC POLINEUROPATHY

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BACKGROUND AND AIMS:The purpose of this article is to emphasize deminution of daily activities and quality of life with radiculopathy in the region of L4 to S1 dermatoma,diagnosed painful diabetic polineuropathy, using oral oxycodon therapy as well as tramadol therapy.

METHODS:Analysing 30 patients,we introduced Pain Detect questionnaire, patient history, Short Form -36 questionnaire.Furthermore,duplex doppler sonography,anklebrachial index measurement and electromiography were used.Dividing patients into two groups average aged 45 to 80,we have been observing oral oxycodon therapy with visual analog scoring >8 as inclusion criteria and oral tramadol therapy, using visual analog scoring >6 as inclusion criteria. We controlled them through the period of three months with one month round.We were analysing degree of pain, mood,mobility,side effects.

RESULTS:We treated patients with oral oxycodon therapy in average daily dose of 20 mg.Furthermore, we treated them with oral tramadol therapy in average daily dose of 300 mg, combined paracetamol and antiinflammatory nonsteroid drugs. Common side effects like nausea, dizzines and constipation we treated symptomatically.

CONCLUSION:Well-founded oxycodon therapy is the opportunity for better phychological functioning. In relation to physical status optimization, we have been detecting better mobility, rarely nocturnal pain.Calfs' arteries classified damaging is in correlation with anklebrachial index.

EFIC5-0547

Clinical pain states: Neuropathic pain

NEUROPATHIC PAIN IN SPINAL CORD INJURY

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BACKGROUND AND AIMS: The neuropathic pain is frequent in patients with sequelae of SCI, often underestimated. The aims of our study are to present the characteristics of neuropathic pain and to evaluate the management of this pain.

METHOD: In this retrospective study in Department of PRM at the National Institute of Orthopedics Kassab, all patients hospitalized for management of sequelae of SCI in 2014 were assessed by clinical examination, ASIA scale, the search of contractures, or "irritative thorns" such as neurogenic heterotopic ossifications, bedsores, urinary or fecal troubles or infection. The nociceptive pain was assessed by the visual analogical scale (VAS) and the neuropathic pain by the DN4 Questionnaire.

RESULTS: 61 patients (9 women and 52 men), mean age 35.6 years were included. The most common cause of injury was a traffic accident. The level of injury was dorsal in 61% of patients and complete in 53% of patients. Spasticity was present in 61% of patients. Trophic disorders were found in 81%, urinary disorders in all patients with indication for intermittent catheterization. Urinary tract infections were objectified in 46% of patients. Neuropathic pain was present in 69% of our patients. The pain was intense in 53% requiring recourse to drug treatment. The neuropathic pain was expressed in 68% as burns and as electric shock in 51% of patients. Nociceptive pain was found in 23% of patients.

CONCLUSIONS: Neuropathic pain in SCI doesn't seem to be related to the type of trauma, the level / nature of injury. Multidisciplinary treatment may improve the patients.

EFIC5-0616

Clinical pain states: Neuropathic pain

NEUROPATHIC PAIN COMPONENT IN PATIENTS OF DIFFERENT AGE WITH OSTEOARTHRITIS

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Osteoarthritis-induced pain is a result of nociceptor stimulation, associated with local tissue damage and inflammation. Recent data suggest the presence of neuropathic pain symptoms in patients with osteoarthritis.

The aim of this study was to estimate the structure of pain syndrome and reveal the presence of neuropathic pain component in patients suffering from the knee osteoarthritis.

Materials and Methods. We've examined 20 patients with knee osteoarthritis aged 45-89 years (average age $66,9 \pm 1,3$ years). Patients were divided into 3 groups according to age: A – 45-59 years (N=5), B – 60-74 (N=9), C – 75-89 (N=6). To assess the NP component, we used painDETECT, LANSS, DN4 questionnaires. To assess intensity of pain, visual analogue scale was used. For statistical analysis of results, ANOVA, correlation and regression analysis were applied.

Results. Regression analysis shows a correlation between the questionnaires: LANSS and painDETECT ($r=0.73$, $p=0.000001$), DN4 and painDETECT ($r=0.73$, $p=0.000001$). 65% of patients with knee osteoarthritis taking the painDETECT were unlikely to have the NP component, 25% might possibly, 10% - probably had it. LANSS scale: 25% probably had NP. DN4 scale: 40% probably had NP. We found a tendency to an elevating neuropathic pain component, according to all the screening scales. Pain in a group of elderly patients of 75-89 years was found to be intensifying; however, these data were not significant.

Conclusions. Thus, in patients with osteoarthritis the pain syndrome may reveal NP features. Identification of these would promote a targeted treatment strategy.

EFIC5-0652

Clinical pain states: Neuropathic pain

LOST BUT NOT FORGOTTEN - RECURRENCE OF NEUROPATHIC PAIN BY PERIPHERAL TRAUMA

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BACKGROUND

Recurrence of symptoms by re-traumatisation is a well known phenomenon for CRPS (Complex Regional Pain Syndrome). This presentation discusses a case of neuropathic pain, recurring after trauma, which initially had been treated successfully by transdermal application of capsaicine 8% ("Qutenza" patches), which is acting on C-fibre-located Vanilloid-1 (TRPV-1)-channels.

CASE REPORT

A 84yrs old male patient presented to our outpatient department with chronic (>15yrs) neuropathic pain (verified clinically + by electroneurography) on his left lateral lower leg (neuropathic lesion of n. peroneus), which had started after lumbar and cervical spine surgery (insertion of intervertebral discs). Allodynia, dysaesthesia, and neuropathic pain (burning, max. NRS 8) were successfully treated by a series of 4 applications of topical capsaicin 8% ("Qutenza" transdermal patches) at 3-months-intervals, with simultaneous significant improvement of his chronic back pain. All analgesic medications (buprenorphine, pregabalin) were successfully discontinued.

Eight months later, the patient developed a lasting recurrence of the neuropathic pain immediately after an operation for hallux rigidus under local anaesthesia (LA) when LA had weaned and wound pain emerged; this pain did not respond to systemic analgesics.

Another series of "Qutenza"-applications was resumed (and is ongoing at the time this abstract is submitted).

(pictures (photos) : area treated by "Qutenza")

Summary

This case presents the recurrence of neuropathic pain after peripheral trauma (operation + postoperative wound pain) to the same extremity.

CONCLUSION

Prevention of postoperative pain by continuous regional block or nerve block should be strongly considered in patients with or at risk for neuropathic pain.

REFERENCES

EFIC5-0658

Clinical pain states: Neuropathic pain

TRIGEMINAL NEURALGIA TREATED WITH TOPICAL CAPSAICIN - CASE REPORT

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Introduction:

Trigeminal neuralgia (TN) is characterized by repetitive lancinating pain along one or more branches of the trigeminal nerve. 8% capsaicin patch(8%CP) is indicated for peripheral neuropathic pain(PNP) treatment in adults. It provides pain relief and avoids systemic uses problems. However, its efficiency in TN is yet to be demonstrated.

Case Report:

MEAS, 67-year-old-woman with hypertension and obesity visited chronic pain consultation because of an intense paroxistic left hemifacial pain for 3 months - Numerical Rating Scale (NRS)=8/10, Douleur Neuropathique 4 questionnaire (DN4)=6. This pain was accompanied by paresthesia, aggravated by cold and relieved by heat. After diagnosis of TN (V1+V2+V3 territories) she was treated with opioids, antidepressants and anticonvulsants. In the 3rd visit (4 months later) she had uncontrolled pain despite treatment optimization. Treatment with 8%CP was proposed and the patient accepted. Patches were applied in the left malar region (25cm²) for 30-60 minutes in day hospital regime under medical supervision, every 3 months with no record of any complications. At the 4th treatment, patient reported complete pain remission (NRS=0, DN4=0, Patients' Global Impression of Change=7 "a great deal better"). She maintained follow-up consultations for more than a year with no analgesic requirement.

Discussion and conclusions:

Although the use of 8%CP for TN treatment lacks formal statement, given the case exuberance, the pain control difficulty and the good experience on using 8%CP for PNP treatment in our centre, we decided to test it in this case. The results seem to be encouraging but feasibility and safety studies must be provided.

EFIC5-0666

Clinical pain states: Neuropathic pain

POSTHERPETIC NEURALGIA TREATED WITH TOPICAL CAPSAICIN - 2 CASE REPORTS

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Introduction:

Postherpetic neuropathy (PHN) presents a challenge for pain physicians and is often detrimental to the patient's quality of life. Many patients remain in pain or suffer side effects from the (combination) therapies. The 8% capsaicin patch (8%CP) is a treatment option.

Case Report 1:

MLRB, 81-year-old-women with PHN in the dependent region of the 11th left intercostal dermatome visited chronic pain consultation because of an intense pain for 11 months - *Douleur Neuropathique* 4 questionnaire (DN4)=7, Numerical Rating Scale (NRS)=8/10. In the 3rd visit, 4 months later, given the pain's difficult management with opioid and gabapentinoid it was proposed treatment with 8%CP in day hospital system which the patient accepted. After just one treatment she reported complete remission of pain (DN4=0, NRS=0, Patients' Global Impression of Change (PGIC)= 7 "great deal better"). She doesn't use pain medication for 2,5 years.

Case Report 2:

MMF, 64-year-old-man, visited chronic pain consultation because of PHN (DN4=6, NRS=10/10) in the dependent region of the 9th intercostal dermatome for 4 months. Treatment with gabapentinoid and 8%CP in day hospital system was proposed. After 2 treatments with a 3 months interval, the patient reported complete remission of pain (NRS=0, DN4=0, PGIC=7 "a great deal better"). He doesn't use pain medication for 3 years.

Discussion and conclusions:

The 8%CP seems to be effective and safe for the treatment of PHN, providing rapid and sustained pain reductions and a significant reduction in concomitant medications. It can be a valuable addition to the neuropathic pain treatment for certain patients.

EFIC5-0686

Clinical pain states: Neuropathic pain

NEUROPATHIC PAIN SYMPTOM INVENTORY IN DISCRIMINATION OF NEUROPATHIC AND NOCICEPTIVE PAIN

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Background: Neuropathic pain is a frequent manifestation of many disorders of peripheral and central nervous system. Simple questionnaires mainly based on the presence of so called „neuropathic pain descriptors“ represent the most important screening tool in the diagnosis of this condition (especially for non-specialists). Among other functions, these questionnaires may allow to discriminate neuropathic and nociceptive pain. The objective of this study was confirm diagnostic validity of one of the most frequently used questionnaires (Neuropathic Pain Symptom Inventory, NPSI) originally developed to characterize subtypes of neuropathic pain, in the discrimination of neuropathic and nociceptive pain.

Methods: Two groups of patients were examined with the Czech version of NPSI (NPSI_{CZ}): a group of patients with neuropathic pain (of peripheral or central origin in polyneuropathy or multiple sclerosis) (n=96, 32 men, median age 56) and a group of individuals suffering from nociceptive pain (due to severe gonarthrosis or coxarthrosis) (n=70, 25 men, median age 66). ROC analysis was performed to assess diagnostic validity of NPSI_{CZ} test and the optimal cut-off values.

Results: The NPSI score, partial subscores and most individual test item values shown statistically significant differences between patients with neuropathic and nociceptive pain. ROC analysis confirmed very good diagnostic validity of this questionnaire in the discrimination between neuropathic and nociceptive pain (AUC 0.935, sensitivity 0.87, specificity 0.84)

Conclusion: NPSI_{CZ} proved high diagnostic validity in the discrimination between neuropathic and nociceptive pain and can be recommended as an easy and suitable test for this purpose.

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EFIC5-0844

Clinical pain states: Neuropathic pain

THE EFFICIENT THREE MAKE THE PATIENTS PAIN FREE: TRAMADOL, PREGABALIN AND SYMPATHETIC BLOCK FOR PAIN MANAGEMENT IN PERIPHERAL ARTERY DISEASE

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Background and aim: Peripheral artery diseases (PAD) usually induces severe nociceptive pain due to hypoxic and concomitantly infected tissues and tormenting neuropathic pain due to axonal degeneration secondary to ischemia. Opioids, adjuvants and sympathetic blocks have been separately favoured for the condition. Here, we report efficient pain management in three patients with PAD with combined use of tramadol, pregabalin and sympathetic block along with hyperbaric oxygen therapy.

Case1: 38-yrs, male with, burning, throbbing-like pain at his right 1st and 2nd toe for 3 months. Verbal analogue score for pain (VAS) was 8.

Case2: 45-yrs, male with burning, throbbing-like pain at his left big toe for 8 months. VAS was 7.

Case3: 58-yrs, female with burning, stabbing-like pain at plantar site of her right foot for twelve months. VAS was 8.

All patients had severe pain and persistent infection although occlusions at distal vascular structures were successfully treated and hyperbaric oxygen and extensive antibiotic therapies were initiated.

Management plan: Initially anticoagulant and antiplatelet drugs were quitted and tramadol 100mg(2x1), pregabalin 75mg(1x1) po were started. After one week, there was 50% decrease in VAS, lumbar sympathetic block with bupivacaine 0.25% and dexamethasone 16mg was performed and pregabalin dose was doubled. At the third week, the purulent discharge discontinued and 80% of infected sites were improved while VAS were 2, 3, 2 in patients, respectively.

Conclusion: We suggest that patients with PAD can be managed effectively by a combination therapy of opioids, adjuvants and sympathetic block for pain relief and infection healing.

EFIC5-0939

Clinical pain states: Neuropathic pain

ANTINOCICEPTIVE EFFECTS OF RESINIFERATOXIN ON NEUROPATHIC PAIN MODEL IN MICE: ROLE OF TRPV1

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Background and aims: Resiniferatoxin (RTX) is the most potent amongst all known endogenous and synthetic agonists by transient receptor potential vanilloid 1 (TRPV1) receptor activation and has a selectivity for antinociception. However, the mechanism underlying the therapeutic effect of RTX in neuropathic pain is still unclear.

Methods: Male Swiss mice (7 weeks old, weight 30 - 40 g) were operated by chronic constriction injury model (CCI), or sham CCI. Each study group (n = 6) received RTX 2 µg in 20 µL of saline or only 20 µL of normal saline by intrathecal injection performed at the L4-L5 level. We evaluated the response to mechanical stimuli at 1, 3, 5, 7, 12, and 24 hours after injection and L4-L6 dorsal root ganglion was used for Western Blotting analysis of TRPV1 expression.

Results: RTX intrathecal treatment enhances the mechanical threshold at 1 hour and maintained for 24 hours in CCI operated mice. No changes were found in sham operated mice. TRPV1 overexpression found in all times in CCI operated mice was reduced by RTX treatment.

Conclusions: Our study provides new information about the mechanisms of the therapeutic actions of RTX in the treatment of neuropathic pain.

EFIC5-0556

Pain treatment (conservative): Topical analgesics

MANAGEMENT OF NEUROPATHIC PAIN AFTER SURGICAL TRAUMA USING 5% LIDOCAINE MEDICATED PLASTER

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BACKGROUND AND AIMS

The study focuses on neuropathic pain located at the post surgery scar tissue. This post-operative neuropathic cutaneous pain may be a side-effect of any incision of the skin in the context of a surgical procedure. Patients with scar tissue pain typically complain of continuous pain, alternating with spontaneous attacks of stabbing pain in the scar area. The aim is to evaluate the use of 5% lidocaine medicated plaster (LMP) for treating painful scars resulting from surgical trauma.

METHODS

A single-centre, open, non-randomised, prospective study was performed in our university hospital from June 2014 to December 2014. 40 patients were enrolled: 8 post abdominal hysterectomy, 10 post open inguinal hernia repair, 12 post C-section, 10 post xifopubic section for vascular surgery. The study included pain evaluation using the numeric rating scale (NRS) and measurement of the painful surface area. Patients with history of allergic reactions to local anesthetics, infection of the surgical site and with severe psychiatric disease were excluded.

RESULTS

Numeric rating scale (NRS) scorings were performed pretreatment (T 0), on the 28th day (T1), and after 60 days (T2). The mean of pretreatment NRS score (T0) was 7.8 +/- 0.69. The number of patients with a NRS score <5 at the second follow-up [NRS mean (T1) 5,2± 0,7] was 21 (52.5%). The main NRS score at the latest follow-up was 2,7±0,7.

CONCLUSIONS

Lidocaine 5% medicated plaster seem to be an effective treatment of post-surgical scar tissue pain.

EFIC5-0591

Pain treatment (conservative): Topical analgesics

EFFICACY AND SAFETY OF NICOBAXIL/NONIVAMIDE (FINALGON) OINTMENT FOR THE TREATMENT OF ACUTE PAIN IN THE LOW BACK - A RANDOMISED, CONTROLLED TRIAL

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Background: Until now, nonivamide/nicoboxil ointment has not been tested in a randomised trial for the treatment of acute non-specific low back pain.

Methods: This phase III randomised, double-blind, active- and placebo-controlled, multi-centre trial investigated efficacy, safety and tolerability of topical nicoboxil 2.5%/nonivamide 0.4% (Finalgon® ointment, Boehringer Ingelheim) for treatment of acute non-specific low back pain (primary endpoint: pain intensity (PI) difference between pre-dose baseline and 8 hours after the first application).

Results: Patients (n=805), 18 to 74 years of age were treated for up to 4 days with nicoboxil 2.5%/nonivamide 0.4%, nicoboxil 2.5%, nonivamide 0.4%, or placebo ointment.

Pre-dose baseline pain intensity (6.6 on a 0-10 point numerical rating scale) was reduced by 1.049 points with placebo, by 1.428 points with nicoboxil, by 2.252 points with nonivamide and by 2.410 points with nicoboxil/nonivamide after 8 hours ($p < 0.0001$ for nicoboxil/nonivamide vs. placebo, nicoboxil; $p = 0.4171$ for nicoboxil/nonivamide vs. nonivamide).

At the end of treatment, the combination provided more pronounced PI reduction (3.540 points) compared to nicoboxil (2.371, $p < 0.0001$), nonivamide (3.074, $p = 0.0259$) and placebo (1.884, $p < 0.0001$). Low back mobility scores on Day 1 were significantly better for the combination compared to all other treatments ($p < 0.044$); on Day 2 to 4, scores were better than for placebo and nicoboxil ($p < 0.003$).

Patients assessed efficacy of the combination as greater than of the comparators ($p \leq 0.0129$).

All treatments were tolerated well.

Conclusion: Nicoboxil/nonivamide ointment is an effective, well-tolerated medication for the treatment of acute non-specific low back pain.

ClinicalTrials.gov Identifier: NCT01708915

Sponsor: Boehringer Ingelheim

EFIC5-0692

Pain treatment (conservative): Topical analgesics

THE USE OF 8% CAPSAICIN IN THE TREATMENT OF PERIPHERAL NEUROPATHIC PAIN- 5 CASES STUDY

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Background and aim: postherpetic neuralgia (PHN) and persistent postoperative pain (PPP) are common causes of peripheral neuropathic pain. One of the recommended methods of therapy is local application of a 8% capsaicin patch. The aim of the study was to assess the efficacy and safety of 8% capsaicin patch (Qutenza, Astellas, Netherlands)

Materials and methods: the retrospective study was conducted among 5 patients (1 woman, 4 men) aged 60-92, treated in the Pain Clinic for: PHN (3 patients), PPP (1patient), pain after spinal cord injury (1 patient). Before the 8% capsaicin patch application, pharmacological management, local application of 5% lidocaine and regional blockades were performed. The intensity of paroxysmal and constant pain in NRS, adverse effects, the dosages of analgesics, the intensity and area of allodynia were assessed.

Results: 1-6 applications of were performed. The initial intensity of paroxysmal and constant pain was 6-10 and 0-4 in NRS respectively. After patch application a decrease in the intensity of paroxysmal pain (3-6 in NRS) and a lack of influence on the constant pain (0-4 in NRS) were noted. The allodynia area minimizing, a reduction in the use of analgesics and a longer period of time between the applications were observed. During the time of application the patients reported a local burning pain with no influence on the cardio-respiratory parameters.

Conclusion: The application of the 8% capsaicin patch in patients suffering from peripheral neuropathic pain resulted in a reduction of paroxysmal pain, minimized the allodynia area, and allowed to optimize the dosage of coanalgesics.

EFIC5-0695

Pain treatment (conservative): Topical analgesics

PATIENTS' EXPERIENCE AFTER REPEATED TREATMENTS WITH CAPSAICIN 8% PATCH FOR PERIPHERAL NEUROPATHIC PAIN

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Background:

The 8% capsaicin patch (Qutenza™) is licensed to treat peripheral neuropathic pain in non-diabetic adults. Capsaicin binds the cutaneous TRPV1 receptors. After initial excitation producing pain and erythema, prolonged nociceptor desensitisation follows.

Methods:

We audited patient experience after multiple applications of Capsaicin. 55 patients have been included in this audit and 44 patients responded after two treatments (>50% relief) and continued having treatments for >2 years. 44 pain diaries were analysed. Pain scores, global impression of change, Brief Pain Inventory (BPI), degree of allodynia and size of pain area measured at 4 weeks, 8 weeks, 12 weeks and then prior to each treatment.

Complications and changes in medications were identified via telephone follow-ups. Changes in allodynia, size of the affected area or medications changes were documented on subsequent follow ups.

Results:

Graphs and results will be presented on the EFIC poster.

Conclusions:

This audit showed that the Capsaicin 8% patch is an effective treatment option for patients' suffering painful peripheral neuropathy in an NHS pain clinic. Our results suggest that >50% of patients showed a worthwhile reduction in pain. We also observed reduction in the measured areas of pain, allodynia, improvement of PGIC and EQ5D. All responders reported an improvement in sleep and some also had a reduction of their pain medications.

Notably all patients diagnosed with peripheral nerve injury following surgical and scar pain were responders, reporting 80-90% percent pain relief at 12 weeks.

EFIC5-0729

Pain treatment (conservative): Topical analgesics

HIGH-CONCENTRATED CAPSAICIN 8% PATCH IMPROVES ALLODYNIA IN PATIENTS WITH CRPS

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Background: Treatment-refractory neuropathic pain in patients with CRPS severely impairs quality of life and presents a complex therapeutic challenge. The capsaicin 8% patch has been approved as a topical treatment for peripheral neuropathic pain. Here we aimed to investigate the effectiveness and safety of high-concentrated capsaicin in patients with CRPS type 1 and 2.

Methods: Retrospective analysis of 25 patients (age 24- 83 years; 14 women) with CRPS type 1 (n=19) or type 2 (n=6) treated with capsaicin 8 % dermal patch at least once. The following variables were assessed: change of pain intensity (Numeric Pain Rating Scale), onset of response, response duration, concomitant medication, and side effects. Treatment response was defined as pain reduction $\geq 30\%$.

Results: Patients received the first capsaicin application at a median of 13 months (range 2 months-14 years) after initial CRPS pain onset. After capsaicin application, the average pain intensity in the total cohort was reduced by 44% (-2.2 points) at rest and by 28% (-2.1 points) during activity. Treatment response was observed in 60% of all patients. Pain relief in the responder group was associated with improved sleep and daily functioning and reduced concomitant medication. In 1/25 patients an intermittent increase in allodynia was noted. A reactivation of CRPS was not observed.

Conclusions: Capsaicin 8% patch presents an effective and safe treatment option to treat allodynia in CRPS type 1 and 2. These results encourage prospective cohort studies investigating the efficacy of Capsaicin patch in CRPS allodynia

EFIC5-0730

Pain treatment (conservative): Topical analgesics

THE USE OF LIDOCAINE PATCH 5% IN PERSISTENT POST SURGICAL PAIN – A CASE REPORT STUDY

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Background and aims

Persistent post surgical pain (PPSP) is a known health care problem with substantial impact in patients' lives. Despite the large number of studies, there is a need for new and better treatment solutions.

We belong to a hospital with a surgical activity of 8003 patients in 2014, and in this study we report our experience with lidocaine patch 5% in PPSP.

Methods

We used the database from Leiria's Public Hospital Pain Unit to analyze the patients who started lidocaine patch for PPSP, and documented its efficacy and tolerability. We evaluated the Visual Analogic Scale scores in three categories (at the moment of the evaluation / the medium score of the week before / the worst score since last evaluation) in two different consultations. In the analysis, descriptive and inferential statistics were carried out, using nonparametric tests.

Results

In our analysis, we found statistic significance in the reduction verified at the medium pain score of the week before the first and the last evaluation ($5,6 \pm 2,0$ to $5 \pm 2,8$; $Z = -2,028$; $p = 0,043$). The same significance were achieved in the last category, reporting to the worst pain score since last evaluation ($7,8 \pm 1,9$ to $6,5 \pm 2,8$; $Z = 2,512$; $p = 0,012$). The procedures involved were varied, being the most prevalent the hernia repair. Most of the patients had concomitant analgesic therapeutic.

Conclusions

Our case report study supports the use of lidocaine patch to PPSP. More studies are needed to evaluate if its effectiveness is applied to other types of neuropathic localized pain.

ANALGESIC EFFECTIVENESS OF REPEATED APPLICATIONS OF CAPSAICIN 8% PATCH (QUTENZATM) IN A BROAD RANGE OF PERIPHERAL NEUROPATHIC PAIN

AETIOLOGIES

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Background and aims

The primary aim of STRIDE was to assess the long-term safety of repeated applications of the capsaicin 8% patch in a broad range of peripheral neuropathic pain (pNP) conditions

Methods

This Phase IV, multicentre, open-label, single-arm, 52-week, observational study enrolled 306 patients (mean $\pm$ SD daily pain intensity: 6.6 ± 1.4) and pNP conditions included postherpetic neuralgia (n=107), post-traumatic nerve injury (n=99), HIV-associated neuropathy (n=80) and other pNP (n=20). Capsaicin 8% patches (1–4) were applied for 60 min (30 min for the feet) at up to six treatment visits, with 9–12 weeks intervals. Results for the secondary endpoints average daily pain intensity and patient global impression of change (PGIC) are presented.

Results

Change in mean $\pm$ SD daily pain intensity in the total sample of patients who received 1–6 applications was -1.9 ± 1.98 [range: -0.5 to 3.1] from baseline to Month 12; 31.6% reported themselves as very much or much improved at the end of the study. In patients who received four consecutive capsaicin applications (n=100), change in mean $\pm$ SD daily pain intensity was -2.1 ± 1.7 [range: -1.0 to -3.2] and 48.1% reported themselves as very much or much improved.

Conclusions

Repeated applications of capsaicin 8% patch over 52 weeks in various pNP conditions is associated with a substantial reduction of pain and improved global impression of change over time, with consistent changes in the total sample and following four consecutive applications.

ANALGESIC RESPONSE TO LIDOCAINE 5% MEDICATED PLASTER IN PATIENTS WITH PAINFUL DIABETIC POLYNEUROPATHY UNDERLYING DIFFERENT SENSORY PATTERNS

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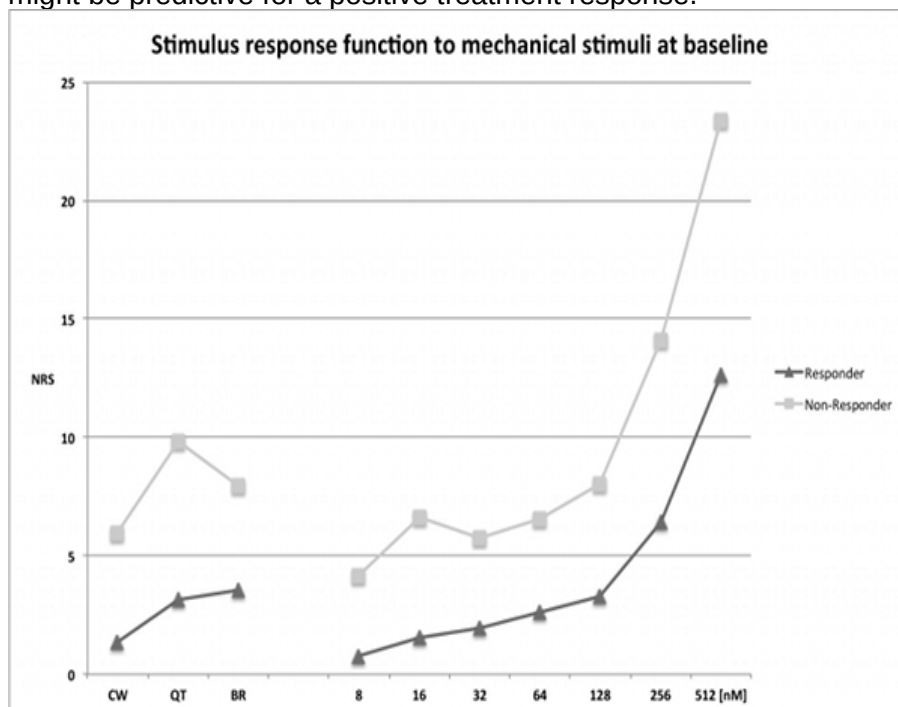
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Background and Aims: Pain is a common symptom in patients suffering from diabetic polyneuropathy. The purpose of this pilot study was the assessment of the treatment potential of topically applied lidocaine plasters in diabetic patients with well characterized neuropathic pain (mechanical and thermal quantitative sensory testing).

Methods: 61 patients (average pain NRS > 4 due to diabetic polyneuropathy at the lower extremities > 3 months) were treated with 1 - 4 lidocaine 5% plasters (Versatis, Grünenthal, Germany) for 12 hours a day. During the study period of 12 weeks patients reappeared at the two study centers 7 times for reporting of the pain intensity using NRS (0-10), repeated QST measurements, SF-36 health survey and McGill pain questionnaire assessment.

Results: After 12 weeks pain reduction > 50% was seen in 26/61 (43%), non-responders 35/61 (57%). Mean baseline NRS score 6.5 (SD 1.92) responders, 5.97 (SD 1.50) non-responder. Mechanically evoked pain ratings both dynamic and rigid were higher in non-responders than responders. Responders improved in all SF-36 parameters.

Conclusions: The high response rate in pain reduction and the improvement in quality of life as measured by SF-36 could make the lidocaine 5% plaster a good treatment option in painful diabetic polyneuropathy. The presence of relatively low mechanical hyperalgesia and allodynia might be predictive for a positive treatment response.



ANKLE EVERSION TAPING USING KINESIOLOGY TAPE TO TREAT LATERAL ANKLE PAIN

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ABSTRACT

Background and aim: Individuals with lateral ankle sprains have lateral ankle pain and various functional deficits in activities of daily and while playing sports. The aim of this study was to evaluate the effects of ankle eversion taping (AET) using kinesiology tape to treat lateral ankle pain.

Methods: Thirty men with lateral ankle sprains and Cumberland Ankle Instability Tool (CAIT) scores ≤ 27 were randomly divided into 2 groups, and either (1) real AET with 30–40% stretch of its original length ($n = 15$) or (2) placebo AET ($n = 15$) was applied daily for 2 weeks (Fig. 1). Each participant completed the 9-item CAIT questionnaire based on a 30-point scale. The Star Excursion Balance Test (SEBT) (Fig. 2) and weight-bearing ankle dorsiflexion (Fig. 3) were assessed.

Results: The real AET significantly increased the CAIT scores ($p < 0.05$), the weight-bearing ankle dorsiflexion ($p < 0.05$), and the reach distances in 3 directions in the SEBT ($p < 0.05$), whereas the placebo AET did not significantly increase any of these parameters ($p > 0.05$).

Conclusion: Our results indicate that AET to avoid painful inversion may be an effective method for reducing pain and enhancing ankle function in patients with lateral ankle pain.

Fig. 1. Ankle eversion taping (AET) using kinesiology tape: (A) real AET and (B) placebo AET

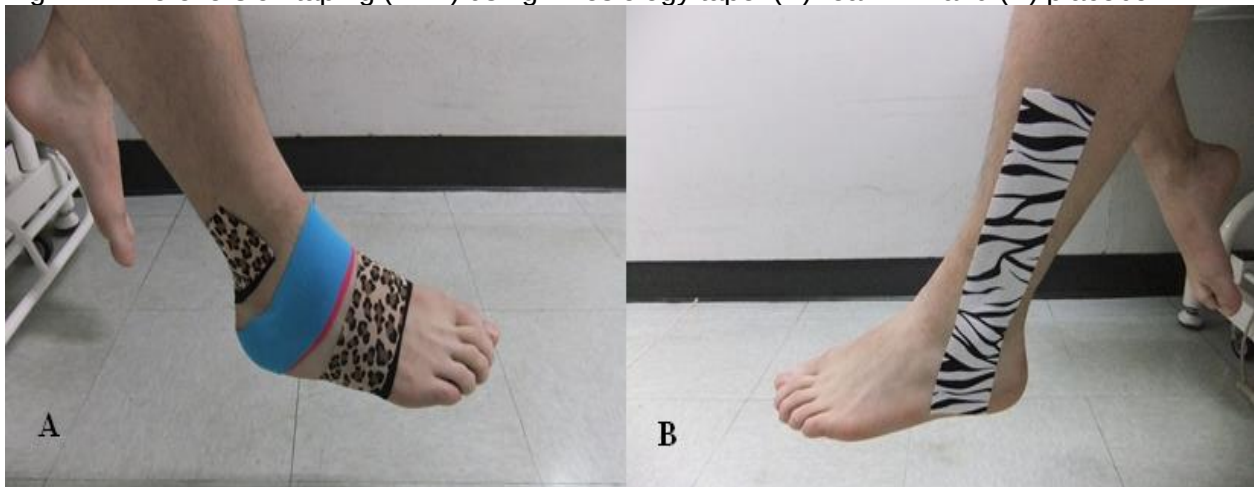


Fig. 2. The Star Excursion Balance Test: (A) anterior, (B) posterolateral, and (C) posteromedial directions

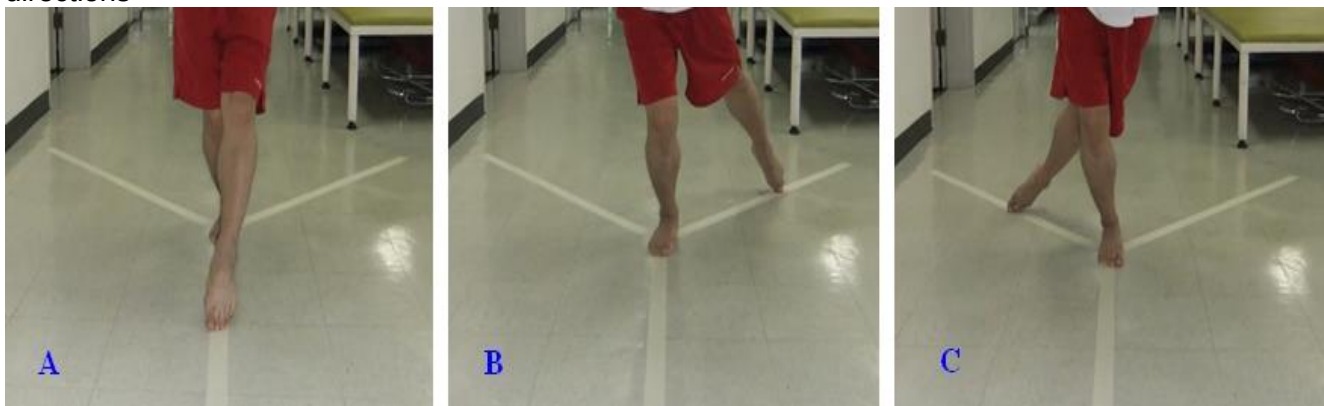


Fig. 3. The weight-bearing ankle dorsiflexion



THE ROLE OF BEHAVIORAL AND SOCIAL FACTORS IN THE RELATIONSHIP BETWEEN PAIN CATASTROPHIZING AND PAIN INTENSITY: A MODERATED MEDIATION MODEL

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Background. The literature suggests an association between pain catastrophizing and pain intensity. The current study hypothesized that pain behaviors can mediate this association. Moreover, expressing pain behaviors can elicit caregivers' responses. Therefore, the association between pain behaviors and pain intensity may depend on caregivers' responses. Furthermore, we explored the effect of caregivers' responses on patients' pain intensity based on both patients' perception of caregivers' responses and caregivers' reports. **Methods.** The sample consisted of 154 chronic pain patients and their family caregivers. Patients completed questionnaires about pain catastrophizing, pain intensity, pain behaviors and their perception about caregivers' responses. Caregivers completed a questionnaire about responding to patients' pain. To investigate the hypotheses, a simple mediation and several moderated mediation analyses were conducted. **Findings.** Pain catastrophizing was associated with pain intensity ($r = .36$). Pain behaviors mediated this association ($p = .02$). Other findings indicated that the association between pain behaviors and pain intensity was only significant if patients reported high levels of caregivers' solicitous (CI [.20, .78]) and high levels of caregivers' distracting responses (CI [.29, .89]) and if caregivers' reported high levels of solicitous responses (CI [.22, .88]). **Discussion.** Results indicated that the relationship between pain catastrophizing and pain intensity was mediated by pain behaviors. Moreover, caregivers' responses to patients' pain behaviors had influence on the link between pain behaviors and the report of pain intensity. Meaning that patients who show more pain behaviors perceive more intensive pain when caregivers only if caregivers show supportive responses.

TOP-DOWN CONTROL OVER PAIN IN FIBROMYALGIA PATIENTS: AN EXPERIMENTAL STUDY

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Background and aims: Pain largely interferes with ongoing tasks in daily life. Although task interference by pain is largely automatic, it can be controlled to a certain extent (so called top-down-control). The aim of this study is to compare the level of top-down control over pain between Fibromyalgia patients (FP) and a healthy comparison group (HC).

Methods: 49 FP (41 females; $M_{age}=45.2$; $SD=9.4$) and 49 matched HC (40 females, $M_{age}=45.4$; $SD=12.1$) performed a newly developed within-subject design to assess task interference by pain and distraction effectiveness. In particular, participants performed (1) a visual localization task in the presence of irrelevant non-painful vibrating or painful electric somatic stimuli, or (2) a somatosensory localization task (using non-painful or painful stimuli) in the presence of irrelevant visual stimuli.

Results: Pain intensity ($F_{(1,94)}=30.7$, $p<.001$) and unpleasantness ($F_{(1,94)}=30.4$, $p<.001$) were reduced when people performed the visual localization task (i.e., distraction task) compared with when people performed the somatosensory localization task. Furthermore, results showed that the presence of pain stimuli decreased task performance ($F_{(2,93)}=38.0$, $p<.001$) compared with non-painful stimuli in both groups. No difference was found between FP and HC in terms of distraction effectiveness (intensity: $F_{(1,94)}=0.4$, ns; Unpleasantness: $F_{(1,94)}=0.1$, ns) and magnitude of task interference by pain ($F_{(2,93)}=1.37$, ns).

Conclusions: On group level, FP show no reduced top-down control over experimentally induced pain compared with HC. Further research should focus on individual difference variables that may explain reduced top-down control over pain within a group of FP.

CHANGES IN PAIN CATASTROPHIZING PREDICT CHANGES IN PAIN INTENSITY AND PAIN INTERFERENCE IN PATIENTS WITH NEUROPATHIC PAIN: A CROSS-LAGGED PANEL ANALYSIS STUDY

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Background and aims: Catastrophizing is recognized as an important factor associated with negative outcomes in individuals with chronic pain. Longitudinal studies are needed to better understand the temporal relationship between these variables. The aim of this study was to examine the ability of early treatment-related changes in catastrophizing to predict later treatment-related changes in both pain intensity and pain interference (and vice versa).

Methods: 538 patients with neuropathic pain, documented by the *Douleur Neuropathique* 4 scale (DN4) from six multidisciplinary pain clinics across Canada from 2008-2011, completed (as part of a larger trial) validated measures of catastrophizing, pain intensity and pain interference at baseline, 3- and 6-months. Cross-lagged panel analyses were used to determine the temporal associations among these variables (Finkel, 2004).

Results: Unique cross-lagged relationships were found between early changes in catastrophizing and later changes in both pain intensity and pain interference ($p < .001$). The same pattern was found with early changes in both pain intensity and pain interference, prospectively accounting for unique variance in later changes in pain catastrophizing ($p < .001$).

Conclusions: This study demonstrated that changes in catastrophizing predict subsequent changes in both pain intensity and pain interference, consistent with the idea that catastrophizing plays a causal role in impacting these two outcome variables. These findings suggest a mechanism by which cognitive interventions designed to reduce catastrophizing contribute to improvements in both pain intensity and pain interference.

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DISTRACTION FROM PAIN IMPROVES POSTURAL STABILITY DURING EXPERIMENTAL PAIN

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BACKGROUND AND AIM: Attentional focus improves performance of motor skills such as balance. It is however unknown if such benefits can be achieved in painful conditions known to impair balance. The aim of this study was to investigate how shifts in attentional focus affect balance performance during experimental muscle pain.

METHODS: Thirteen volunteers received intramuscular injection of hypertonic saline (painful) in the right m. vastus medialis (isotonic saline was used as non-painful control). An 11 points numeric rating scale (NRS) was used to assess verbally the pain intensity (0 represented “no pain” and 10 “worst imaginable pain”). Subjects were asked to stand as still as possible with eyes closed on a force plate for 40 seconds during 2 different conditions for both injection types: (i) uncontrolled focus; (ii) attentional focus (subjects touched a curtain with their right index finger and were asked to keep the curtain as still as possible). The area of body sway was extracted.

RESULTS: Hypertonic injections induced higher average pain NRS scores compared with control injection ($P < 0.05$). Experimental pain during the uncontrolled focus condition increased the body sway area compared with all other conditions ($P < 0.05$). During the attentional focus task, both the pain and control condition induced similar body sway area ($P > 0.05$).

CONCLUSION: Shifting the attentional focus from pain during quiet standing reduced the pain effects on the motor system observed by improvements in balance performance. Similar approach might be relevant in clinical practice, helping pain patients to perform rehabilitation exercises with better quality.

EFIC5-0644

Human behavioural science: Cognitive processes

CROSS-MODAL INTERACTIONS BETWEEN PAIN AND VISION: ENHANCED RESPONSES TO VISUAL STIMULI APPLIED IN AN AREA OF SECONDARY HYPERALGESIA

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Background and aims: High frequency stimulation (HFS) applied onto the skin enhances the perception of pain of mechanical nociceptive stimuli delivered to the skin surrounding the conditioned area. After HFS, event related potentials (ERPs) elicited by nociceptive and non-nociceptive somatosensory stimuli are also enhanced. Here we tested if HFS was able to enhance visual evoked potentials (VEPs) applied onto the conditioned arm. **Methods:** High-density EEG (64 channels) was recorded in 18 participants before and after (T1, 20 minutes; T2 45 minutes) HFS. Visual stimuli were generated by two green laser diodes and were projected onto the skin where HFS was applied. The amplitude of the vertex complex (N2 and P2) of VEPs elicited by stimuli applied onto the HFS arm was compared across time to VEPs elicited by stimuli applied onto the control arm. **Results.** All participants developed hyperalgesia for mechanical punctate stimuli applied onto the HFS arm. Hyperalgesia was present at 20 and 45 minutes. In addition, we observed that the N2 elicited by stimuli applied to the HFS arm were enhanced at 20 minutes. In contrast, the N2 elicited by stimuli applied to the control arm was decreased. The amplitude of the P2 was decreased at 20 minutes for both arms. **Conclusion.** In line with previous reports, HFS induced a long lasting hyperalgesia. VEPs were instead enhanced only at 20 minutes, selectively for the arm onto which HFS was applied. This is the first report showing enhanced responses to visual stimuli applied in an area showing hyperalgesia.

NOW YOU FEEL IT, NOW YOU DON'T: PAIN-RELATED MOVEMENTS ENHANCE SOMATOSENSORY PERCEPTION

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Background and aims: During movement, perception of somatosensory information on the moving body part is typically inhibited (i.e., sensory suppression) to allow adequate performance. We examined whether sensory suppression is attenuated when a movement is anticipated to induce pain. This is particularly relevant given the high prevalence of pain-related problems in physical activity and movement. We hypothesized that pain anticipation on the moving body part would enhance attention to that body location and thereby would reduce sensory suppression.

Methods: Undergraduate students (N=40) were instructed to move both arms either to the left or to the right, or keep them at rest, while simultaneously detecting a possible tactile stimulus on the left or right forearm. We manipulated pain anticipation by means of differential conditioning of the movements: One movement was occasionally followed by a painful stimulus on only the left or the right arm (threat). The other movement was never followed by pain (safe). **Results:** A movement type (threat vs. safe) x target location (threatened vs. neutral arm) repeated measures ANOVA on the calculated sensory suppression indexes was conducted. We found that during the threat movement, there was indeed less sensory suppression on the pain than on the neutral location. No such effect was found during the safe movement. **Conclusions:** The results suggest that pain anticipation during movement may result in enhanced processing of somatosensory input at the moving body part. The possible role of malfunctioning sensory suppression in pain-related movement impairment is discussed.

EFIC5-0705

Human behavioural science: Cognitive processes

REASONING AND DECISION MAKING ARE IMPAIRED BY PAIN

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Introduction: Pain disrupts our attention to prioritise avoidance of harm and promote analgesic behaviour. Given that successful reasoning and decision making depend on effortful attention, and that pain disrupts this attention, we sought to investigate whether pain reduces rational reasoning and decision making in two studies.

Study 1 Method: Participants (N = 40) completed the Cognitive Reflection Test (CRT) and Belief Bias Syllogisms (BBS) task, which each pit automatic processing against effortful attention-demanding processing. Thermal pain was induced at the participant's threshold between-participants (CRT) or within-participants (syllogisms).

Study 1 Results: Self-rated pain intensity was negatively correlated with the number of intuitive responses to the CRT: more intense pain reduced participants' effortful attention on the task. For the BBS task, participants with self-rated high intensity pain gave fewer logical answers to belief-inconsistent items than participants with low intensity pain.

Study 2 Method: Participants (N = 928) reported their pain status and completed the Decision Outcomes Inventory (DOI) online. The DOI measures negative life events that may stem from bad decision making.

Study 2 Results: Participants with chronic pain reported significantly more negative outcomes in the domain of financial decision making than those with acute pain or no pain.

Conclusions: Rational reasoning and decision-making rely on effortful, attention-demanding cognitive processes, and our results suggest that pain reduces participants' ability to engage such processes. This could lead to worse life outcomes for individuals with pain.

Acknowledgements:

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Human behavioural science: Cognitive processes

THE DISRUPTIVE EFFECTS OF PAIN ON N-BACK TASK PERFORMANCE IN A LARGE GENERAL POPULATION SAMPLE

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Introduction: Pain captures attention, displaces current concerns, and prioritizes escape and repair. Studies on induced pain, naturally occurring acute pain and chronic pain all demonstrate a detrimental effect on specific tasks of attention, especially those that involve working memory. However, studies to date have relied on relatively small samples, and/or one type of pain, thus restricting our ability to generalize to wider populations.

Methods: We investigated the effect of pain on an n-back task in a large heterogeneous sample of 1194 adults recruited and tested via the internet. Participants reported whether or not they were in pain and the type and intensity of any pain they were experiencing. Participants then completed a 2-back task to assess working memory updating.

Results: Despite the heterogeneity of pain conditions, participant characteristics and testing environments, we found a stable performance decrement on the n-back task for those with pain, compared to those without: participants responded significantly more slowly and there were significantly more false alarms on non-target trials. Furthermore we also found an effect of pain intensity: performance was poorer in participants with higher intensity compared with lower intensity pain.

Conclusions: We suggest that the effects of pain on attention found in the laboratory also occur in more naturalistic settings. Pain is common in the general population and such interruption may have important, as yet uninvestigated, consequences for tasks of everyday cognition that involve working memory.

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INTERRELATEDNESS BETWEEN DIFFERENT INHIBITORY FUNCTIONS; ONE COMMON PAIN INHIBITORY CONSTRUCT?

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Background and aims: Multiple inhibition-related measures have been identified that relate to experimental pain sensitivity and/or predict the risk of future pain, such as cognitive inhibition, conditioned pain modulation, and the placebo-like effect. Little is known about whether these factors represent independent constructs, or whether they load on one common factor that predicts pain susceptibility. The goal of this study was to address this issue. Methods: Fifty students from the Radboud University Nijmegen complete tests measuring interference control, prepotence response inhibition, conditioned pain modulation, and the effect of placebo- and nocebo-suggestions. Primary outcome measure was experimental pain sensitivity as assessed with the cold pressor test (CPT), using both the immersion time and the subjective numerical pain score at the time of withdrawal.

Results: Simple correlation analysis revealed only small-to-moderate correlations between the CPT outcome measures and the ability to inhibit prepotence responses, but not the other inhibition tests. The nocebo-effect revealed a moderate correlation with interference control; no correlations were found between any of the other pain inhibitory measurements. These results were confirmed in subsequent path analyses.

Conclusions: This study is the first to examine the interrelatedness between diverse pain inhibitory functions. Only small-to-moderate correlations between a selected number of these measures were found. This indicates that they primarily represent independent constructs, that potentially independently relate to predicting e.g., the risk of developing future postoperative pain.

Acknowledgements: This research was supported by the IASP Early Career Research Grant funded by Scan| Design Foundation BY INGER & JENS BRUUN.

EFIC5-0854

Human behavioural science: Cognitive processes

CORTICAL NETWORK INVOLVED IN IMPLICIT PERCEPTION OF PAIN FACIAL EXPRESSIONS. A DEPTH ELECTRODE ERP STUDY IN HUMAN

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Pain facial expressions are complex stimuli encoding both the affective and the sensory dimensions of pain. They have communicative value and should be detected rapidly, possibly subliminally, to protect the self and avoid a possible dangerous situation. To understand which cortical regions are early involved in pain facial recognition, we recorded event-related potentials (ERPs) in 9 epileptic patients with intracerebral electrodes during observation of painful facial expressions and neutral faces. Our task was an implicit recognition task requiring attention to gender and ERPs were analyzed in the 1000 ms after the face presentation. We compared electrophysiological responses to painful facial expressions and neutral faces in cortical regions known to be involved in sensorial and emotional pain aspects as well as executive regions. Our results showed that ERPs to pain or neutral faces were similar in terms of latency and amplitude in the fusiform areas (BA 19, 37 and 20, involved in faces recognition), the posterior insula and the inferior orbitofrontal area (BA 47). On the contrary, we observed ERPs with higher amplitudes for painful faces in the anterior insula at 164 ms after the pictures onset, and later, in the frontomedial lobe (BA 9) between 299 ms and 633 ms. This suggest that, at a very early stage of face processing, cortical regions involved in sensory aspects of pain are not involved in the decoding of pain expression as compared to neutral faces. Implicit pain expressions might be rather governed by pain emotional regions and higher executive functions areas.

EFIC5-0990

Human behavioural science: Cognitive processes

CORTICAL MARKERS OF PAIN MEMORISATION – A STUDY WITH INTRA-CEREBRAL RECORDINGS IN HUMANS

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Short-term memorization of nociceptive events seems to involve cortical regions implicated in the sensory and cognitive dimensions of pain. However, the timing of these activations and how these regions interact are not known.

This study proposes to highlight cortical regions involved in a short-term memory painful task, and their interactions by using intra-cerebral recordings from 10 epileptic patients. In order to emphasize pain memory specificity, three different stimulations were used: painful, somatosensory non-painful and auditory. Two different intensities were delivered in each condition, and patients had to compare stimulation from the previous one, delivered 8 to 10 seconds before. In a control task, patients had to read numbers on a screen between two stimuli, in order to ensure that they did not memorize anything about the stimulation. Data were analysed in terms of evoked potentials and time frequency during retention phase.

When painful stimuli had to be memorized, early components of evoked potentials showed an increased amplitude as compared to the control task, in regions involved in affective aspects of pain (anterior insula, prefrontal cortex). Moreover a specific late negativity was observed only for painful stimuli memorisation, which suggests an enhanced arousal.

Time-frequency analysis showed an alpha desynchronisation in memory tasks during retention phase in regions involved in cognitive and affective dimensions of pain (anterior insula, anterior cingulate cortex, prefrontal cortex) which might be related to cognitive processing and mechanisms of attention

SINGLE-TRIAL VARIABILITY OF SIMULTANEOUS SPINAL AND SUPRASPINAL RESPONSES DURING COGNITIVE TASKS ASSESSED USING MUTUAL INFORMATION ANALYSIS

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Background and aims: Repeated physiological measures are variable, but the source of such variability is notoriously difficult to pin down. Here we aimed to quantify the trial-by-trial variabilities of two biological responses elicited by one intense somatosensory stimulus: the spinal nociceptive withdrawal reflex (NWR) and the brain somatosensory-evoked potential (SEP).

Methods: We electrically stimulated the foot sole to elicit both the NWR, measured by EMG on the *tibialis anterior* muscles, and the SEP, measured by scalp EEG at the vertex. In different stimulation blocks subjects were asked to either focus on the stimuli ('attention' condition) or perform a visual Stroop test ('distraction' condition). The condition effect on both single-trial SEPs and NWR was analyzed using linear mixed model (LMM), for each waveform timepoint. The across-trial variability of SEPs and NWR in each condition was quantified using Mutual Information (MI). Differences in MI between the two conditions were assessed by repeated measures ANOVA.

Results: the NWR had smaller amplitude during attention compared to distraction (LMM, p

Conclusions: NWR are larger and less variable during distraction.

EFIC5-0281

Pain treatment (conservative): Preemptive analgesia

GABAPENTIN INDUCE CHANGES OF PLASMA CORTISOL LEVEL AND IMMUNE STATUS IN HYSTERECTOMIZED WOMEN

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AIM

We investigated effects of gabapentin (GBP) on stress-related changes of cortisol and catecholamines in patients who underwent hysterectomy. We followed the influence of GBP on the immune status in the stress response to surgery.

METHODS

Sixty patients were randomly assigned to the GBP administration 1h before surgery (n= 30 pts), or to the placebo group (n=30 pts). Blood samples were collected before, 30 min and 24h after the surgery. The intensity of pain was assessed by a visual analogue scale (VAS) every 8h at rest. Immunomodulatory effects of GBP were determined by flow cytometry. We followed the total proportion of CD3⁺ lymphocytes, CD3⁺CD4⁺, CD3⁺CD8⁺, CD19⁺ B lymphocytes, CD16⁺CD56⁺CD3⁻NK cells and CD16⁺CD56⁺CD3⁺ NKT cells before and 24h after hysterectomy. The plasma cortisol and catecholamines concentration was used to estimate the level of the stress response.

RESULTS

VAS pain score at rest was significantly lower in the GBP group (P= 0.003). Application of GBP decreased significantly the plasma cortisol level 24h after the operation (P < 0,001). We found significant positive correlation between the VAS pain score and concentration of cortisol in all patients (P=0.025). GBP reduced the concentration of catecholamines (p<0,05). The proportion of CD3⁺ (P=0.027) and CD3⁺CD4⁺cells (P=0.006) was significantly lower in the GBP group 24h after operation, while the contribution of CD19⁺ (P=0.033) was significantly higher.

CONCLUSION

Preoperative administration of GBP reduced the pain scores at rest at 0, 16 and 24h . GBP reduced the stress response and changed immune parameters in the reaction to surgery.

COMPARISON OF GABAPENTIN AND PREGABALIN FOR PRE-EMPTIVE ANALGESIA IN POST ENDODONTIC PAIN

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Background & Aims: Pain needs to be avoided as far as possible in relation to endodontic treatment. Recent trend is to “pre-empt” the pain with the use of pharmacotherapy to improve the patient experience. This study aimed to evaluate and compare the analgesic efficacy of Gabapentin or Pregabalin vs a placebo in post endodontic pain.

Materials & Methods: In this prospective, randomized and placebo controlled double blind study, each patient received either 600 mg Gabapentin (Group: A; N=30) or 75 mg Pregabalin (Group: B; N=30) or a Placebo (Group: C; N=30) 24 hrs and 30 minutes prior to the endodontic treatment. Pain scores were evaluated at 02 hrs(T1), 04 hrs (T2), 06 hrs (T3), 12 hrs (T4), 24 hrs (T5), 48 hrs (T6) and 72 hrs (T7) using the Verbal Rating Score (VRS).

Results: The VRS values were greatest at T2 time point. VRS values at all the time points were lowest in Group A and the difference was significant($P<0.05$) at T2, T3, T4 and T5 time points. VRS values for Group B were lower than those of the placebo group but the difference was significant only at T2, T3 and T4 time points.

Conclusion: Thus we concluded that pre-emptive administration of Gabapentin significantly reduces post procedure pain in endodontic patients as compared to pregabalin or placebo. It may, potentially be used as a routine agent for pre-empting the pain.

EFIC5-0028

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

**STIMULATION OF THE MOTOR CORTEX FOR CHRONIC NEUROPATHIC PAIN:
ANATOMO- CLINICAL CORRELATIONS**

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Introduction:

The aim of this study was to search the relationship between the anatomical location and the eventual analgesic effect.

Materials and Methods:

22 patients suffering from central and / or peripheral neuropathic pain were implanted with extradural stimulation of the precentral cortex.

Implantation electrodes was performed using intraoperative: **1)** Anatomical identification by Neuronavigation with 3D MRI, **2)** Somesthetic evoked potentials monitoring, **3)** Electrical stimulations to identify the motor responses.

In order to locate postoperatively the electrodes, a 3D-CT was performed and fused with the preoperative MRI. The clinical analgesic effects of cortical stimulation were collected on a regular basis (VAS reduction > 50%, drugs consumption).

Results:

Post implantation analgesic effects were obtained in 18 patients out of 22. The analgesic effect was companied with reduction of the drugs consumption in 15 patients. The post-operative 3 D CT analysis shows a correspondence between the effective contacts localization and the motor cerebral cortex somatotopy in the patients with post-operative good analgesic effects.

No correspondence was found between the contacts localization and the motor cerebral cortex somatotopy in the 4 patients with no analgesic effects. In three out of these four patients, analgesic effects were obtained after a new surgery allowing a replacement of the electrode position over the motor cortex somatotopy corresponding to the painful area.

Conclusion: This study shows the correlation between position of the contact (cathode) over the precentral cortex and the analgesia obtained when the somatotopy of the stimulated cortex correspond to the painful area.

STUDY OF THE USE OF SPINAL CORD STIMULATION (SCS) AT THE UNIVERSITY HOSPITAL OF SALAMANCA IN THE PERIOD 2012-2013.

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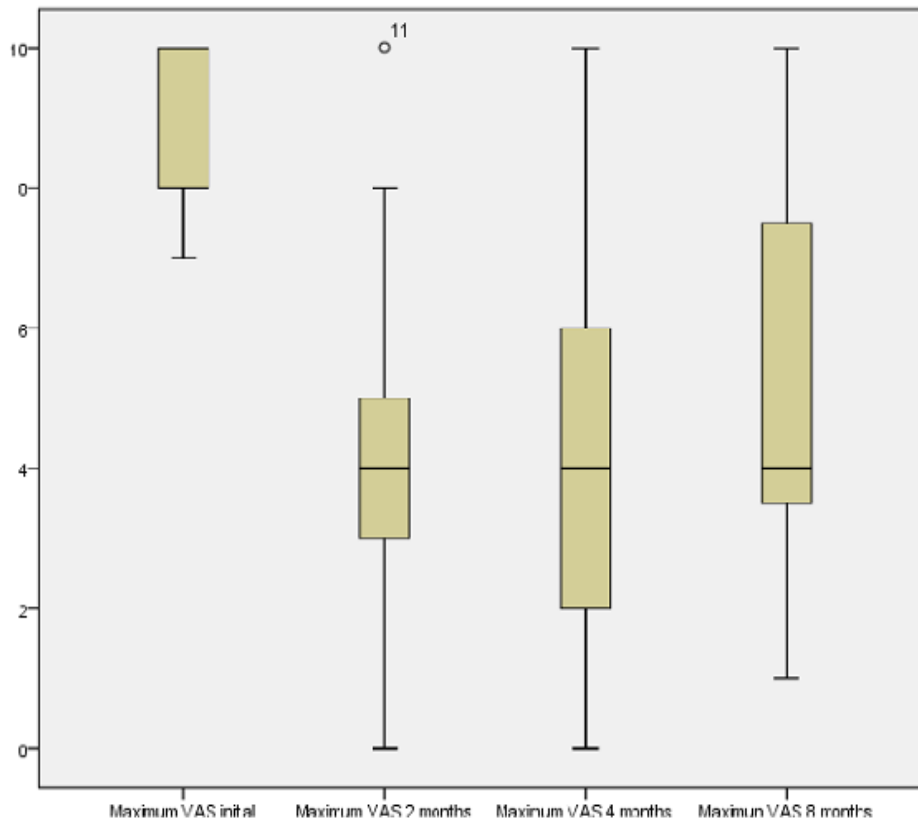
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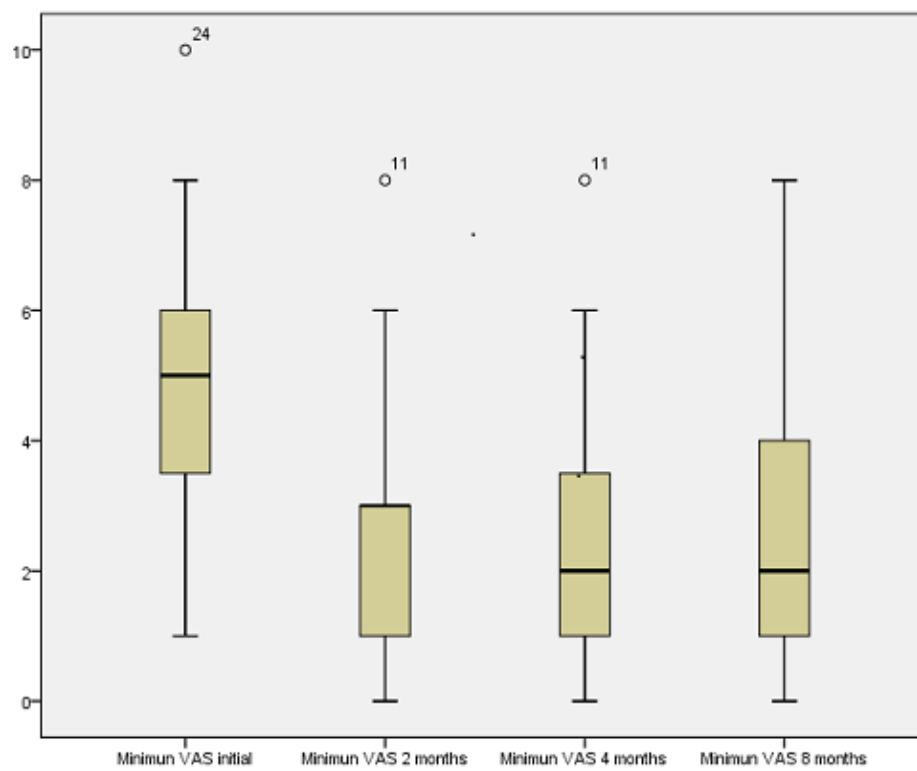
Background and aims: The spinal cord stimulator has proven to be an effective treatment in states of chronic, intractable pain, becoming a mainstay in neuromodulation. This technique is widely accepted, which adds low morbidity and its cost-effectiveness.

Methods: Retrospective, transversal and descriptive study in which the medical records of all patients that they had implemented a system of spinal cord stimulator in the period between January 2012 and December 2013 were reviewed at University Hospital of Salamanca. It was registered the technical indication, the type of device implanted, the pain intensity by visual analog scale (VAS) and needs of drug treatment previously and after the implementation of the system, the technical complications and the use of the device in percentage.

Results: 37 patients were included in this period of time. The main indications were failed back syndrome (37.8%) and complex regional pain syndrome (35.1%). A reduction was observed in the intensity values of maximum and minimum pain at 2, 4 and 8 months in comparison with baseline values with statistically significant results ($p < 0.05$) as well as maintenance or reduction needs drug treatment at 8 months after the implant. Complications occurred in 64.9% of patients, the most frequent is the migration of the electrode tip.

Conclusions: The implementation of a system of spinal cord stimulator in the Pain Unit of the University Hospital of Salamanca technique is demonstrated effective in reducing pain intensity, with a complication rate and adherence to consistent indications literature current scientific.





MULTICOLUMN SPINAL CORD STIMULATION FOR SIGNIFICANT LOW BACK PAIN IN FAILED BACK SURGERY SYNDROME: A NATIONAL, MULTICENTRE, RANDOMIZED, CONTROLLED HEALTH ECONOMICS STUDY (ESTIMET)

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Introduction: Many studies have demonstrated the efficacy of spinal cord stimulation (SCS) for chronic neuropathic radicular pain over recent decades. But despite global favourable outcomes in Failed Back Surgery Syndrome (FBSS) with leg pain, the back pain component remains poorly controlled by neurostimulation. The efficacy of multicolumn SCS lead configurations for the treatment of the back pain component of FBSS has recently been suggested by pilot studies. However, a randomized controlled trial must be conducted to confirm the efficacy of new generation multicolumn SCS. ESTIMET is a multicentre, randomized study designed to compare the clinical efficacy and health economics aspects of mono vs multicolumn SCS lead programming in FBSS patients with radicular pain and significant back pain.

Materials/Methods: FBSS patients with a radicular pain VAS score ≥ 50 mm, associated with a significant back pain component were recruited in 14 centers in France and implanted with multicolumn SCS. Before the lead implantation procedure, they were 1:1 randomized to monocolumn SCS/(group 1) or multicolumn SCS/(group 2). Programming was performed using only one column for group 1 and full use of the 3 columns for group 2. Outcome assessment was performed at baseline (pre-implantation), 1, 3, 6 and 12 months post-implantation. The primary outcome measure was a reduction of the severity of low back pain (bVAS reduction $\geq 50\%$) at the 6-month visit.

Result/Conclusion: Trial recruitment started in May 2012 and closed in October 2013. The last visit last subject was performed in January 2015. Results are expected to be analyze for June 2015

EFIC5-0382

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

COMPLICATIONS OF NEUROMODULATION THERAPY IN PATIENTS WITH CHRONIC PAIN. CANADIAN EXPERIENCE

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Background and aims

The neuromodulation therapy in chronic pain as spinal cord stimulation (SCS) and intrathecal pump therapy (IPT) are widely used. The objective of this study was to give an overview of important complications and to evaluate strategies to reduce the risk to the patient.

Methods

This is a descriptive retrospective study of 108 patients who attended a tertiary center Pain Clinic from 2009 to 2014. 51 with SCS and 57 with IPT. We reviewed the literature to compare our rates of complications and to identify ways to prevent them.

Results

Only two major complications occurred in the group of SCS that represented 3.92% of complications. One patient had two episodes of erosion and infection at the battery site. The second patient had a dysfunction of his SCS that did not cover the entire pain region. The group of IPT presented 12 major complications which represented 21,05% of patients. 7 patients had problems with the drug delivery system; 2 patients had infections, 2 had pain at pump site, and 1 patient had end-of-life pump which went unnoticed.

Conclusions

This study reviews the complications encountered with SCS and IPT. Their analysis allows recommendations to avoid complications. Among those, optimal choice of surgical implantation site and technical strategies to avoid problems are discussed in details. Early recognition of signs of infection is mandatory. Identification of material dysfunctions by medical staff and continued medical education program are recommended.

MODELING NERVE AND MUSCLE FIBER ACTIVATION DURING PERIPHERAL NERVE FIELD STIMULATION.

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Background and aims

Peripheral nerve field stimulation (PNFS) is a potential treatment for chronic low-back pain that works by activating non-nociceptive A β -fibers. However, PNFS may also activate muscles, causing twitches and discomfort for some patients.

In this study, we developed a mathematical model, to investigate the activation of sensory and motor nerves, as well as direct muscle fiber activation.

Methods

The extracellular field was estimated using a finite element model based on the geometry of CT scanned lumbar vertebrae. The electrode was modeled as being implanted to a depth of 10-15 mm. Three implant directions were modeled; horizontally, vertically and diagonally. Both single electrode and 'crosstalk' stimulation were modeled. The estimate of the extracellular field was combined with models of sensory A β -nerves, motor neurons and muscle fibers, and the activation thresholds of these nerves and fibers were determined.

Results

The model showed that sensory A β fibers could be activated with thresholds down to 0.563 V, and the lowest threshold for motor nerve activation was 7.19 V using 'crosstalk' stimulation with the cathode located closest to the nerves. All thresholds for direct muscle activation were above 500 V.

Conclusions

The results suggest that direct muscle activation does not occur during PNFS, and concomitant muscle and sensory fiber activation are only likely to occur when using the crosstalk configuration. Thus, it may be relevant to investigate the location of the innervation zone of the low-back muscles prior to electrode implantation to avoid muscle activation.

EFIC5-0416

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

OCCIPITAL NERVE STIMULATION IN THE TREATMENT OF CHRONIC HEADACHES – OUR EXPERIENCE

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Background and aims: Chronic headaches, especially migraine are disabling conditions in which conservative treatment often fails. Occipital nerve stimulation (ONS) introduced in 1999 is a possible effective treatment for some types of refractory headaches.

Methods: Since 2012 we have performed ONS in 6 patients (4 female, 2 male) suffering from migraine (3 patients) and occipital neuralgia (3 patients). Electrode was implanted bilaterally in 2 cases and unilaterally in 4 cases. In all of these patients conservative treatment failed and patients fulfilled required preconditions for effective and safe ONS including successful effect of the preoperative transcutaneous electrical nerve stimulation (TENS). Patient's diary and clinical examination were used for evaluation of pain relief and quality of life.

Results: We have reached good results with minimally 50% decrease of pain intensity and frequency, significant reduction of drug intake and improvement of a quality of life (e.g. manifested by return to job) in all patients. There were no uncomfortable adverse events of implantation and stimulation.

Conclusions: ONS has been safe and efficacious for treatment of medical refractory migraine and occipital neuralgia in our small group of patients. We described significant relationship between TENS and ONS successful results.

This work was supported by Grant MHCZ - DRO (Nemocnice Na Homolce - NNH, 00023884)

STIMULATION OF THE SUBTHALAMIC NUCLEUS IMPROVES PAIN IN PARKINSON'S DISEASE

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Background and aims: Deep brain stimulation of the subthalamic nucleus (STN-DBS) is an effective treatment option for Parkinson's disease (PD). Besides the characteristic motor symptoms, somatosensory abnormalities are also frequently described by the patients, but have only recently started to come into focus. Nevertheless these symptoms need to be treated in order to improve quality of life. Our aim was to investigate whether STN-DBS also influences somatosensory signs and symptoms in PD. Methods: 12 PD patients (mean age 56.2 ± 11.0 years, 5 females, 7 males, mean disease duration 8.6 ± 2.7 years) were investigated with the Quantitative Sensory Testing (QST) protocol of the German Research Network on Neuropathic Pain. Patients were additionally asked for presence and intensity of pain and to complete the PainDetect questionnaire to detect nociceptive and neuropathic components of pain. Examination was performed prior and 6 months after bilateral STN-DBS.

Results: 8 (66.6 %) patients reported pain, of these 7 (58.3 %) had nociceptive pain. Compared to controls, PD patients showed a stronger loss for cold and mechanical detection and increased heat pain sensitivity. UPDRS (21.4 ± 11.6 to 15.6 ± 12.8 , $p < 0.05$) and mean pain intensity (4.3 ± 2.0 to 1.7 ± 2.2 , $p < 0.05$) decreased after STN-DBS, whereas thermal and mechanical pain and detection thresholds did not differ prior/after STN-DBS.

Conclusions: Nociceptive pain is frequent in PD and improves by STN-DBS, whereas thermal or mechanical detection or pain thresholds are not modified.

Results: 8 (66.6 %) patients reported pain, of these 7 (58.3 %) had nociceptive pain. Compared to controls, PD patients showed a stronger loss for cold and mechanical detection and increased heat pain sensitivity. UPDRS (21.4 ± 11.6 to 15.6 ± 12.8 , $p < 0.05$) and mean pain intensity (4.3 ± 2.0 to 1.7 ± 2.2 , $p < 0.05$) decreased after STN-DBS, whereas thermal and mechanical pain and detection thresholds did not differ prior/after STN-DBS.

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EFIC5-0471

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

NEUROPATHIC PAIN PATIENTS WHO FAILED PRIOR NEUROMODULATION THERAPIES RESCUED WITH DORSAL ROOT GANGLION (DRG) STIMULATION: A SINGLE CENTRE EXPERIENCE

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Background and aims: With several neuromodulation therapies available at the disposal of a pain physician, there is no consensus on which one of them is the optimal intervention for neuropathic pain of a given etiology. We present a case series of sixteen patients that failed at least one neuromodulation therapy treated with dorsal root ganglion (DRG) stimulation.

Methods: Patients who were previously refractory to neuromodulation (including spinal cord stimulation [SCS], high-frequency SCS [HF-10], and transcutaneous electrical nerve stimulation [TENS], were identified at our centre. Using epidural techniques, specially designed leads were deployed near the target DRGs. Following a successful trial ($\geq 50\%$ pain relief), patients were permanently implanted. Pain (visual analogue scale [VAS] and quality of life (EQ-5D index score) at baseline, 1 and 3 months post implant were compiled retrospectively.

Results: Fifteen patients had a successful trial (94% trial rate). Majority of the patients (n=10) had failed TENS, while six had failed SCS and /or HF-10. Pain and EQ-5D index scores improved from 75.7 ± 14.4 mm (n=14) and 0.231 ± 0.294 (n=13) at baseline to 43.7 ± 21.9 (n=11) and 0.467 ± 0.319 (n=11) at 3 months post implant. Two patients were explanted (infection, dural puncture), while another was explanted due to lead fracture.

Conclusions: Preliminary results indicate that DRG stimulation provides modest yet clinically significant improvements in pain and quality of life in patients refractory to other neuromodulation therapies. However, long term follow up is required to determine the stability of the outcomes.

EFIC5-0472

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

EFFECTIVENESS OF SPHENOPALATINE GANGLION (SPG) STIMULATION FOR CLUSTER HEADACHE: 2 YEAR LONG-TERM FOLLOW-UP RESULTS FROM THE PATHWAY CH-1 STUDY

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BACKGROUND AND AIMS

In the randomized, double-blind, multi-center study of an inserted sphenopalatine ganglion (SPG) neurostimulator (Pathway CH-1), 68% of patients experienced clinically significant improvements with SPG stimulation within the 4 month study period. We aimed to evaluate long-term response to SPG stimulation for chronic cluster headache (CCH).

METHODS

43 patients with medically refractory CCH (minimum 4 attacks/week) were enrolled in the Pathway CH-1 study; 33 continued into a long-term follow-up study and completed at least 2 years of follow-up. Each treated attack was evaluated for effective therapy (pain relief from moderate or greater pain, or pain freedom from mild pain). Acute responders achieved effective therapy in ≥50% of evaluable treatments. Frequency responders experienced a ≥50% reduction in attack frequency compared to baseline.

RESULTS

A total 5956 attacks were treated among all 33 patients (19% mild initial pain, 45% moderate, 23% severe, 13% very severe). 65% (N=3849/5956) of these attacks achieved effective therapy (64% of mild attacks, 78% of moderate, 62% of severe, 23% of very severe).

61% (20/33) of patients experienced clinically significant improvements, with 5 patients classified as both acute and frequency responders, 10 classified as acute, and 5 classified as frequency responders. Acute responders successfully treated, on average, 75% of their cluster attacks. Frequency responders experienced, on average, an 82% reduction in attack frequency.

CONCLUSIONS

SPG stimulation continues to be effective for the treatment of medically refractory CCH in a majority of patients for two years following initial implant.

EFIC5-0647

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

HIGH-DENSITY SPINAL CORD STIMULATION FOR TREATMENT OF CHRONIC PAIN: A MULTI-CENTER EXPERIENCE.

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Background and aims: A number of studies have shown positive effects of spinal cord stimulation (SCS) with high frequencies on the treatment of chronic pain. The common aspect of these techniques is electrical stimulation at higher energy per second (high density or HD). We explored the effects of HD stimulation in patients receiving SCS and with good pain suppression.

Methods: Twenty-four patients (12 men, 12 female) with a rechargeable SCS system implanted for 4-45 months for chronic post-surgical pain and good pain relief consented for HD SCS. Programming to HD was done at a frequency of 300Hz in combination with the highest pulse width possible. The amplitude was set at a level below paresthesia threshold. The primary outcome was chronic pain rating with visual analog scale (VAS).

Results: The rating of pain was on average 4.7 (range 1-8) with traditional settings and 4.3 (8 - 0) with HD settings. Fourteen patients indicated better pain suppression with HD: VAS-traditional 4.9 (1-8) vs VAS-HD 3.4 (0-6). Other SCS variables are shown in Table 1.

Conclusion: HD SCS should be considered as a means to optimize patients receiving SCS for treatment of chronic pain conditions.

Table 1. Stimulation parameters for traditional and HD SCS.

	Traditional		HD	
	Average	Range	Average	Range
Frequency (Hz)	63	10 – 220	300	NA
Pulse Width (µsec)	296	60 – 450	724	390 - 780
Amplitude (volt)	2.8	0.35 – 10.5	1.5	0.2 – 7.5
Recharge cycle (once / .. days)	11	2 – 30	7	0.5 - 14

EFIC5-0667

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

HIGH DENSITY SPINAL CORD STIMULATION FOR TREATMENT OF CHRONIC BACK AND LEG PAIN: A CASE REPORT

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Background and aims: Spinal cord stimulation (SCS) for treatment of chronic pain uses electrical pulses to modulate the nervous system. An option to optimize patient reported outcome is by applying high density (HD) SCS, i.e. increasing the frequency and pulse width while lowering the amplitude. We report the outcome of HD stimulation in a patient with diminished pain suppression with SCS while using high stimulation amplitudes.

Methods: A female patient, age 53, with chronic back and bilateral leg pain (VAS 9 in the range 0-10) due to failed back surgery syndrome (FBSS), was implanted in 2011 with a 16-contact lead surgical lead and programmed with traditional SCS parameters (30 Hz, 450 μ s) which gave good paresthesia coverage and satisfactory pain suppression. Over time pain could not controlled well while stimulating at a high amplitude (9.5 volt), which resulted in a pain score of 7 in rest and 8 during activity, which was considered unsuccessful.

Results: SCS HD parameters were programmed (130 Hz, 450 μ s) in order to optimize pain suppression, which resulted in back and leg pain scores decreasing to 4 in rest and 7 during activity. This effect was achieved at an amplitude of 4.7 volt.

Conclusions: This case report shows that in case the efficacy of spinal cord stimulation diminishes, changing to high density parameters pain the suppression of back and leg pain can be recovered. Long term follow up needs to be performed to demonstrate the sustained effect of this technique.

EFIC5-0688

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

**CONVENTIONAL SPINAL STIMULATION AND NEW STIMULATION ALGORITHMS:
UPDATE ON MECHANISMS OF ACTION & EFFORTS TO INCREASE STIMULATION
EFFICACY**

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Background and Aims: Spinal cord stimulation (SCS) is an important adjunct in the treatment of neuropathic pain. The mechanisms of traditional SCS have been studied in animal experiments during the last three decades. In addition new stimulation paradigms have now been launched

SCS types with very high stimulation frequencies (HF SCS) (up to 10,000 Hz) and burst stimulation have been introduced but for these there are as yet no firm animal data on mechanisms.

Methods: Studies on neuropathic animals have been performed using different kinds of spinal electric stimulation. Own and other studies are surveyed.

Results: For neuropathic pain antidromic activation of segmental interneurons in the dorsal horns have been observed to be important especially GABAergic, cholinergic and adenosinergic cells - involving also some brain stem centers.

Own animal studies show neither block or activation of the dorsal columns by the HF SCS. For burst SCS data is slowly emerging. One critical factor for the effect may be the amount of electric charge that is transmitted from the electrode system to the neural tissue per time unit ("charge density"). Some preliminary data, animal and clinical, showing efficacy of different SCS algorithms will be reported.

Conclusions: The basic neurophysiology and neurochemistry for conventional SCS is partly mapped but the basic mechanisms for the new stimulation methods is at present almost completely unknown. The present state of knowledge is reviewed and outlines for further development of efficacy of neurostimulation are presented.

EFIC5-0736

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

SCIATIC NERVE INTRA-FASCICULAR LIDOCAINE INJECTION INDUCED PERIPHERAL NEUROPATHIC PAIN : ALLEVIATION BY SYSTEMIC MINOCYCLINE ADMINISTRATION

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Background and aims: Peripheral nerve block guidance with nerve stimulator or echo may not prevent from intrafascicular injury. This study investigate whether intrafascicular lidocaine induces peripheral neuropathic pain and if this pain can be alleviated by minocycline administration.

Methods: 168 Male Sprague-Dawley rats were included. In experimental one, 2% lidocaine (0.1 ml) was injected into the left sciatic nerve. Hind paw responses to thermal and mechanical stimuli, as well as sodium channel and activating transcription factor (ATF-3) expression in injured dorsal root ganglion (DRG) and activated glial cells in spinal dorsal horn (SDH) were measured on day 4, 7, 14, 21 and 28. According to the results of experimental one, rats in experimental two were divided into sham, extra-neural, intra-fascicular, peri-injury minocycline, and post-injury minocycline groups. The behavior responses, macrophage recruitment, expression changes of myelin basic protein (MBP) and Schwann cell in sciatic nerve, dysregulated expression of ATF-3 in DRG, and activated glial cells in L5 SDH were assessed on day 7 and 14.

Results: Intra-fascicular lidocaine induced painful behaviorurs, down-regulated Nav 1.8, and increased ATF-3 expression in DRG, and activated glial cell in SDH. Increased macrophages, Schwann cell proliferation, and increased intensities of MBP was found in damaged sciatic nerve. Minocycline attenuated intra-fascicular lidocaine induced nerve damage. Peri-injury minocycline reduced Schwann cell, MBP and ATF-3 expression, alleviated mechanical behaviors, mitigated macrophage recruitment into sciatic nerve, and suppressing activated microglial in spinal cord as compared with post-injury minocycline.

Conclusions: Peri-injury minocycline alleviated intra-fascicular lidocaine-induced peripheral neuropathic pain.

EFIC5-0776

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

EFFECTS OF CEREBELLAR DIRECT CURRENT STIMULATION ON PAIN PERCEPTION

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Background and aims: The cerebellum is involved in a wide number of integrative functions, but its role in pain experience and in the nociceptive information processing is poorly understood. Here, we evaluated the effects of transcranial cerebellar direct current stimulation (tcDCS) by studying the changes in the perceptive threshold, pain intensity at given stimulation intensities (VAS:0-10) and laser evoked potentials (LEPs) variables.

Methods: Fifteen healthy subjects were studied before and after anodal, cathodal and sham tcDCS. LEPs were obtained using a neodymium: yttrium–aluminium–perovskite (Nd:YAP) laser stimulation of the dorsum of the left hand. VAS was evaluated by delivering laser pulses at two different intensities, respectively two and three times the perceptive threshold.

Results: Cathodal polarization dampened significantly the perceptive threshold and increased the VAS score, while the anodal one had opposite effects. Cathodal tcDCS increased significantly the N1 and N2/P2 amplitudes and decreased their latencies, whereas anodal tcDCS elicited opposite effects. Motor thresholds assessed through transcranial magnetic stimulation were not affected by cerebellar stimulation.

Conclusions: tcDCS modulates pain perception and its cortical correlates. As it is effective on both N1 and N2/P2 components, we speculate that the cerebellum engagement in pain processing modulates the activity of both somatosensory and cingulate cortices, thus interfering with the sensory-discriminative, as well as with the emotional component of nociceptive perception. Present findings prompt investigation of the cerebellar direct current polarization as a possible novel and safe therapeutic tool in chronic pain patients.

IS MORE NECESSARILY BETTER? RESULTS FROM A CLINICAL STUDY LOOKING INTO THE CUMULATIVE ANALGESIC EFFECT OF TRANSCRANIAL DIRECT CURRENT STIMULATION

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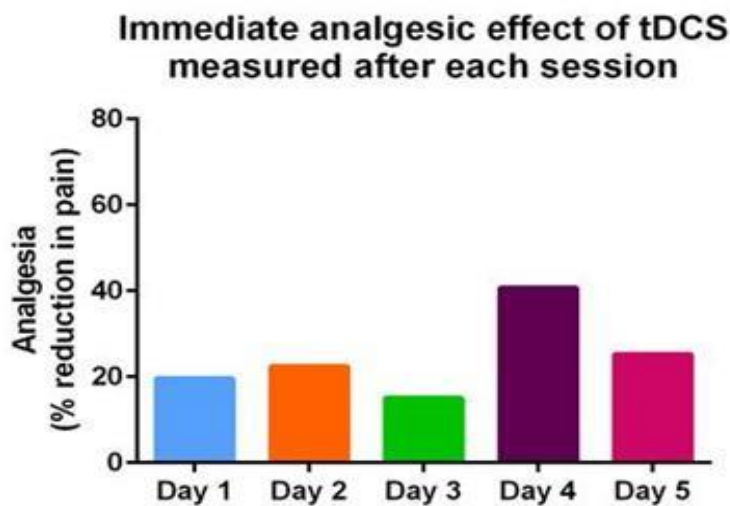
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Background and aims: Previous studies have shown that the analgesic effect of transcranial direct current stimulation (tDCS) increases when tDCS is administered on multiple consecutive days (cumulative effect). The objective of this study was to determine whether this cumulative effect, observed in neuropathic pain patients, could also be observed in elderly individuals suffering from chronic musculoskeletal pain.

Methods: Elderly individuals (n = 13, mean age = 72) suffering from chronic musculoskeletal pain were recruited to participate in this randomized, double-blind, sham-controlled study. Participants received either anodal tDCS of the contralateral motor cortex (2 mA, 20 minutes) or sham stimulation for five consecutive days. Pain intensity was measured before and after each tDCS session with a visual analogue scale (VAS). A pain logbook was also used to evaluate the average pain felt during each treatment day.

Results: Analysis of VAS ratings revealed that both real and sham tDCS reduced pain. However, for the pain logbooks, only real treatment led to an improvement in pain. Importantly, both the VAS and the pain logbook showed no cumulative analgesic effect.

Conclusions: These results suggest that motor cortex tDCS can be effective for reducing pain in elderly individuals suffering from chronic musculoskeletal pain but that giving several consecutive sessions does not increase the magnitude of analgesia. Future studies, with larger sample size, are necessary to confirm the present results and determine if other parameters (e.g., duration of analgesia) can be affected by the number of treatment sessions.



EFIC5-0883

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

HIGH DENSITY STIMULATION: A NOVEL PROGRAMMING OPTION

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Background: Spinal cord stimulation (SCS) uses electrical pulses to activate or modulate the nervous system, resulting in pain relief. Because of the many parameter-pairing options, there may be various ways to use amplitude, pulse width, frequency and electrodes to improve pain management and/or patient comfort. One option is by increasing the frequency and pulse width, i.e. transferring to high density (HD) SCS, while decreasing the amplitude. We tested HD stimulation in patients with diminished pain suppression with traditional SCS.

Methods: Two female patients, ages 69 and 56, with failed back surgery syndrome (FBSS), were initially programmed with traditional SCS parameters (2.0 – 5.7 volts, 40 – 100 Hz, 240 – 450 μ s). HD parameters were: frequency between 130 - 1200 Hz, pulse width between 120 – 450 μ s and amplitude between 2.15 – 3.5 volts.

Results: HD SCS was started after traditional SCS failed to adequately treat low back pain in both patients. Back pain scores decreased from 7-8 on a VAS prior to HD programming to 3-4 and 0-1 on a VAS after HD programming (Table 1).

Conclusions: The results demonstrate that by changing to HD SCS, pain suppression of back and leg pain can be optimized in cases where the efficacy of traditional SCS diminishes. HD SCS should be considered for optimizing the treatment of chronic back and leg pain in patients with FBSS. Further studies of HD SCS are needed to learn about the optimal parameter combinations and establish its place in the algorithm to optimize SCS outcomes.

EFIC5-0899

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

OBJECTIVE MEASUREMENTS OF LUMBAR SPINE FUNCTION IN BACK PAIN PATIENTS UNDERGOING HIGH-FREQUENCY SPINAL CORD STIMULATION AT 10 KHZ

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Introduction:

Patients with low back pain have limitations in functional capacity due impaired back function and kinesiophobia, resulting in worsened functional status, reduced ability to work and quality of life.

The Oswestry Disability Index (ODI) is the most commonly used questionnaire to assess the functional capacity of such patients (Fairbank, Spine 2000). However, it is limited by relying on patient recollection and feedback. Therefore, objective and easy to use validated methods for measuring patients function are required. We evaluated the SPINE device (Epionics Medical GmbH, Potsdam, Germany), which allows the objective assessment of the lumbar spine motion and function in chronic back patients candidate for high-frequency Spinal Cord Stimulation at 10 kHz (HF10 SCS).

Material and Methods

Epionics SPINE

The Epionics SPINE system is a CE-marked system (Fig. 1) which allows the objective evaluation of movement dynamics and function through the recording of a pre-determined standard choreography and yields information on movement range and dynamics in about 15 minutes (Fig. 2)

Conclusions:

The Epionics functional measurements are easy to perform in routine practice and provide objective, clinically relevant information on lumbar spine function in chronic back pain patients. In SCS patients, this device provides objective information demonstrating the significant impact of HF10 SCS in improving patients function. Further research is needed to confirm these results.

EFIC5-0911

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

RANDOMIZED CONTROLLED CLINICAL TRIAL EVALUATING 10 KHZ HIGH FREQUENCY AND TRADITIONAL LOW FREQUENCY STIMULATION FOR THE TREATMENT OF CHRONIC BACK AND LEG PAIN: 18-MONTH RESULTS

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Background and Aims. A randomized controlled trial with appropriate statistical power and long term outcomes is the hallmark of Level 1 clinical evidence. The SENZA-RCT multicenter pivotal study compared high frequency spinal cord stimulation (SCS) at 10 kHz (HF10™ therapy) and traditional low frequency (~50 Hz) SCS for the treatment of chronic back and leg pain.

Methods. 171 of randomized 198 patients responded during a trial phase of the assigned SCS system and were implanted. 18 month results were available for 165 patients. Responders had ≥50% pain reduction, while pain remitters had VAS pain score of ≤2.5 out of 10.

Results. At 18 months, back pain decreased to a greater degree with HF10 therapy (64.9%±30.8%) than traditional SCS (42.5%±35.9%), $p<0.001$. Similarly, leg pain decreased to a greater degree with HF10 therapy (65.4%±35.2%) than traditional SCS (45.0%±40.3%), $p<0.001$. More patients were pain responders to HF10 therapy than traditional SCS (Back pain: 75.9% vs 47.7%, $p<0.001$; Leg pain: 77.0% vs 53.8%, $p<0.001$). More patients were also pain remitters with HF10 therapy than traditional SCS (Back pain: 62.1% vs 30.8%, $p<0.001$; Leg pain: 64.4% vs 38.5%, $p<0.001$). Patients classified as remitters in both groups combined had a back pain score of 1.2 ± 0.8 and a leg pain score of 1.0 ± 0.8 .

Conclusions. The SENZA-RCT study provides strong Level 1 evidence in support of long-term use HF10 therapy as compared with traditional low-frequency SCS for the treatment of chronic back and leg pain. Remarkably, most HF10 therapy patients achieved pain remission.

INTRODUCING THE CONCEPT OF REMISSION FROM CHRONIC PAIN: APPLICATION IN SPINAL CORD STIMULATION CLINICAL TRIAL RESULTS AND ITS CORRELATION TO FUNCTIONAL OUTCOMES

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Background and Aims. "Remission" refers to the absence of clinically significant signs and symptoms of an incurable disease. Although remission is utilized in specialties such as psychiatry and oncology, it has not been applied to interventional pain management. We introduce the concept of remission from chronic pain and apply it to the SENZA-RCT data.

Methods. We defined remission as a sustained pain score of ≤ 2.5 out of 10.0. This was based on pain scores of ≥ 4.0 warranting pharmaceutical intervention and patients seek treatment when their pain level is > 2.5 . Furthermore, a score of ≤ 2.5 is believed to have minimal impact on the patient activities of daily living (ADLs) and quality of life (QOL). This definition was applied to the SENZA-RCT study, which compared paresthesia-independent 10 kHz spinal cord stimulation (HF10 therapy) and traditional paresthesia-based low-frequency (~ 50 Hz) SCS. Correlations to functional outcomes were explored.

Results. At 12 months, 68.5% of HF10 therapy patients achieved back pain remission and 67.4% achieved leg pain remission compared to 35.8% and 42.5% respectively for traditional SCS patients ($p < 0.001$ for both). Patients achieving remission averaged VAS scores of 1.2 ± 0.7 for back pain and 0.9 ± 0.8 for leg pain. Classification of subjects as remitters or non-remitters was highly correlated with Higher Oswestry Disability Index (ODI) ($p < 0.001$) and SF-12 measures ($p < 0.001$).

Conclusions. Remission is henceforth introduced to interventional pain management. We propose "remission in a majority of patients" as a benchmark for pain management therapies.

EFIC5-0944

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

HIGH DENSITY (HD) STIMULATION, AN EFFECTIVE PROGRAMMING OPTION?

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Background and Aims

Spinal cord stimulation (SCS) is an established treatment of chronic neuropathic pain. Sub-threshold stimulation at higher frequencies has been shown to produce paraesthesia free pain relief. High density (high energy/sec) seems to be a common characteristic of paraesthesia free SCS. A variety of programming options can provide HD stimulation. Conventional stimulation (40Hz; 400us; 1mA) delivers a charge/second of 16,000nC/s and pulse density of 1.6%. High density stimulation (200Hz; 1000us; 1mA) delivers a charge/second of 200,000nC/s and pulse density of 20%.

The aim of this study was to assess the effects of HD stimulation at sub-perception levels.

Methods

Six patients were given a trial of SCS. The trial was conducted in the usual manner with paraesthesia mapping on the table, using a bipole configuration, to determine optimal lead positioning. Once lead is positioned patients are reprogrammed with a pulse width of 1000us and rate of 200Hz. The voltage was programmed to 90% of the perception threshold.

Results

Data was collected pre-implant and at the conclusion of trial. The meanVAS recorded pre-trial, was 8.5 vs 2.1 post trial. This shows a reduction in mean pain score of 75%. The poster presentation will present long term follow data on pain, quality of life, patient satisfaction and programming changes, up to the most recent follow up.

Conclusions

In conclusion, these results, suggests that HD is an effective way to deliver paraesthesia free pain relief.

SPINAL CORD STIMULATION FOR INTRACTABLE THORACIC SEGMENTAL NEUROPATHIC PAIN: A CASE REPORT

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BACKGROUND

Spinal cord stimulation (SCS) has been described in a variety of neuropathic pain conditions. Failed back surgery syndrome and complex regional pain syndrome are the two main neuropathic pain syndromes with high probability of successful pain reduction.

METHODS

We report here the outcome of single lead SCS in the case of a 29-year-old woman with severe unilateral thoracic segmental neuropathic pain. She had been operated twice at the level of thoracic 9 vertebrae (laminectomy and excision of the benign tumour) for the treatment of osteoid osteoma. She had severe, unilateral, throbbing and burning pain at the left T8 and T9 dermatomes after the operation. No pain relief could be obtained despite medical therapy and invasive procedures including epidural blocks and radiofrequency techniques. A single octapolar lead was placed percutaneously at the thoracic level and 80% coverage of the painful area was obtained.

RESULTS:

After the trial period, pain relief 70%, decrease in analgesic use, improvement in functional status were obtained. Pain scores decreased from 7-8/10 to 2-3/10 on the numeric scale and remained stable more than nearly three months by now.

CONCLUSIONS:

SCS was effective for the treatment of severe, intractable thoracic segmental neuropathic pain that had occurred after the operation for thoracic osteoid osteoma.

EFIC5-1058

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

SPINAL CORD STIMULATOR AND IT'S EFFECTIVENESS IN COMPLEX REGIONAL PAIN SYNDROME

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Background and aims:

Complex regional pain syndrome (CRPS) is a complex condition characterised by disturbances of sensory, motor, and autonomic function that may be associated with trophic changes. Pain reduction and restoration of function form the mainstay of therapy within an interdisciplinary setting. To date, no scientifically validated cure exists. We present our SCS experience in 90 patients.

Methods

All CRPS patients confirmed by IASP defined criteria who underwent SCS between July 2010 - June 2014 at our neuromodulation centre were retrospectively studied. The patients underwent a 1- 2 weeks trial of the SCS with eight or/and four contact SCS electrodes. Following a successful trial the patients underwent the permanent implant of implantable pulse generator. Primary outcome measures for either pain intensity or pain relief included the visual analog scale (VAS), categorical scores for pain intensity or pain relief, and end-of-treatment global ratings of treatment efficacy (such as EQ-5D, PGIC). In addition, secondary outcome measures were recorded along with patient reported problems following the permanent implant.

Results:

Out of 90 patients, the data was analysed for success among percutaneous and tunnelled trials, indication for revision surgeries, and the use of low or high frequency SCS device.

Conclusions:

Limited evidence exists in the literature to support or refute the usefulness of SCS in CRPS. Our experience agrees with the consensus opinion from experts which suggests that SCS should be considered in the treatment algorithm of CRPS when conservative or traditional therapies have failed.

SUBTHALAMIC DEEP BRAIN STIMULATION MODULATES SMALL FIBER-DEPENDENT SENSORY THRESHOLD IN PARKINSON DISEASE.

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Objective: To evaluate prospectively the changes in painful and nonpainful sensory thresholds brought about by STN-DBS in PD patients. Additionally the relationship between sensory changes and the improvement in motor symptoms and pain under STN-DBS.

Methods: We have prospectively evaluated 37 patients with PD before and one year after STN DBS and 35 healthy subjects. We evaluated both large and small fiber-mediated sensory thresholds using a quantitative sensory testing (QST) before surgery during off-medication condition and 01 year after surgery during on-stimulation condition. Hoehn&Yahr scale, UPDRS III, Visual Analogic Scale and SF-36.

Results: Mean age was 57 ± 10 and Hoehn&Yahr off-medication score was 2.80 ± 0.64 . UPDRS-III scores were 19.7 ± 8.2 and 43.5 ± 12.5 in on and off medication conditions, respectively. There was a significant improvement in pain prevalence (78% to 29%; $\chi^2: 15.814$; $p < 0.005$), intensity of pain (VAS= 5.96 ± 2.84 to 1.64 ± 2.48 , $p = 0.001$) and quality of life (SF-36 before= 368.97 ± 153.52 ; after= 562.72 ± 137.56 ; $p < 0.001$). The mechanical detection threshold, warm detection threshold, cold detection threshold and cold pain threshold improved after the surgery ($p < 0.05$) (table 1). There was no difference between the groups with or without pain (table 2). There was no correlation between sensory thresholds and motor or quality of life changes.

Conclusions: This study showed that STN-DBS was associated with a significant relief of ongoing pain and changes in cutaneous sensory thresholds, mostly thermal innocuous and noxious ones. In particular, the modulation of the thresholds was not related to motor treatment. These data will add to the growing knowledge on the mechanisms of action of STN-DBS on NMS in PD.

EFIC5-1074

Pain treatment (invasive): Brain, spinal and peripheral neural stimulation

A NEW PERSPECTIVE ON THE ANATOMY OF THE CERVICAL NERVES DORSAL RAMI AND THEIR ROLE IN ZYGAPOPHYSIAL PAIN AND TREATMENT: A PRELIMINARY CADAVERIC STUDY

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Background information: The course of medial branches of the dorsal rami and subsequent innervation patterns of the zygapophysial joints in the lumbar region has been well documented and has translated into highly successful clinical practice when treating zygapophysial pain. However, less research has been undertaken on the cervical region and the success rates of medial branch mediated interventional pain management are lower. Aim: This preliminary cadaveric study aims to address the higher failure rate in the cervical region by searching for a potential anatomical explanation.

Method: The course of the branches of the cervical dorsal rami were visualised in cadavers, paying particular interest to the articular nerves medial branches, and subsequent innervation pattern assessed.

Results: In all cadavers, levels C2-C7 gave rise to medial branches which were found to innervate the zygapophysial joint of the same level only. Furthermore, in significant contradiction to published works, the articular medial branches were located coursing around and directly over the line of the zygapophysial joint, giving small branches into the joint capsule. At no point were these branches related to the current accepted location and target landmark: the base of the inferior articular pillars.

Discussion: Results from this study strongly suggest that accessing the medial branches at the by using the articular pillar as a landmark is incorrect, and may explain why treatment is not more successful. With this in mind we would suggest further review of target points to take on board this new perspective on the course.

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EFIC5-0534

Human behavioural science: Learning processes

THE ROLE OF PREDICTABILITY IN THE ACQUISITION AND EXTINCTION OF PAIN-RELATED FEAR: A FEAR-CONDITIONING PARADIGM USING TACTILE STIMULI

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Background and aims: The acquisition and extinction of pain-related fear has previously been investigated using proprioceptive stimuli. However, the relevance of this for fear of touch-related pain has not been tested. This study aims to develop a fear-conditioning paradigm using tactile stimuli, to investigate the acquisition and extinction of cued pain-related fear and contextual pain-related anxiety in the tactile domain.

Methods: The paradigm consisted of two within-subjects conditions: In the predictable condition, vibrotactile stimulation (conditioned stimulus: CS) of a fingertip was either paired with painful electrocutaneous stimulation (unconditioned stimulus: US) of the wrist, or was never paired with the US. In the unpredictable condition, the CS was never paired with the US. Instead, the US occurred at variable time points during the inter-trial interval. In the extinction phase there were three between-subjects groups: Extinction (only predictable trials), Exposure (only unpredictable trials), and Control (both predictable and unpredictable trials). For the Extinction and Exposure groups the US was not presented. Dependent variables were self-report ratings, including US expectancy and CS-evoked fear, as well as skin conductance, heart rate, and fear-potentiated startle reflex.

Results: Data analysis is currently ongoing and results will be presented at the meeting.

Conclusions: The results will demonstrate whether current findings relating to fear of movement-related pain can be generalized to another domain, specifically having implications for extending the fear-avoidance model to more generalized chronic pain disorders that are characterized by tactile allodynia.

WHEN LEARNING TO AVOID PAIN: THE ROLE OF MOTIVATION

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Background and aims: According to current models, avoidance behavior is a major risk factor for chronic pain. Surprisingly little is known about how avoidance behavior is learned. Using a novel probabilistic learning paradigm, this study aimed at testing (1) whether individuals learn to actively avoid painful stimulation, (2) whether avoidance is maintained, and (3) how motivation impacts avoidance.

Methods: N=54 students participated in a probabilistic learning task which entailed high and low painful electrical stimuli (max. 5s). Moving a joystick terminated painful stimulation with each diagonal randomly assigned to one pain intensity. Moving the joystick in one direction of the diagonal terminated pain stimulation with a probability of 70% (high probability) as opposed to 30% (low probability) when moving in the other direction. There was a learning phase (3 blocks) for each pain intensity and a final transfer phase.

Results: Regardless of pain intensity, participants successfully learned to avoid the pain stimuli as revealed by joystick movement and perceived contingency for high and low probable movement direction. This avoidance behavior was maintained during the transfer phase when both high and low painful stimuli were presented. Reaction time was significantly lower for the high versus low pain stimulus and high versus low probable movement direction, especially during the learning phase.

Conclusions: Using a realistic, i.e. probabilistic reinforcement, we show that individuals learn to successfully avoid pain by relying implicitly on reinforcement contingencies. When motivation was high, participants engaged more rapidly in such avoidance behaviors, thus underlining the importance of motivational factors.

PAIN CATASTROPHIZING AND CONDITIONED PAIN-RELATED FEAR: EVIDENCE FOR MUTUAL INFLUENCES

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Background and aims: Pain catastrophizing constitutes a key psychosocial risk factor for chronic pain. For example, the fear-avoidance model postulates that catastrophizing leads to pain-related fear. Intriguingly, little is known about the mutual influence of pain-related learning and catastrophizing. The aim of this study was to test (1) whether trait catastrophizing promotes conditioned pain-related fear, and (2) whether conditioned pain-related fear alters catastrophizing.

Methods: 80 students underwent classical conditioning. High and low painful electrical stimuli served as unconditioned stimuli (UCS). Three identical vibratory stimuli administered at different sites on the arm served as conditioned stimuli (CS). The CS- was never followed by an UCS. One CS+ was followed by the high (CS+high), the other CS+ (CS+low) by the low painful UCS with a contingency of 80%. Participants rated subjective valence and perceived safety for each CS type. Moreover, state catastrophizing was assessed. Trait catastrophizing and depressive symptoms were measured prior to the experiment.

Results: High painful UCS led to a greater conditioned fear response (valence, perceived safety) in comparison to low painful UCS (or no UCS). Trait catastrophizing correlated significantly with conditioned perceived threat of the CS+high/low. At baseline the correlation between trait and state catastrophizing was small. However, after conditioning state catastrophizing in a regression analysis was best predicted by perceived threat of the CS+high and baseline state catastrophizing.

Conclusions: Pain catastrophizing both contributes to learned pain-related fear and is shaped by pain conditioning. Our findings provide first evidence for dynamic changes in catastrophizing depending on pain-related learning.

PREFRONTAL-STRIATAL REGIONS SUPPORT INSTRUMENTAL ESCAPE FROM TONIC PAIN.S. Zhang¹, H. Mano², B. Seymour³¹*Department of Engineering, University of Cambridge, Cambridge, United Kingdom*²*Center for Information and Neural Networks,**National Institute for Information and Communications Technology, Osaka, Japan*³*Department of Psychology and Behavioural and Clinical Neuroscience Institute, University of Cambridge, Cambridge, United Kingdom*

Background and aims: Understanding the transition from pain to relief and its encoding in the brain is important, especially for assessing the brain's reaction and adaptation to pain interventions, and potentially for understanding subjective pain/relief experience. In conditioned escape learning, behavioral responses are learned in order to terminate an already present aversive stimulus. This paradigm, adapted from animal learning literature, offers the opportunity to study the neural mechanism of pain relief from a learning/motivational perspective.

Methods: We used the offset of tonic heat pain in healthy participants as an experimental model of relief from chronic pain. We implemented an instrumental escape conditioning task, in which visual cues signaled behavioral responses can lead to probabilistic, temporary pain relief (tonic heat offset). A yoked Pavlovian conditioning task was implemented to differentially examine the role of motivation and control in the transition from pain to relief. We recorded skin conductance and pain/relief ratings during our functional neuroimaging experiment.

Results: Subjects reliably learned to select actions to achieve pain relief, and learning was computationally well-modeled as a reinforcement learning process. The comparison between instrumental and Pavlovian relief acquisition revealed a specific role for striatal-medial prefrontal brain regions (Fig.1).

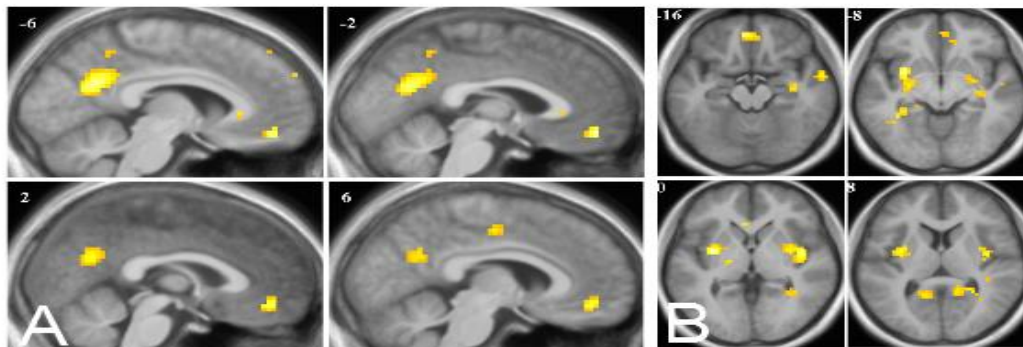


Figure 1. A: sagittal, B: axial view of instrumental > Pavlovian contrast for pain relief outcome ($p < 0.001$).

Conclusions: The findings show that medial prefrontal striatal circuits have a specific computational role in instrumental (operant) learning of pain relief. This has relevance for our understanding of chronic pain, as these same regions show early resting state differences in patients who eventually developed chronified lower back pain.

Acknowledgements:

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ACQUISITION OF FREE-OPERANT PAIN-RELATED AVOIDANCE BEHAVIOR USING A 3 DEGREES-OF-FREEDOM ROBOTIC ARM*A. Meulders¹, M. Franssen¹, R. Fonteyne², J.W.S. Vlaeyen¹*¹*Psychology, Research Group on Health Psychology, Leuven, Belgium*²*Psychology, Center for Learning Psychology and Experimental Psychopathology, Leuven, Belgium*

Ample experimental research endorses the role of associative learning in the acquisition of pain-related fear. Nevertheless, these studies typically focused on self-report and physiological measures of fear. Avoidance behavior, which is overt behavior that prevents the occurrence of an aversive stimulus, has been largely neglected so far.

Therefore, we aimed to fill this gap and developed a novel operant conditioning procedure, allowing for the measurement of avoidance behavior.

Participants in the Experimental Group learned to move their arm from a starting location to a target location using the HapticMaster, a 3 degrees-of-freedom robotic arm. Three movement paths lead to the target location. If participants take the easiest and fastest trajectory, they received a painful stimulus (Path1=100% reinforcement). If they diverged from this fast trajectory, and took a longer route, they were able to prevent the painful unconditioned stimulus (pain-US), but more effort (i.e. force and distance) was needed to complete these routes (Path2=50% and Path3=0% reinforcement). The Yoked Group was subjected to the same reinforcement schema irrespective of their own behavior. Avoidance behavior was operationalized as the maximal distance from the fastest trajectory. We also collected verbal ratings of US-expectancy and pain-related fear.

Deviations from the fastest trajectory were larger in the Experimental than in the Yoked Group (see Figure 1). Moreover, they had higher pain-related fear and US-expectancy ratings for Path1 vs. Path2 vs. Path3, but participants in the Yoked Group did not.

To conclude, we successfully showed the acquisition of conditioned avoidance behavior using a free-operant learning task.

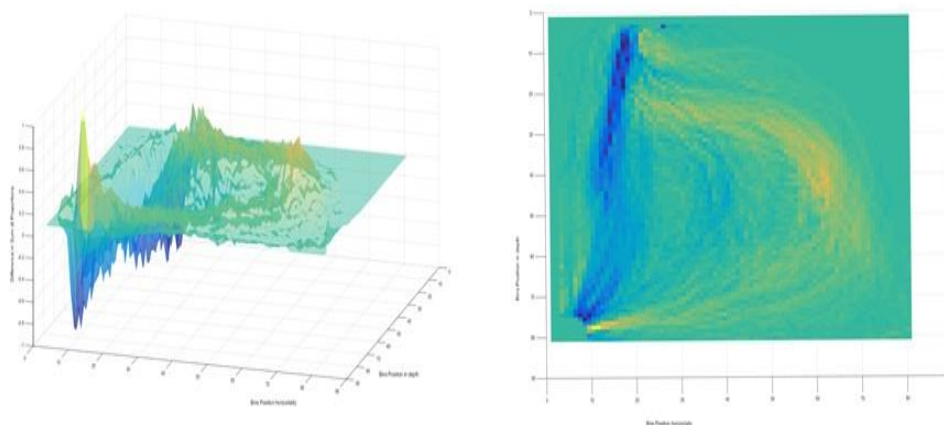


Figure 1. Difference scores between groups of summarized trajectories viewed from the side (left panel) and above (right panel).

Note - Top and yellow patterns are indicative of movements predominantly performed by the Experimental Group, whereas bottom and blue patterns are indicative of movements predominantly performed by the Yoked Group.

INHIBITION OF FIBROMYALGIE PAIN

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Background: Pain sensitivity is influenced by baroreflex sensitivity (BRS), involving nucleus tractus solitarius (NTS) mediated inhibition of pain, hypertension and unrefreshed sleep. In contrast to healthy individuals (HC), FM does not show the inverse relationship between BP and pain. Cardiac gated noxious and non-noxious electrical stimuli may normalize this FM dysfunction.

Methods: 30 pain-free normotensive HC and 30 FM experienced two 8-minutes-trials of randomly ordered non-painful and moderate and strong painful electrical stimuli to the fingers immediately *after* the systolic and diastolic peak (experimental protocol), and in a control condition with the same stimuli delivered independently of the cardiac cycle. Clinical pain, sensory, pain threshold, and pain tolerance were assessed before and after the trials. Blood pressure (BP), BRS, and evoked potentials were measured throughout the trials.

Results: Compared to the diastolic peak, N50, N150 and P260 evoked potentials were attenuated during the systolic phase in HC ($p < 0.005$) but not in FM. The early sensory components (N50, N150) showed lower activity in FM during the 1st trial (all p 's < 0.005) and diminished BRS. Pain threshold and tolerance increased by 23.4% and 31.2% in FM after the 2nd trial of the experimental protocol, correlated with increased BP and BRS and decreased in clinical pain (all p 's < 0.01).

Conclusions: The combination of cardiac gated painful and non-painful stimuli reduced fibromyalgia pain. The results suggest reactivation of pain inhibition mediated by variations in BP, and potential efficacy of baroreceptor therapy.

EFIC5-0037

Pain treatment (conservative): Complementary and alternative medicine

THE EFFECTS OF LAVENDER ESSENCE ON THE STERNOTOMY RELATED PAIN INTENSITY AFTER CORONARY ARTERY BYPASS GRAFTING

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Background: Chest pain originating from the operation site is one of the most expressed complains following coronary artery bypass grafting (CABG). Considering of the side effects of pharmacological methods, it is suggested to use nonpharmacological methods such Aromatherapy. This study aimed to evaluate the effectiveness of lavender 2% aromatherapy on the sternotomy pain intensity after coronary artery bypass graft surgery in patients underwent to surgery.

Methods: During this clinical trial study, 50 patients who were candidate of CABG randomly divided into two equal groups. The case group received 15- minute supplemental oxygen through a face mask with two drops of 2% lavender oil, and group control received only supplemental oxygen through a face mask. Data collection tools comprised the demographic data, check list and visual analogues scale (VAS) for pain severity. The pain severity, were assessed before and 5, 30, 60 minutes after aromatherapy. Final data were analysed by t-test and Chi square test.

Results: Findings showed pain perception intensity in the case group was lower than control group at 30 and 60 minutes after the interventions ($p < 0.0001$)

Conclusion: The result indicated that Aromatherapy can be used as complementary methods in postoperative pain reduction. Because it reduced patients require two sedative drugs and avoided expenses of treatment.

THE EFFECT OF GREEN TEA SOLUTION GARGLING ON THE SORE THROAT AFTER CORONARY ARTERY BYPASSES GRAFTING.

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Background: Intubation inside the trachea is an essential way to keep the airway open in a general anesthesia. Sore throat is a prevalent trouble after endotracheal intubation.

Objectives: The objective of this study is to investigate the effect of green tea gargling on sore throat after coronary artery bypass grafting.

Methods: 121 patients have coronary artery bypass grafting was divided into two groups; gargling distilled water and the other group gargling green tea solution. An hour after taking out then, the patients of the interference group were asked to gargle 30cc of green tea and the patients of witness group were asked to gargle 30cc of distilled water every 6 hours up to 24 hour(each patient 4 times).

More ever, the sore throat questionnaire was also filled 6, 12, and 24 hours after removing endotracheal tube.

Results: The results showed that there were no significant differences between the two groups such as patients, age, sex, body mass index, background on smoking and duration of anesthesia.

The study findings suggest that from the aspect of sore throat before interference ($p=0.461$) and 6 hours after interference, there was no significant difference between two groups ($p=.901$). 12 hours ($p=0.047$), also 24 hours after removing the endotracheal tubes, from the aspect of sore throat in two groups of control and experiment, there were significant difference ($p=0.000$).

Conclusion: Gargling green tea solution as anti-inflammation matter and also natural and harmless can reduce the pain of sore throat in patients after removing the endotracheal tube.

MODIFIED MEDICATION WHO-STEP-SCHEME (WITHOUT X-RAY, CT-SCREENING) IN COMBINATION WITH TLA, ACUPUNCTURE, ANALGETIC, PHYTOTHERAPY, PHYSIOTHERAPY, HOMEOPATHY, HEAT TREATMENT, PSYCHOTHERAPY FOR MEDICAL TREATMENT OF ACHILLODYNIE BY TRANG

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Background and Aims: Mayer et Al. determined with runners a prevalence of the Achilles' tendon discomfort of 23.7%. This takes the main location of the discomfort. Therapy attempts to the treatment of Achillodynie are varied.

Methods: In practice it is treated the Achillodynie primarily symptom-oriented, by local or system broad antiphlogistics, cooling or protection. A physiotherapist's broad of offers are, e. g. , ultrasound, electrotherapy, iontophoresis or across frictions. Biomechanically oriented therapy measures are an optimization the shoe training measures, stretch.

For the therapy by means of antiphlogistics short-term of constant pain relief were proved. The therapy by shoe care is widespread. On this occasion, a pain reduction as well as a change of the level tares of top pressure could be proved. After Cortison injection spontaneous Achilles' ruptures were observed piled up.

Results: Hence I have with abovementioned one Therapy methods pain patients all curing with PDA L4 / L5, blockade of Plexus lumbosacralis with therapeutic Localanalgesie without X-ray examination or CT screening with the deep local infiltration of the Nervus Tibialis of the hollow of the knee, calf middle as well as shortly before the Achilles' tendon and more carefully local infiltration tangential of the Achilles' tendon and vertically to the Achilles' tendon up to the upper ankle joint from the back in combination with acupuncture.

Conclusion: On account of these treatments patients with Achilles' tendon discomfort chronically resistant to therapy can carry out a normal life with sporty activity like running, jogging as well as mountaineering.

PROBIOTIC-TREATED MICE DEMONSTRATE LOWER SENSITIVITY TO MECHANICAL STIMULATION

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Background and aims: The lack of a single, proven intervention for chronic pain highlights the complexity and diverse responsiveness to pain. Probiotics have gained high interest as alternatives to pharmacological compounds. Their nature of delivering metabolic modulations has been investigated in several medical conditions. However, their possible effect on pain is not fully investigated. This study aimed at investigating analgesic and antinociceptive effects of *L. Rhamnus*. The effect(s) of a probiotic depends on its metabolic properties, its surface molecules or secreted components and this is the first study testing the effects of *L. Rhamnus* on nociception.

Methods: 6 week-old male C57BL/6NTac mice fed a normal diet (week 1-4) were randomly assigned to 2 groups treated with a single daily dose (1×10^9 CFU) of probiotic *L. Rhamnus* (Test group) or physiological saline (control group) for 4 weeks (weeks 5-8) maintained on the same diet. Sensitivity to mechanical stimulation, as a translational biomarker of pain was assessed by an electronic Von Frey every two weeks.

Results: The test group showed a trend of lower pain sensitivity to mechanical stimulation compared to the control group after two weeks of receiving the probiotic treatment (19.839 ± 0.822 g and 16.700 ± 0.822 g, respectively, $P > 0.05$). This difference became significant after 4 weeks of probiotic administration, (22.083 ± 0.88 g in test group and 12.039 ± 0.88 g in control group; $P < 0.01$).

Conclusions: Probiotic-treated mice demonstrated lower mechanical pain sensitivity. The protective effect of probiotics on nociception circuits could be associated with the anti-inflammatory properties. The exact mechanism needs further investigation.

THE EFFECT OF MUSCLE RELAXATION EXERCISE AND MUSIC THERAPY APPLIED BEFORE DRAIN REMOVAL OPERATION ON PAIN AND PSYCHOMETRIC VARIABLE

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Background and aims: This research was practiced on inpatients in General Surgery Service and patients placed drainage tube in order to analyze the effect of muscle relaxation exercise and music therapy applied before drain removal operation on pain, vital signs and psychometric variables.

Methods: The study was done with 90 volunteers patients (45 experiment, 45 control group) between May and November, 2014. Data were collected using of Patient Identification Form, Visual Analogue Scale (VAS), Life Findings Form, and Hospital Anxiety and Depression Scale (HAD) with the face to face interviews. For the control group, VAS, HAD and Life Findings were noted evaluating 15 minutes before drain removal, just after drain removal and following 15 minutes. Differently from control group, Music (Rast Mode) which had been chosen 15 minutes before operation was listened to the experiment group patients, muscle relaxation exercise was taught and done.

Results: 53.3% of experiment group was women, 61.4% married, 28.9% between 46-60 ages. 62.2% of control group was women, 82.2% married, 33.3% over 61 years of old. It was observed that compared to control group, VAS score and systolic blood pressure, increased just after drain removed in the experiment group, fall more below the initial value after 15 minutes. In terms of placed drain type, number, diastolic pressure, pulse rate, any relationship could not be found between two groups ($p > 0.05$). Anxious patients' VAS value was high. While anxiety score was irrelevant in the experiment and control groups ($p > 0.05$), control group's depression score average was higher than experiment group ($p < 0.01$).

Conclusion: During drain removal operation, nurses have an important position in practice of nonpharmacological methods, and they may prevent unnecessary analgesic usage.

EFFECTS OF MUSIC ON PAIN IN FIBROMYALGIA

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Background and aims: Fibromyalgia syndrome is a chronic disease characterized by sensitive points on the body that manifest common musculoskeletal pains. The aim of the investigation was to determine effects of music on pain in patients with fibromyalgia.

Methods: This randomized clinical trial was carried out in 37 patients with fibromyalgia at a University Hospital, Internal Medicine and Rheumatology Clinic between 1 June-1 December 2014. The patients were divided into 2 groups as an experimental group (n=21) and control group (n=16). The research instruments were used a Descriptive Characteristics Questionnaire, Visual Analogue Scale (VAS), music CD which includes water and wave sounds is recommended by the Turkish Psychological Association for psychological relaxation and Pain Evaluation Form.

Results: According to the findings; the average age of patients was 43.59 years $\pm$ 10.3, 94.6% of women. The fibromyalgia patients had the disease duration ranged from 1 month to 20 years, the average of disease duration was 23.6 $\pm$ 45.5 months and the average of pain intensity was 6.89 $\pm$ 1.64 on the VAS. The experimental group was reported the average of pain on VAS day 1 (5.45 $\pm$ 2.73), day 7 (4.57 $\pm$ 2.71), day 14 (4.14 $\pm$ 2.45) and it was seen significant reduction in pain in listening music group (p = 0.026). A repeated measure analysis of variance controlling for differences between days demonstrated a significant decrease in pain between day 1 and day 14 (p=0.022). There was no significant decrease in pain among control group participants.

Conclusions: Music which may be used as a non-pharmacologic nursing intervention has been found to be effective in controlling pain in fibromyalgia patients.

RELIEF OF CHRONIC NONMALIGNANT PAIN WITH NONPHARMACOLOGICAL THERAPIES USED BY NURSES

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Background and aims: The treatment of non-malignant chronic pain is difficult, due to its complex and varied etiology. The chronic nonmalignant pain relief can be done with pharmacological methods, non-pharmacological or with the combination of pharmacological and non-pharmacological methods. The aim of this study was to determine which are the non-pharmacological procedures commonly used by nurses in relieving chronic nonmalignant pain.

Methods: After approval of the Ethics Committee were interviewed randomly 40 clinical nurses with experience in caring for patients with chronic nonmalignant pain, using a form consisted of eight questions related to the use of non-pharmacological procedures for chronic nonmalignant pain relief.

Results: The study included 32 female and 8 male nurses aged between 23 and 57 years (31.5 ± 7.39 years), with 13 ± 9.5 years of professional practice. The majority (57.5%) of nurses included in the study was single, and the majority (90%) had expertise in nursing, 5% were masters and only 5% were nurse graduates with no specialization. The non-pharmacological procedures most commonly used for pain control in patients with non-malignant chronic pain were: comfort massage (25.0%), massage associated with penumbra (17.5%), massage and changing positions (12.5%), massage and warm bath (12.5%), massage and hot or cold compresses (5.0%), massage and acupuncture (5.0%), acupuncture and warm bath (7.5%) and acupuncture associated with hot and cold applications (5.0%)

Conclusion: The results allow us to infer that comfort massage alone or associated with other procedures is the most used method by nurses to relieve the chronic nonmalignant pain.

EFIC5-0531

Pain treatment (conservative): Complementary and alternative medicine

BENEFIT IN PATIENTS WITH KNEE OSTEOARTHRITIS THROUGH ADJUVANT ELECTRO AURICULAR ACUPUNCTURE VS. MANUAL BODY STIMULATION WITH SELF CONTROLLED ENERGO NEURO ADAPTIVE REGULATION (SCENAR®™)

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Introduction: Knee osteoarthritis (OA) is a major cause of knee pain. Alternative approaches such as electrical auricular acupuncture (EAA) are gaining importance. Another alternative treatment aiming to reduce pain is Self Controlled Energo Neuro Adaptive Regulation (SCENAR®™).

Methods: 46 patients were randomized to the EAA group (n=15), to the SCENAR group (n=14) and to the control group (n=15). Amount of rescue medication, pain intensity (NRS), range of motion (ROM) in the sagittal plane and the pain free walking distance in minutes as well as knee function assessment were evaluated on study day 1, 42 and 70.

Results: Comparing the rescue medication after baseline therapy no significant difference was found between the three groups (p=0,86). In the control group we found a median of 1 [Q1 25%=1; Q3 75%=2], in EAA group a median of 0 [Q1=0;Q3=3] and in the Scenar group a median of 0 [Q1=0;Q3=3]. Highly significant differences of amount of rescue medication were found on day 42 and 70 comparing EAA group and control group (p<0,001), as well as in the Scenar group compared to the control group.

Conclusion: The results of this study show that EAA and Scenar in combination with medical analgesic treatment are superior to medical analgesic treatment alone. Pain relief was maintained one month after the therapy was discontinued in these two complementary methods. Further studies are necessary to evaluate long lasting effects in knee OA.

COMPARISON OF THE EFFECT OF MASSAGE AND BREASTFEEDING ON RESPONSE TO PAIN DUE TO VENIPUNCTURE AMONG HOSPITALIZED NEONATES IN NICUS.

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Background: Untreated procedural pain, lead to long-term and short-term complications in neonates. The role of nurses in pain management and reducing these complications is quite essential. Preventing pain in sick and neonates, whose condition is getting worse, not only is professional and legal duty, but also decreases psychological and even neurological complications in the future. So, it is imperative for nurses to prevent pain in neonates. The aim of this study is to compare effects of massage and breast milk on the pain of the neonates.

Methods: This was a quasi-experimental study with 75 term & near term infants requiring a venipuncture while being studied. Infants were randomly allocated to groups: 1, breastfeeding (n = 25); 2, massage (n= 25); 3, control (n = 25). In the first group, Venipuncture was done two minutes after breastfeeding. In the 2nd group, Venipuncture was done two minutes after massage. The Neonatal Infant Pain Scale (NIPS) used for measurement of pain score in the first 30 seconds of venipuncture. Data analyzed with SPSS software using t-test and one-way analysis of variance.

Results: The findings of the present study indicated that in massage group the mean pain score was the lowest (0.92). The ANOVA test results showed that all the conducted interventions made a significant reduction of pain score in comparison with the control group.

Conclusions: According to the findings of this study, massage and breastfeeding is a natural, useful and free intervention and don't need any special facility, and suggested in pain management.

ACUPUNCTURE-INDUCED RHO-ASSOCIATED PROTEIN KINASE ACTIVATION IN THE SKIN TISSUES MEDIATES ACUPUNCTURE ANALGESIA

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Background and aims: Though the effectiveness of acupuncture analgesia has been well proven, its mechanism remains still unclear. The aim of study was to identify the role of tissue deformation related proteins evoked by acupuncture needle rotation in acupuncture analgesia.

Methods: Acupuncture was performed on the GB34 acupoint of mice. Then, the expression levels of ROCK1, ROCK2 and p-ERM in the skin tissues were determined 5, 10, 30 and 60 minutes after acupuncture needling. To investigate the correlation between the local molecular signaling, ERK inhibitor U0126 (0.8 µg/ul) and ROCK inhibitor Y-27632 (0.3 µg/ul) were injected into GB34 acupoint before acupuncture needling, and then the expression levels of ROCK2, p-ERK and p-ERM were determined. To investigate whether peripheral ROCK activation has a critical role in mediating acupuncture analgesia, we treated Y-27632 before acupuncture needling then assessed the nociceptive behaviors and mechanical threshold in the formalin and CFA induced mouse pain model.

Results: After acupuncture needling, ROCK2 was activated significantly 30 and 60 minutes later, whereas ROCK1 activation was not significant. P-ERM was significantly activated 5 and 10 minutes after acupuncture needling. Acupuncture-induced ROCK2 and p-ERM expression were significantly attenuated by U0126, whereas, p-ERK and p-ERM expression were not attenuated by Y-27632. In the formalin and complete Freund adjuvant induced mouse pain model, acupuncture attenuated the nociceptive behaviors and the mechanical threshold, and these acupuncture analgesia were blocked by Y-27632 administration.

Conclusion: This study indicates that acupuncture-induced ROCK2 expression in the skin tissues plays a trigger role in mediating acupuncture analgesia.

EFIC5-0815

Pain treatment (conservative): Complementary and alternative medicine

CAFFEINE INTAKE INTERVENES ADENOSINE-MEDIATED ANALGESIC ACTION OF ACUPUNCTURE

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Background and aims: Acupuncture is a popular treatment for the wide spectrum of chronic pain but remains controversial due to our incomplete understanding of its biological basis. We previously showed that in an animal model the analgesic effect of acupuncture is mediated by the steep increase of extracellular purines and subsequent activation of adenosine A1 receptor at the acupuncture point. Such transient purine increases were also present with acupuncture in human. Since caffeine is a potent adenosine receptor antagonist and present in wide variety of foods and drinks, we here tested the effect of daily caffeine intake in the efficacy of the adenosine-mediated analgesia.

Methods: We used adult mice with osteoarthritis pain, evaluated by measuring mechanical allodynia. Acupuncture was given at ST36 (Zusanli) acupuncture point.

Results: Systemic caffeine abolished the analgesic effect of CCPA given at the acupuncture point, indicating that caffeine can counteract the local adenosine analgesia. Furthermore, daily intake of caffeine at middle and high doses suppressed the effect of acupuncture. The action of caffeine was not on central nervous system, since local administration of caffeine at the acupuncture point abolished the analgesic effect as well.

Conclusions: our data indicate that caffeine consumption interferes with the outcome of acupuncture therapy. No clinical studies on acupuncture have taken caffeine intake into consideration. Caffeine intake may contribute to the contradictory data from the various clinical studies on the effect of acupuncture. Moreover, caffeine intake habits can be an important factor when potential chronic pain patients consider acupuncture therapy.

EFIC5-0903

Pain treatment (conservative): Complementary and alternative medicine

THREE NONINVASIVE INTERVENTIONS FOR PHYSIOLOGIC LABOUR PAIN MANAGEMENT: USE OF BIRTH BALL, SACRUM- PERINEA HEAT THERAPY, AND COMBINED USE OF THEM DURING ACTIVE PHASE

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Labor pain is a natural unique, which may bring major distress for women and must manage with safe method.

Aim: To evaluate the effectiveness of birth ball usage, sacrum-perineal heat-therapy and combined use of them during active phase of physiologic labour.

Methods: In this Randomized control trial, 120 Primiparous volunteer with age 18-35 years old, gestational age of 38- 40 weeks, whom admitted in one of Hospitals of Iran University of Medical Sciences in Tehran, were randomly selected and divided in four groups (Birth ball, sacrum perineal heat therapy, combined use of them, and control group). Tools had three main parts of personal characteristic, client examination form and pain visual analogue scale (VAS). All ethical points were considered.

Results: Equality of Personal characteristics of four groups had been checked and there were no significant differences between gestational age, educational level, occupational, wanted pregnancy, history of abortion. Average of pain score first in birth ball group, then combined group and finally in heat therapy were significantly less than control group. Average of pain score in birth ball group and combined group during after 30 minutes use were significantly less than control group but in the heat therapy group average after 60 minutes use were significantly less than control group. (P.value< 0.05) **Conclusion:** Highest decrease of labor pain was in birth ball group. It is suggested that that Obstetrics and Midwives consider and use these safe methods for Physiologic labour pain management.

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EFIC5-0965

Pain treatment (conservative): Complementary and alternative medicine

INTRODUCTION OF NOVEL VIBRO-ACUPUNCTURE - A PSYCHOPHYSICAL STUDY

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Background and aims: To enhance acupuncture effect, a novel acu-vibrator (prototype) has been developed to perform vibro-acupuncture. The present psychophysical study investigated subjective sensations of the new vibro-acupuncture (VA) compared to conventional acupuncture (CA), and placebo acupuncture (PA).

Methods: Thirty young healthy volunteers (9f, 21m) received VA, CA, and PA at sites LI-4 and LI-10 in a randomized and double-blinded manner. The MGH acupuncture sensation scale (MASS), McGill Pain Questionnaire (MPQ), and visual analogue scale (VAS; 0-10) score were investigated after 25 minutes of treatment followed by acupuncture credibility and indication. Adverse events (AEs) were recorded after treatment. Data were analyzed with Friedman rank test and *post hoc* Wilcoxon signed-rank tests with Bonferroni correction.

Results: The MASS scores were significantly higher in CA and VA compared to PA at both sites ($P < 0.017$). Treatment VA evoked significantly higher vibration sensation compared to PA and CA ($P < 0.002$). Treatment PA yielded significantly lower VAS and MPQ score compared to CA and VA ($p < 0.001$) with no difference between CA and VA ($p > 0.550$). Blinding of participants was attained for PA and CA, whereas VA indicated vibration sensation. No serious AEs were recorded for any treatment.

Conclusions: Subjective sensations were influenced by treatment mode with CA and VA yielding higher stimulation responses compared to PA. VA evoked specific vibration sensation beyond the conventional acupuncture which could have different effect on various disorders. Further research is needed to elucidate the specific effect of vibro-acupuncture.

EFIC5-1036

Pain treatment (conservative): Complementary and alternative medicine

COMPLEMENTARY TREATMENT: MILK HONEY CLYSTER WITH REGARDS TO OPIOID INDUCED OBSTIPATION

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Background:

The treatment of pain patient with opioids will result in obstipation. This applies especially to patients in palliative or hospice settings. With respect to the special situation of palliative patients and their quality of life, the treatment of opioid induced obstipation should therefore be mild and not painful.

Methods:

The applications of this milk honey clyster are based on reviewed literature in palliative care and on practical experiences, because currently, there are no evidenced studies regarding this type of clyster. The reason is that it is hardly possible to do evidenced studies with patients in a palliative situation - there are too many ethics questions coming up with this special group of patients.

Results:

The milk honey clyster can be used in all kinds of obstipations in a palliative situation. This kind of clyster is very mild, because it does not cause cramps like other methods. The milk, used with a high fat rate, is important as a lubricant to make the stool soft. The honey absorbs the water contained in the enteric. And because of the lukewarm mixture of milk and honey, it also induces the bowel function.

Conclusion:

This very mild, easy to use and favorable complementary treatment of opioid induced obstipation is a good alternative to known treatments to reduce the obstipation pain for many patients.

EFIC5-0009

Pain treatment (conservative): Physiotherapy

LONE-TERM EFFECTIVENESS OF HOME PROGRAMS WITH PHYSICAL THERAPY AND THAI TRADITIONAL MEDICINE ON PAIN, MUSCLE STRENGTH AND PHYSICAL PERFORMANCE FOR PEOPLE WITH KNEE OSTEOARTHRITIS

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Background and Objectives: In Thailand, home self-care program is now advocated as an essential portion of the management of knee osteoarthritis. Unfortunately, adherence to the home program could be classified as poor. The purpose of this study was to investigate effectiveness of home self-care program with physical therapy (PT) and Thai traditional medicine (TTM) in older people with knee osteoarthritis.

Methods: The study design was long-term (12 months) follow-up of a community-based trial. Two villages were randomly given a different program. Village 1 (n=13) was given a PT program including Swedish massage, resistance exercise and hot bag. Village 2 (n=17) was given a TTM program including Thai massage, exercise with wand and Thai hot herbal ball. All participants were receive booster session for the first 3 months and continued their program for 12 months.

Results: The VAS score in the TTM group had significantly reduced greater than the PT group ($p=0.032$). For muscle strength, the PT group had significantly higher than the TTM group ($p<0.05$). However, the difference between TTM and PT has not been demonstrated in physical performance.

Conclusions: The results suggest a home self-care program with TTM can be effective in improving pain while the PT program had beneficial effect on muscle strength for older people with knee osteoarthritis.

EFIC5-0979

Pain treatment (conservative): Physiotherapy

NEUROMUSCULAR STIMULATION AND CONVENTIONAL PHYSIOTHERAPY IN THE MANAGEMENT OF KNEE OSTEOARTHRITIS: A RANDOMIZED CONTROLLED TRIAL

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Background and Aims: Physical therapy management of knee osteoarthritis (OA) includes a number of diverse treatments but few studies have examined the efficacy of Neuro Muscular Electrical Stimulation (NMES). This study investigated the efficacy of NMES and conventional physical therapy (CPT) in knee OA management.

Methods: This randomized controlled trial recruited 60 patients with grade II knee OA using the Kellgren and Lawrence classification based on X-rays. Purposive sampling technique was used to recruit participants attending physiotherapy clinic at the Federal Medical Centre, Abeokuta, Nigeria. They were randomly assigned into NMES and CPT groups using computer generated permutation blocks. Demographic characteristics were recorded while data on pain intensity (PI), knee range of motion (ROM) and functional status (FS) were assessed using visual analogue scale, universal goniometer and Arthritis Impact Measurement Scale 2 (AIMS2-SF) respectively. In addition to NMES and CPT, all participants underwent kinetic chain exercises thrice a week for 12 weeks. Data were analyzed using descriptive and inferential statistics. Alpha level was set at $p < 0.05$.

Results: The mean age of participants was 52.6 ± 9.8 years. There were more women than men (4:1). Higher significant reduction in PI was observed in the NMES than CPT group ($t=30.51$; p

Conclusion: Neuromuscular electrical stimulation in addition to exercise demonstrated higher significant improvement in pain intensity, flexibility and functional status than conventional physical therapy among patients with knee osteoarthritis.

EFIC5-0920

Pain treatment (conservative): Physiotherapy

SELF-MANAGEMENT INTERVENTION FOR PERSISTENT NECK PAIN: 9-YEAR FOLLOW-UP OF A RANDOMIZED CONTROLLED TRIAL IN PRIMARY HEALTH CARE

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Background and aim: In previous short-term and 2-year follow-ups, a multi-component pain self-management group intervention (PASS) had better effect on pain control, pain-related self-efficacy, disability and catastrophizing than a control treatment; individually administered physiotherapy(IAPT), for patients with persistent tension-type neck pain in a primary care setting. Studies that evaluate long-term effects of self-management approaches towards persistent neck pain are sparse. There is a lack of studies on adherence to favorable pain coping skills and if improvements after interventions are maintained in the long-term. **This study aimed** to compare effects at 9 years after intervention of PASS and IAPT for patients with persistent neck pain.

Methods: Of those 156 persons (PASS n=77, IAPTn=79) initially included to the randomized controlled trial, 129 persons were available for 9-year follow-up. They were sent the same self-assessment questionnaire as previous follow-ups, comprising: The Neck Disability Index, The Self-Efficacy Scale, The Coping Strategies Questionnaire, The Hospital Anxiety and Depression Scale and questions regarding pain, analgesics and health care utilization. Analyses were performed for differences between groups at 9 years using Mann-Whitney-U-test and Fishers Exact Chi-Square test.

Results: Ninety-four participants (73%) responded (PASS n=48, IAPT n=46). Preliminary analyses show that the PASS-group had less disability ($p=0.024$), pain ($p=0.041$), and analgesics consumption ($p=0.044$). There were no significant differences between groups on other outcome measures.

Conclusions: At 9-year follow-up participants in the self-management intervention reported less pain, pain-related disability and analgesics consumption compared to IAPT.

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EFIC5-0033

Pain treatment (conservative): Physiotherapy

EFFICACY OF CONTINUOUS SHORT WAVE DIATHERMY AND INFRARED IN THE MANAGEMENT OF KNEE JOINT OSTEOARTHRITIS: A COMPARATIVE STUDY

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Osteoarthritis (OA) of the knee joint is the most common joint disease and it constitutes a major public health problem especially in the elderly population. Short wave diathermy (SWD) and infrared radiation (IRR) have been crucial modalities used for the management of osteoarthritis but controversy still trails which of SWD and IRR is more effective. The purposes of this study were to compare the therapeutic efficacy of continuous short wave diathermy (CSWD) and infrared rays in the management of knee joint osteoarthritis, to assess the therapeutic effect of continuous short wave diathermy on pain levels of patients with knee joint osteoarthritis and to compare joint range of motion of short wave group and infrared group after the treatment.

Participants were 24 volunteered knee OA subjects receiving treatment at Physiotherapy Department of Obafemi Awolowo Teaching Hospital Complex, Ile-Ife, Osun State. They were randomly assigned into continuous short wave diathermy group and infrared radiation group. Pre and post treatment parameters recorded included present pain intensity and joint range of motion. Descriptive and inferential statistics were used for analysis. Alpha level was set at 0.05. The results revealed that there was a significant reduction in pain intensity of IRR ($f=3.843$, $p=0.045$) and CSWD ($f=11.05$, $p=0.001$) between pre-treatment, 3rd week and 6th week of treatment.

The study concluded that both CSWD and IRR are effective in alleviating pain in patients with knee joint OA more than three months duration of onset.

EFIC5-0034

Pain treatment (conservative): Physiotherapy

THERAPEUTIC EFFICACY OF LOFNAC GEL VIA PHONOPHORESIS IN THE MANAGEMENT OF WITH CHRONIC NON-SPECIFIC LOW BACK PAIN. A RANDOMIZED CONTROL TRIAL

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Seventy patients diagnosed with mechanical low back pain of 3 months duration were assigned in to 2 groups, 35 experimental and 35 control. Subjects in both groups were placed on supervised strengthening exercises for multifidus muscles of the low back. Experimental group was placed on ultrasound phonophoresis therapy with Lofnacgel (diclofenac and methyl salicylate as active ingredients) while the control group was placed on ultrasound with water as coupling medium. The treatment was twice in a week for 6 weeks. Present pain intensity and disability were measured before the treatment, 3rd week and 6th week of treatment. Data was analysed using descriptive and inferential statistics. Post hoc analysis was carried out when necessary

Result revealed that there was a significant difference between the pre-treatment and post treatment pain intensity and disability index for each of experimental ($f=17.947$, $p < 0.001$) ($f=20.712$, $p < 0.001$) and control ($f=14.791$, $p < 0.001$) ($f=10.418$, $p < 0.001$) group. There was also a significant difference between the 6th week experimental and control group of pain intensity ($f=28.76$, $p < 0.001$) and disability index ($f=39.817$, $p < 0.001$).

The study showed that exercise and Lofnac phonophoresis was more effective in the management of patients with chronic low back pain than exercise and ultrasound alone.

EFIC5-0201

Pain treatment (conservative): Physiotherapy

COMPLEX REGIONAL PAIN SYNDROME (CRPS): EFFICIENT MANAGEMENT WITH PHYSIOTHERAPY, ENTONOX, MIRROR BOX THERAPY. A CASE REPORT.

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OBJECTIVE

Complex regional pain syndrome (CRPS) is actually considered as a “neglect like syndrome”.

We report a case of a patient presenting with CRPS, treated by physiotherapy facilitated by the use of ENTONOX, analgesics, and the mirror box.

METHODS

Pain scores and progress of articular amplitudes.

CASE REPORT

A 39 years old woman consulted because of CRPS of her right hand. She received adapted analgesics, ENTONOX (a NMDA antagonist) during physiotherapy and used a mirror box (Ramachandran 1996).

Initially, she presented with a flexed attitude of her 3rd/4th/5th fingers, muscular atrophy and a bluish aspect of her skin. VAS score was 8/10; DN4 score > 5. Motor testing was impossible because of pain.

She managed to open her hand nearly completely after the first session of physiotherapy with analgesics and ENTONOX. She continued her progress in the Rehabilitation Ward, with reduced pain and no vicious attitude of her fingers.

DISCUSSION

Recent research has shown that CRPS can be considered a “neglect like syndrome”. In this case, we associated physiotherapy, adapted analgesia, ENTONOX, and asked the patient to move both limbs, with a mirror box, to trick the brain, reduce pain and gain in mobility of the upper limb. Reducing the pain seemed fundamental for repeated physiotherapy in order to avoid expectations of pain, that could inhibit pain inhibition (Goffaux et al. 2007).

CONCLUSION

Associating ENTONOX, adapted pain analgesics and a mirror box should be useful in the care of patients suffering from CRPS.

EFFECTS OF CRYOTHERAPY AND MUSCLE CONTRACTION EXERCISES IMMEDIATELY AFTER CRYOTHERAPY DURING ACUTE PHASE ARTHRITIS IN RATS

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Background and aims

This study examined the effects of cryotherapy and muscle contraction exercises, immediately after cryotherapy, during acute phase arthritis in rats.

Methods

Twenty-four male Wistar rats were randomly divided into 4 groups: arthritis (AR); arthritis and cryotherapy (CR); arthritis and quadriceps contraction exercises immediately after cryotherapy (CR+Ex); and sham arthritis. Arthritis was induced by injecting a mixture of kaolin and carrageenan into the knee joints of the animals. The acute phase, in this model, occurred 7 days after injection; interventional therapy was provided only during the acute phase. Joint swelling was determined using knee joint width measurements. The knee joint pressure withdrawal threshold was measured using a strain gauge algometer. Hind paw mechanical hypersensitivity was evaluated using von Frey filaments.

Results

Knee joint swelling increases, and knee joint and hind paw pain threshold decreases, 1 day after injection, were not significantly difference among the AR, CR, and CR+Ex groups. However, outcomes in the CR and CR+EX groups recovered well, compared with those in the AR group, throughout the balance of the experimental period. The recuperative outcomes, after injection, were not significantly different between the CR and CR+Ex groups.

Conclusions

Cryotherapy, during acute phase arthritis, can decrease inflammatory symptoms and prevent the induction of chronic pain. Our results also suggest that muscle contraction exercises, immediately after cryotherapy, do not promote inflammatory symptoms.

EFIC5-0309

Pain treatment (conservative): Physiotherapy

THE EFFECT OF POSTURAL CONTROL TRAINING ON PAIN, DISABILITY AND PHYSICAL ACTIVITY IN PATIENTS WITH CHRONIC LOW BACK PAIN (CLBP)

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Background and aims: Disability, postural stability and physical activity (PA) are adversely affected by pain in CLBP patients. The aim of the study was to investigate the effects of technology-based postural control training on pain, disability, postural stability and PA in patients with CLBP.

Methods: Twenty one participants with CLBP (age range 30-60; 18 women, 3 men) underwent a 12-week postural control training using the Biodex Balance System. Visual Analogue Scale (VAS), Oswestry Disability Index (ODI) and Sensewear Armband were used for baseline and follow-up evaluation. Physical activity was assessed using Sensewear Armband and reported as Metabolic equivalents (METs). Biodex Balance System was used not only to assess postural stability but also for postural control training. The overall, anteroposterior and mediolateral postural stability were recorded as postural control evaluation. Wilcoxon signed-rank test was used for data analysis.

Results: Significant improvements were seen in pain (pre-post training: 7-3), disability (pre-post: 60-34) and PA (pre-post: 1.40-1.70 METs) measures ($p=0.000$). There were no significant differences in baseline and follow-up scores of both overall and anteroposterior stability ($p=0.231$ and $p=0.949$, respectively). Mediolateral postural stability was significantly improved after training (pre-post: 0.20-0.10; $p=0.040$).

Conclusions: 12-week technology-based postural control training is safe and effective for decreasing pain and disability, also improving mediolateral postural stability and physical activity in patients with CLBP.

EFIC5-0380

Pain treatment (conservative): Physiotherapy

DEVELOPMENT AND APPLICATION OF NEWLY DESIGNED MASSAGE INSTRUMENT FOR DEEP CROSS-FRICTION MASSAGE IN CHRONIC NON-SPECIFIC LOW BACK PAIN

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Background and aims: To introduce a newly designed massage instrument, the Hand Grip T-bar (HT-bar) and apply to chronic non-specific low back pain (nLBP) through deep cross-friction massage (roptrotherapy).

Methods: 22 subjects (9 males and 13 females, 51.6±6.7 years) with chronic nLBP were allocated randomly to Roptrotherapy group (n=12) and TENS group (n=10). The Roptrotherapy group received deep cross-friction massage with the HT- bar, which was made of metal and had a cylinder for increasing weight and grooves for easy grip. It was applied across the middle and lower back for 20 minutes a day and 3 days a week for 2 weeks. The TENS group received TENS for 20 minutes a day and 5 days a week for 2 weeks. Outcome was measured on the pain numeric rating scale (PNRS), by the Oswestry disability index (ODI) and by the Roland & Morris Disability Questionnaire (RMDQ) at pre-treatment, post-treatment immediately and 2 weeks later. The application of the HT-bar was assessed by questionnaire of 19 therapists.

Results: At post-treatment, immediately and 2 weeks later, both group showed a significant improvement in PNRS, ODI and RMDQ. During the two weeks after post-treatment, however, the Roptrotherapy group improved in PNRS, ODI and RMDQ, but the TENS group did not. Over 80% of therapists responded that the HT-bar was useful and comfortable.

Conclusion: This study suggests the deep cross-friction massage can be a beneficial therapeutic technique and that the HT-bar can be a useful instrument for chronic nLBP patients through deep cross-friction massage

THE EFFICACY OF DIFFERENT TYPES OF MOBILIZATION TECHNIQUES IN PATIENTS WITH PRIMARY ADHESIVE CAPSULITIS OF THE SHOULDER: A SYSTEMATIC REVIEW

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Background and aims: The annual incidences of adhesive capsulitis (AC) are 3 to 5% in the general population and lasts approximately 12 to 42 months. Manual techniques may be of value if applied at the appropriate time and/or combined with other interventions. Little is known about the optimal direction of force and movement application for the joint mobilization to restore glenohumeral motion. Acquired information is needed for the most beneficial physiotherapeutic treatment of patients with primary AC of the shoulder. This systematic review aims to investigate the efficacy of isolated articular mobilization techniques in these patients.

Methods: Eleven RCTs were included and assessed for their risk of bias and relevant information regarding mobilization techniques was extracted. The review was conducted and reported according to the PRISMA- statement.

Results: The efficacy of four different types of mobilization was evaluated: angular mobilization, translation mobilization, manipulation and combined techniques. Angular mobilization can be beneficial in improving both pain and range of motion. With respect to translational mobilizations, posterior glides are preferred to restore external rotation. End-range or high-grade Maitland mobilization and mobilization with movement seem most beneficial; the latter also improves scapulohumeral rhythm.

Conclusions: There is moderate evidence for the use of mobilization techniques in the treatment of patients with primary AC, although in early stages therapists should use mobilization techniques with caution in order to prevent adverse effects. The multi-treatment design limits the generalizability of the finding to normal clinical practice. The timing of therapy is an important issue for future research.

EFFECTS OF NEUROMOBILIZATION MANEUVER ON CLINICAL AND ELECTROPHYSIOLOGICAL FINDINGS IN PATIENTS WITH CARPAL TUNNEL SYNDROME

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Background and aims: To investigate the effectiveness of neuromobilization maneuver when combined with the routine physiotherapy in patients with carpal tunnel syndrome (CTS) by the means of subjective, physical, and electrophysiological studies.

Methods: in this randomized clinical trial study, twenty patients with CTS were assigned into two groups; treatment and control group. In both groups, the patients received the routine physiotherapy including the rest splint, TENS, and therapeutic ultrasound for 4 weeks. In addition to the routine physiotherapy, the patients in the treatment group received the neuromobilization maneuver. The symptoms severity scale, visual analogue scale, functional status scale, Phalen's sign, median nerve tension test, and median nerve distal sensory and motor latency were assessed

Results: There was a significant improvement in symptoms severity scale, visual analogue scale, median nerve tension test, and Phalen's sign in both groups ($P < 0.05$). However, the functional status scale and median nerve distal motor latency were significantly improved only in the treatment group who received the neuromobilization maneuver in combination with the routine physiotherapy. The median nerve tension test and functional status scale in the treatment group were significantly improved ($P < 0.05$) relative to the control group.

Conclusions: Neuromobilization maneuver in combination with the routine physiotherapy improves some clinical findings more effectively compared to the routine physiotherapy. Therefore, this combination can be used as a preferable and effective non-invasive treatment for patients with CTS.

EFIC5-0687

Pain treatment (conservative): Physiotherapy

SEEING THE SITE OF TREATMENT IMPROVES THE EFFECTS OF MANUAL THERAPY IN CHRONIC NECK PAIN PATIENTS

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Background and aims:

Visual feedback (VF) reduces pressure pain sensitivity in people with chronic back pain. Whether VF provides additional pain reducing effects for existing treatment approaches and whether VF influences sensorimotor function is unclear. Therefore, the aim of the present study was to investigate the effects of visual feedback during manual joint mobilization on habitual pain and sensorimotor function.

Method:

Twenty nine neck pain patients were randomly allocated to a single manual therapy session of 5 min duration with (n=14) or without (n=13) real time VF. A blinded assessor conducted outcome measurements like habitual pain intensity, pressure pain threshold (PPT) at the level of C2 and the angulus superior (AS) of the scapula and cervical joint position sense (CJPS) before and after treatment.

Results:

The pre-post mean habitual pain reduction was significantly higher in the VF group ($t(27) = 2.111$; $p=0.044$) compared to the control group. No differences were found between groups for PPT at C2 ($t(27)=1.429$; $p=0.16$) and at AS ($t(27)=1.034$; $p=0.31$), as well as CJPS ($t(27)=0.833$; $p=0.41$).

Conclusion:

VF has an analgesic effect on habitual pain intensity, but no effect on the pressure pain threshold. We assume that different mechanisms account for this observation. Additionally VF had no effect on sensorimotor performance. These results suggest that VF can improve manual joint mobilization. A longitudinal study on this effect is desperately needed.

THE EFFECTS OF SHORT TERM AEROBIC EXERCISE ON MYOFASCIAL PAIN SYNDROME

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Myofascial pain syndrome (MPS) is a common muscular pain disorder. Although various treatment methods have been used to manage MPS, the effects of aerobic exercise on symptoms have not been investigated widely. The aim of this study was to determine the effects of aerobic exercise on symptoms in patients with MPS. Twenty-five patients were divided randomly to receive either physiotherapy (n=13) or physiotherapy and aerobic exercise (n=12) 5 times per week, for 3 weeks. Physiotherapy program included postural and stretching exercises, heat therapy and TENS. The aerobic exercise program included 45 min. of cycling on a bicycle ergometer at 70-85% of maximal heart rate. Sleep quality was measured by Pittsburgh Sleep Quality Index. The severity of fatigue was assessed by Fatigue Severity Scale. Pain was evaluated using Visual Analog Scale during activities and rest. Quality of life was measured by WHO Quality of Life Questionnaire. Both treatment methods have beneficial effects on pain, fatigue and quality of life after treatment when compared to baseline scores ($p<.05$); however, there was no improvement in sleep quality ($p>.05$). Improvement in quality of life and pain level in daily activities was significantly higher in aerobic exercise group ($p<.05$). Improvement in level of fatigue and pain in rest did not differ between the groups ($p>.05$). The findings of this study suggest that the therapeutic effect of combining aerobic exercise with physiotherapy was superior to that physiotherapy alone in patients with MPS. Aerobic exercises can be used as an effective treatment option in MPS.

EFIC5-0916

Pain treatment (conservative): Physiotherapy

EFFECTS OF THE CARRIER FREQUENCY OF INTERFERENTIAL CURRENT ON PAIN RELIEF IN PEOPLE WITH CHRONIC NONSPECIFIC LOW BACK PAIN: A RANDOMIZED PLACEBO-CONTROLLED TRIAL

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Background and aims: Low back pain is an important public health problem. Interferential current (IFC) is commonly used for pain relief, but the effects of carrier frequency of the current and its action on pain relief remain unclear. The aim of this study was to evaluate pain over time and after 12 sessions treatment. **Methods:** A three-arm randomised controlled trial to the group allocation: IFC 1 kHz (n= 50), IFC 4 kHz (n= 50) and placebo (n= 50). The interferential current was applied three days per week over four weeks. **Results:** After treatment, there was no statistically significant difference on pain among the groups 1 kHz x placebo -0.9 (mean difference) 95% CI -2.0 to 0.2, 4 kHz x placebo -0.8 (mean difference) 95% CI -0.3 to 1.9, 1 kHz x 4 kHz 0.01 (mean difference) 95% CI -1.1 to 01.0. The estimated number of sessions needed for a 50% decrease in the pain relief score was 3.82 (95% CI: 2.84 to 4.79) in the 1 kHz IFC group, 5.01 (CI: 3.77 to 6.25) in the 4 kHz IFC group, and 6.09 (CI: 4.82 to 7.37) in the placebo IFC group. There was statistically significant differences only in 1 kHz IFC group compared to IFC placebo group (p = 0.03). **Conclusions:** There was no difference between active IFC and placebo IFC in resting pain intensity after treatment. However, when compared to placebo IFC, subjects receiving 1 kHz IFC took less time to achieve a 50% reduction in pain intensity.

EFIC5-0006

Pain treatment (invasive): Nerve blocks, indwelling catheters

THE USE OF INTRAOPERATIVE TRANSVERSUS ABDOMINIS PLANE BLOCK (TAP) MODULATES POSTOPERATIVE HYPERALGESIA AND REDUCES RESIDUAL PAIN AFTER MAJOR ABDOMINAL ONCOLOGY SURGERY IN CHILDREN

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Aim of Investigation: The use of intraoperative multimodal analgesia has clearly improved postoperative pain control, mortality and morbidity after major surgical procedures. This study tested the hypotheses that increased pain sensitivity assessed by per incisional allodynia and hyperalgesia can occur after relatively large-dose intraoperative remifentanyl and that **transversus abdominis plane block (tap)** prevents this hyperalgesia.

Methods: The present work compares general anesthesia alone (GA group) versus general anesthesia combined to either intraoperative **transversus abdominis plane block** (TAP group: bupivacaine 0.25%) on the development of secondary mechanical hyperalgesia and the incidence of TAP after major abdominal surgery. The area of hyperalgesia for punctuate mechanical stimuli around the incision was measured 48 h after the operation with a hand-held von Frey filament. Mechanical pain threshold was tested before and 48 h after surgery with von Frey filaments with increasing diameters.

Results: In each group, 44 patients were recruited. Total morphine consumption [82 ± 10 vs 34 ± 9 mg, $P = 0.0004$] and the normalized area of hyperalgesia [212 ± 32 vs 79 ± 29 cm², $P = 0.0004$] were significantly decreased in the TAP group. There were no significant differences in mechanical pain threshold levels [1.12 ± 0.21 log(g) vs 1.02 ± 0.24 log (g), $P = 0.5$]. No other side-effects were observed.

Conclusions: An effective intraoperative **transversus abdominis plane block** of nociceptive inputs from the wound using multimodal analgesia contributes to prevent central sensitization and hence reduces TAP after major abdominal operation in children.

EFIC5-0008

Pain treatment (invasive): Nerve blocks, indwelling catheters

DORSAL ROOT GANGLION PULSED RADIOFREQUENCY FOR THE MANAGEMENT OF INTRACTABLE VERTEBRAL METASTATIC PAIN: A CASE SERIES

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Objective: Metastatic bone pain is characteristic of cancer pain and is a form of refractory cancer pain, since the pain includes not only nociceptive but also neuropathic pain. Although some drugs are effective in the management of painful bone metastases, pain while moving is one of the most refractory forms of pain. Although pulsed radiofrequency (RF) dramatically reduces neuropathic pain, chronic pain and vertebral metastatic pain, the number of cases reported in these studies was very small (5 or less).

Design: Case report

Setting: Single pain center

Patients: 15 patients suffering from intractable vertebral metastatic pain

Interventions: Dorsal root ganglion pulsed RF

Outcome Measures: A numerical rating scale (NRS) of pain at rest and while moving

Results: Almost all patients experienced sound pain relief after the pulsed RF treatment. NRSs of the baseline at rest ranged from 1 to 4 (Median, 3). The NRS at rest significantly decreased in three weeks (Median of Day 1, 2; median of Day 7, 1; median of day 21, 1; Friedman test, $P < 0.0001$). NRSs of the baseline while moving ranged from 5 to 10 (Median, 8). The NRS while moving significantly decreased in three weeks (Median of Day 1, 4; median of Day 7, 4; median of day 21, 3; Friedman test, $P < 0.0001$). There were no severe side effects reported.

Conclusion: Dorsal root ganglion pulsed radiofrequency procedure provided sound pain relief for patients with intractable vertebral metastatic pain.

EFIC5-0018

Pain treatment (invasive): Nerve blocks, indwelling catheters

DEXMETOMIDINE AS A SOLE AGENT IN CAUDAL ANESTHESIA IN PEDIATRIC PATIENTS UNDERGOING SURGICAL AND UROLOGICAL PROCEDURES IN COMPARISON WITH BUPIVACAINE

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Background: since introduction of bupivacaine it was routinely administered in caudal anesthesia.

Dexmtomidine was used as an adjuvant to bupivacaine in many studies. can it be used alone what dose? possible effects and undiserable effects will be studied.

Methodology: 40 patients were recruited for this study, divided into 2 groups:

group A: 20 patients were given 2.5 mg/kg bupivacaine diluted to a volume of 0.75 ml/kg diluted in normal saline.

group B: 20 patients were ginen 0.75 mcg/kg dexmetomidine diluted to a volume of 0.75 ml/kg diluted in normal saline.

preoperative blood pressure, heart rate and random blood sugar(RBS) were measured and monitored on surgical incision and then 1hour, 2 hours and 4 hours post incision. objective pain score(O.B.S) was observed for each patient 2 and 4 hours post incision. Random blood sugar was measured 2 post incision.

Results:

Group A: there was significant increase in RBS after 2 hours of incision. O.B.S after 2 hours of incision ranged from 0-3 with a median of 2 and after 4 hours the range became from 1-3 with a median of 2.

Group B: there a less significant increase in RBS after 2 hours of incision. O.B.S. after 2 hours ranged from 0-3 with a median of 1 and remained the same after 4 hours.

Conclusion:

Dexmetomidine when given caudally it has analgesic action that overweighs and last for a longer duration than bupivacaine

EFIC5-0057

Pain treatment (invasive): Nerve blocks, indwelling catheters

TO EVALUATE THE EFFECTIVENESS OF HYALURONIDASE IN THE SELECTIVE NERVE ROOT BLOCK OF RADICULOPATHY. – DOUBLE BLIND, CONTROLLED CLINICAL TRIAL –

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Purpose : To determine the ability of hyaluronidase to provide longer lasting pain relief and functional improvement in patients with lumbar radiculopathy

Methods : A sample size of one hundred twenty six patients per group was necessary. A sample of two hundred fifty three patients who underwent injection procedure with or without hyaluronidase due to radiculopathy were included in this study. The patients were randomly divided into two groups – Control (C) group and Hyaluronidase (H) group. After SNRB due to radiculopathy, VAS was compared at 2, 4, 6, 8, and 12 weeks between two groups and ODI was compared at 12 weeks between two groups. The difference of VAS during the follow up period and the ODI at 12 weeks were analyzed using paired T-test.

Results : The two groups have similar epidemiologic characteristics. The youngest age group (<50 years old) had a lower VAS score at 12 weeks ($p=0.049$) and had less disability at initial evaluation and final follow up ($p=0.046$, $p=0.001$). The VAS was found to be similar in the H and C groups at each period. At 12 weeks, the VAS of H group was more than that of C group, however, the ODI value of H group was less than that of C group.

Conclusions : Adding hyaluronidase to the routine regimen of SNRB delayed the pain recurrence seen from 2 weeks to 4 weeks after injection to 6 weeks to 8 weeks after injection. Further, it resulted in improved functional outcomes at final 3 month follow up as determined by the ODI.

SENSITIVITY AND SPECIFICITY OF DIAGNOSTIC SUPRASCAPULAR NERVE BLOCK ASSESSED BY A MODEL OF EXPERIMENTAL MUSCLE PAIN

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Background: Diagnostic nerve blocks are frequently used to identify the nociceptive focus in painful conditions. However, their diagnostic validity is poorly investigated. Here we propose an experimental pain model that allows calculation of sensitivity and specificity of suprascapular nerve block.

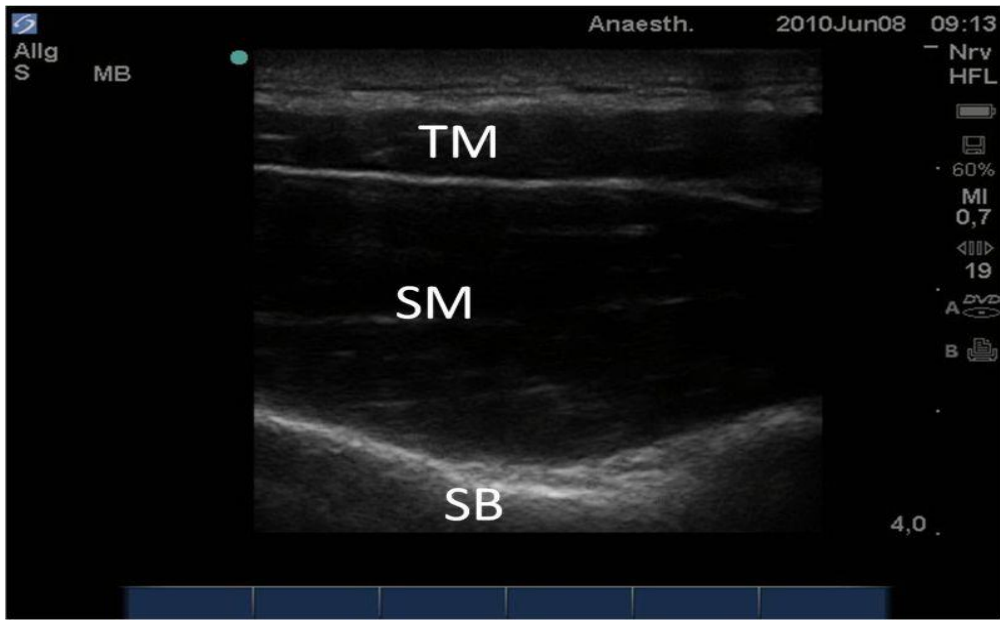
Methods: Pain was induced in healthy volunteers by injection of capsaicin (50 mcg/0.5 ml) at the suprascapular fossa. Ultrasound guidance was used to selectively inject either the supraspinatus or trapezius muscle (picture) in a randomized fashion using the same injection site, thus blinding the participant as to the muscle injected. Subsequent suprascapular nerve block was expected to alleviate supraspinatus, but not trapezius pain because of different nerve supply. The block was considered successful when pain relief was $\geq 80\%$.

Results: Preliminary analysis (n=20) shows greater and faster pain reduction in supraspinatus compared to trapezius pain (RM-ANOVA with interaction, table 1). Sensitivity and specificity for $\geq 80\%$ pain reduction are shown in table 2.

Conclusions: Suprascapular nerve block may have acceptable sensitivity and specificity for the diagnosis of muscular pain. Too rapid spontaneous cessation of capsaicin-induced pain probably accounts for some of the false-positives in the trapezius group, so that specificity is probably underestimated. Capsaicin-induced muscle pain may be a suitable model for evaluation of other nerve blocks.

Table 1	<i>Supraspinatus</i>	<i>Trapezius</i>	<i>p-value</i>
Pain intensity (NRS 0-10)			
Capsaicin+15'	7 (1.8)	6 (1.2)	
Block+15min	1 (0.9)	2 (1.3)	<0.001
Block+30min	0 (0.5)	1 (1.1)	0.015

Table 2	Supraspinatus pain	
	Yes	No
$\geq 80\%$ reduction	14	5
<80% reduction	6	15
	Sensitivity: 0.7 Specificity: 0.75	



EFIC5-0077

Pain treatment (invasive): Nerve blocks, indwelling catheters

EFFICACY OF ULTRASOUND GUIDED BILATERAL OBLIQUE SUBCOSTAL TRANSVERSUS ABDOMINIS PLAE BLOCK FOR POST-OPERATIVE ANALGESIA AFTER PELVIC CANCER SURGERY.

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Background: Patients undergoing abdominal cancer surgery require a multimodal post-operative pain treatment regimen. We evaluate the efficacy of oblique subcostal TAPB for postoperative analgesia after pelvic cancer surgery.

Patients & Methods: Patients in our study were included in one of two groups; each constitute of 20 patients: **Group A:** Members of this group received general anesthesia and at the end of the surgical procedure the transversus abdominus block was performed by ultrasound using bupivacaine as postoperative analgesia. **Group B:** This group served as the control group, Members of this group received general anesthesia and at the end of the surgical procedure the transversus abdominus block was performed by ultrasound using placebo (normal saline).

Results: Comparing the pain score (visual analogue score) of the two groups at 3,6,12 and 24 postoperatively revealed that there was significant difference in analgesic effect in the group given bupivacaine (group A) comparing to the other group (group B).

Table 1: first rescue of analgesia & total morphine consumption

	Group A		Group B		
	N = 20		N = 20		
	Mean		Mean		P
First rescue (hours)	7.21	±4.371	0.50	±0.538	< 0.001
Morphine in mg (24 hour)	6.75	±5.399	22.60	±4.728	< 0.001

v Conclusion: oblique subcostal TAPB is an effective and safe method in postoperative analgesia to the whole abdominal wall after abdominal surgeries.

EFIC5-0083

Pain treatment (invasive): Nerve blocks, indwelling catheters

PARAVERTEBRAL BLOCK IN A PREGNANT WOMAN TO MANAGE THORACIC PAIN AFTER THORACIC SYMPATHECTOMY

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Background and aims

Analgesia management during pregnancy is stressful and frequently neglected due to the possible teratogenic effects caused by medication. We herein report a case of thoracic paravertebral block (TPB) in a pregnant woman to mitigate a disabling pain after thoracic sympathectomy.

Methods

An eight-week pregnant woman, submitted to bilateral thoracoscopic sympathectomy for palmar hyperhidrosis, developed an incapacitating pain after surgery. She was taking acetaminophen, metamizole and gabapentin, withdrawing the last two after acknowledging she was pregnant. She came to us with neuropathic pain [visual analogue scale (VAS) max-9; mean-7].

Results

Two TPB were performed, in the first procedure a loss of resistance technique was used (T5-T7), and in the second, ultrasound guidance (T7). The local anaesthetic used was ropivacaine 0,2%, 3ml for each level in the former procedure and 10 ml in the latter. After the first intervention, a significant relief of her pain was documented (from 9 to 4 in VAS), and afterwards oral acetaminophen was used occasionally. Three months later the patient returned again with pain complaints (VAS 6) after a strenuous physical exertion. Since the second intervention the patient reports a great improvement in quality of life, with minimal pain, and without daily medication requirements. To the best of our knowledge this is the first report of a TBP on a pregnant woman to treat neuropathic thoracic pain.

Conclusions

TBP is an efficacious method on thoracic pain management during pregnancy. Clinical judgment, assessment of the risks/benefits for the individual patient, and careful follow-up are needed.

INTERSCALENE BLOCK MORE INFRACLAVICULAR BLOCK IN THE PROXIMAL HUMEROUS FRACTURE IN THE ELDERLY: PRELIMINARY DATA

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Aim: This study shows that the Interscalene block more infraclavicular block, compared with general anesthesia, improves the elderly patients, which should be subject to intervention by the proximal humerus fracture with intramedullary nail placement.

Material and Methods: We included in this study 40 patients ASA II-III. A first group (B-20 pts) received the administration of ropivacaine 0.5% 20 ml in interscalene block and ropivacaine 0.5% 20 ml in infraclavicular block. A second group (G-20 pts) underwent general anaesthesia. Number rating scale (NRS 0-10) administered soon after the awakening and then 1, 6, and 12 hours after the end of the surgical procedure.

Results: From the results obtained from the evaluation of the two groups (as reported in the tables below) we documented that there are any substantial differences in the values of the NRS. In group B, in the first 12 hours after the surgical procedure, all patients have an NRS compressed between 0 and 3. In the group G, however, only 5 patients had an NRS 0 and 15 patients required a rescue dose of analgesics. In addition patients in group B, if not affected by surgical complications or otherwise, were discharged on average 24 hours earlier than group G.

Conclusion: In conclusion these results confirm that the Interscalene block more infraclavicular block, in the proximal humerus fracture, compared to general anesthesia and intravenous analgesia, improves the outcome of the patients, reduces the side effects associated with opioids and NSAIDs administration, allows early ambulation and eating of the patients, as well as the management costs thus ensuring an early hospital discharge; therefore, it could represent some savings in health care.



EPIDURAL ANALGESIA OR CONTINUOUS LUMBAR PLEXUS BLOCK IN TOTAL HIP ARTHROPLASTY?

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Aim: Total hip arthroplasty (THA) is a common surgical procedure. It is associated with severe pain after surgery. Good acute pain control can be provided with regional anesthesia techniques. The purpose of this study is to compare the continuous epidural analgesia and continuous lumbar plexus block as analgesia in THA.

Materials and methods: We examined 80 patients between 60 and 70 years old, ASA II-III. All the patients were subjected to spinal anesthesia with levobupivacaine 0,5% at variable dose between 13 and 15 milligrams. A first group of 40 patients (Group A) received epidural analgesia with Ropivacaine 0,3% for 24 hours (4-7,5 ml/h). A second group of 40 patients (Group B) underwent to continuous lumbar plexus block with Ropivacaine 0,3% in for 24 hours (4-7,5 ml/h). A numerical rating scale (NRS 0-10) was administered at 6, 12, and 24 hours after the end of the surgical procedure. Endpoints were postoperative pain scores, adverse events, and length of hospital stay.

Results and Discussion: They are reported in the tables below. For the inferential analysis we used the U Mann-Whitney test. In both groups NRS had p values >0.05. We documented that there aren't any substantial differences in the values of the NSR in both groups.

Conclusions: Continuous lumbar plexus block is a more effective analgesic modality and reduces the risks that may incur during the execution of epidural analgesia.

References: Højer Karlsen et al. Postoperative pain treatment after total hip arthroplasty: a systematic review-Pain. 2015 Jan; 156 (1):8-30.

Tab. 1- Group A			
	Average	SD	p value
NRS 0	0.51	0.09	0.88
NRS 6h	2.32	0.25	0.99
NRS 12h	1.22	0.13	0.38
NRS 24h	0.93	0.11	0.44

Tab. 2- Group B			
	Average	SD	p value
NRS 0	0.33	0.03	0.91
NRS 6h	1.39	0.17	0.64
NRS 12h	0.92	0.13	0.76
NRS 24h	0.54	0.06	0.92

EFIC5-0146

Pain treatment (invasive): Nerve blocks, indwelling catheters

NEUROLYTIC INTERCOSTAL NERVE BLOCK FOR CANCER RELATED CHEST WALL PAIN

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Background and aims-

Chest wall pain secondary to tumor invasion of chest wall structures can be challenging to manage. It is often neuropathic and refractory to even strong opioids.

Interventional procedures can be considered for refractory neuropathic cancer pain. Interventional techniques for cancer related chest wall pain include intercostal nerve blocks with neurolytics (alcohol, phenol), radio-frequency ablation and video assisted thoracoscopic neurectomy of intercostal nerves.

Methods-

A 65 years old male patient with right sided malignant mesothelioma eroding 3rd to 7th rib was seen for the management of his severe chest wall pain.

His numerical rating scale for pain (NRS) of 8/10, DN4 neuropathic pain score 7/10, along with drowsiness and lack of appetite.

Using 0.7 mls of 6% phenol, under ultrasound guidance using out of plane technique intercostal nerve blocks were performed at 3rd-7th ribs.

Results-

Post procedure follow up revealed NRS of 3/10 scores, DN4 scores 4/10, improved appetite, sleep with marked reduction in opioids.

Intercostal nerve blocks with phenol can be effective in providing analgesia; can help reduce adverse effects of high doses of opioid analgesia. The analgesic effect can often persist till the end of life.

Conclusion-

Intercostal nerve block with phenol can be an effective way of management of intractable chest wall pain in patients with advanced cancer. Use of ultrasound with low volume phenol can minimize the complications associated with this procedure. Higher volumes can diffuse along the spinal nerves or paravertebral venous plexus in to the subarachnoid space leading to spinal cord injury and paraplegia.

WHAT IS THREATENING ABOUT PAIN? DEFENSIVE REACTIONS TO NOXIOUS HEAT IN CHRONIC PAIN PATIENTS AND HEALTHY CONTROLS

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Background and aims: The startle reflex is potentiated by phasic pain, but not by tonic constant pain, suggesting that defensive reactions to pain might depend on pain-associated threat. Aim of this study was to compare startle responses to two tonic heat pain conditions with varying threat levels in a sample of chronic pain patients and matched controls. We expected potentiation of startle in the high threat compared to the low threat condition which might be more pronounced in pain patients.

Methods: Pain patients (N = 19) and matched pain-free controls (N = 19) underwent both conditions in balanced order. The only difference between the two conditions was that in the high threat condition 50 % of the trials were announced to include a short further noxious temperature increase at the end. Startle tones were presented prior to this temperature increase still in the phase of anticipation.

Results: We observed startle potentiation in the high threat compared to the low threat condition only in those participants who completed the high threat condition first. There was no difference in startle responses between pain patients and pain-free subjects despite higher anxiety levels in the patients.

Conclusions: Our results suggest that subjective threat is influenced not only by stimulus characteristics but also by previous experiences. Additionally, it seems that pain patients' tendency to associate pain with higher threat than healthy persons might not apply to experimental pain.

Acknowledgements: This study was supported by a research grant from the Deutsche Forschungsgemeinschaft (La 685/6-3).

WINNING OR NOT LOSING? THE IMPACT OF NON-PAIN GOAL FOCUS ON ATTENTIONAL BIAS TO PAIN SIGNALS

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Background and aims. By orienting attention to signals of impending pain, physical harm may be avoided. Empirical evidence indeed suggests that attention is biased to pain signals. However, in these previous studies attentional bias (AB) was assessed in a motivationally inert context, whereas in real life, individuals in pain are often motivated to pursue non-pain goals. Recent studies show that AB to pain signals can be reduced when a non-pain goal is pursued. It remains unknown what characteristics of non-pain goals are important to reduce pain-related AB. This study was designed to elucidate the role of goal focus. We hypothesized that AB to pain signals is more reduced when concurrent non-pain goal pursuit is promotion-focused (gain/no-gain) compared to prevention-focused (loss/no-loss).

Methods. Healthy volunteers performed a spatial cueing task with visual cues predicting presence or absence of painful electrocutaneous stimulation. Larger cue-validity effects for pain cues than for no-pain cues reflect AB to pain signals. This task was combined with a digit-naming task that induced a non-pain goal. Digit-naming performance was tied to monetary compensation: participants could win 5€ (promotion-focused group; $n=31$) or lose 5€ (prevention-focused group; $n=31$). Controls ($n=31$) performed only the cueing task.

Results. Mean cue-validity effect was larger for pain cues than for no-pain cues, indicating small-to-medium AB to pain signals. This bias did not significantly differ between groups.

Conclusions. Neither promotion-focused nor prevention-focused non-pain goal pursuit reduced AB to pain signals. This result calls for further systematic research on pain-related AB in the context of multiple-goal pursuit.

IS ACTIVITY PACING ASSOCIATED WITH BETTER OR WORSE SYMPTOMS FOR PATIENTS WITH CHRONIC PAIN AND/OR FATIGUE?

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Background and aims: Activity pacing is associated with both better and worsened symptoms, and its role in reducing disability among patients with long-standing conditions has been questioned. However, existing studies have measured only limited themes of pacing. We have developed a 26-item Activity Pacing Questionnaire (APQ-26) for chronic pain and/or fatigue containing five themes of pacing: Activity adjustment, Activity consistency, Activity progression, Activity planning and Activity acceptance. This study aimed to assess the associations between the APQ-26 and symptoms of pain, fatigue, depression, avoidance and physical function.

Methods: Cross-sectional questionnaire design study involving adult patients with diagnoses of chronic low back pain, chronic widespread pain, fibromyalgia and chronic fatigue syndrome/myalgic encephalomyelitis (n=257). Data were analysed using multiple regression.

Results: The five pacing themes uniquely contributed to the regression model after adjusting for other important factors. Increased Activity adjustment was associated with increased fatigue, depression and avoidance, but decreased physical function (all $p < 0.05$). Conversely, Activity consistency was associated with decreased pain, fatigue, depression and avoidance but increased physical function (all $p < 0.01$). Activity planning was associated with reduced fatigue ($p = 0.028$), and Activity acceptance was associated with increased avoidance ($p = 0.031$).

Conclusion: Two clear patterns emerged: pacing themes involving adjusting activities were associated with worsened symptoms; whereas pacing themes involving undertaking consistent activities were associated with improved symptoms. Further study will contribute to developing guidelines that recommend pacing themes with empirical benefits.

Acknowledgements: With thanks to the patients and staff of the physical therapy departments of The Pennine Acute Hospitals NHS Trust, UK.

PROMOTION OF MOTOR EXECUTION VIA MYOELECTRIC PATTERN RECOGNITION AND AUGMENTED/VIRTUAL REALITY AS A TREATMENT OF PHANTOM LIMB PAIN

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Background and aims. We have recently developed a novel treatment of phantom limb pain (PLP) based in the promotion of motor execution and appropriate visual feedback. Preliminary results showed it to be effective in chronic PLP patients for whom no other treatments worked previously. However, stump pain was thought to be a contraindication for this treatment, because of the need of muscular activation. Here we report a case study of a patient with chronic PLP and severe stump pain.

Methods. Motor movements of the missing limb were promoted using virtual and augmented reality, as well as gaming (13 weekly sessions of 2 hours). Myoelectric pattern recognition was used to predict phantom movements, which were displayed by a virtual limb providing appropriate visual feedback. The visual analog scale (VAS) was used to track PLP and stump pain. The weighted pain distribution (WPD) was used to track the time profile of PLP (0 min. to 5 max.).

Results. During the first 4 sessions, pain increased as expected because of the workout induced in the stump musculature. However, after the 13th session, PLP measured reduced from 9 to 3 (VAS), which was consistent with a reduction in the WPD from 4.5 to 3. Surprisingly, stump pain was also reduced from 10 to 3 (VAS).

Conclusions. Physiologically appropriate motor execution and visual feedback reduced PLP and stump pain in a patient for whom no other treatment was effective previously. The reduction of stump pain was unexpected and generates interesting questions for further work.

EFIC5-0233

Pain treatment (conservative): Rehabilitation

COGNITIVE BEHAVIORAL THERAPY-BASED EXERCISE FACILITATION METHOD USING THE “IKI-IKI REHABILITATION NOTEBOOK” IN PATIENTS WITH CHRONIC PAIN

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Background and Aims: 'Iki-iki' in Japanese means 'active'. The purpose of this study was to evaluate the efficacy of a cognitive behavioral therapy (CBT)-based exercise facilitation method using the 'Iki-iki Rehabilitation Notebook' for patients with chronic pain. Methods: The subjects were 2 men and 4 women with chronic low back and/or lower extremity pain (18-76 years of age, mean age: 48) for more than 3 months. Indications for using the notebook were as follows: 1) Numeric Rating Scale (NRS) for pain >3, and 2) Brief Scale for Psychiatric Problems in Orthopedic Patients >15. Patients were asked to write in their notebooks daily regarding their emotion, mood, anxiety, and exercise routine (muscle exertion, gait distance). Once every 2 weeks, the patients returned to the clinic to go over the notebook/journal. Results: The PDAS (Pain Disability Assessment Scale) for activities of daily living and EQ-5D for QOL evaluation improved from 28 ± 15 and 0.59 ± 0.08 (mean $\pm$ SD) to 15 ± 11 and 0.70 ± 0.2 , respectively, 4 months after starting to use the notebook, although the NRS did not significantly improve. Conclusion: Japanese Orthopedic Association developed guidelines for the treatment of chronic low back pain, demonstrating with high evidence the efficacy of treatment including exercise, CBT, and education with some journaling. The 'Iki-iki Rehabilitation Notebook/Journal' is a tool to educate patients about the cause and treatment of pain and to actively facilitate CBT-based exercise.

INFLUENCE OF SEDENTARY TIME FOR PAIN, COGNITIVE AND PHYSICAL FUNCTIONS IN PATIENTS WITH ACUTE VERTEBRAL COMPRESSION FRACTURES

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Background and aims

This study investigated the influence of sedentary time, during the early phase of acute vertebral compression fractures (VCFs), on patient pain and cognitive and physical functions.

Methods

Twenty-one female patients with acute VCFs treated conservatively in hospital were eligible for the study. The patients were well before admission (Barthel Index = 100). Activities of the patients were monitored by motion-counter (Lifecorder®, Suzuken, Japan) from the beginning of admission. Patients were divided into active (n=11) and sedentary (n=10) group according to sedentary [zero MET] times in motion-counter during the first week. Following test battery was adopted for assessment, Pain; verbal rating scale (VRS), Cognitive function; mini-mental state examination (MMSE), Physical functions; timed up and go test (TUGT) and 5-time sit-down to stand-up test (SST5), Ability to perform the activities of daily living; functional independence measure (FIM). All outcomes were measured 2 and 4 weeks after admission. Two-way repeated measures ANOVA, followed by Bonferroni post-hoc tests, were used to analyze the data.

Results

Scores of rest-VRS were not significantly different between groups at weeks 2 and 4. By contrast, moving-VRS was significantly reduced at week 4 in active group, only. The MMSE, TUGT, SST5, and FIM scores were not significantly different between the groups at week 2. However, these parameters were significantly improved in the active group at week 4.

Conclusions

Sedentary time, during the early phase of acute VCFs, may influence not only pain during movement, but also patient in-hospital cognitive and physical functions.

ILLNESS PERCEPTIONS, TREATMENT BELIEFS AND HEALTH LITERACY SKILLS OF PATIENTS WITH CHRONIC PAIN-A QUALITATIVE STUDY

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Background and Aims:

Multidisciplinary chronic pain treatments are effective, however on average the effects are limited. Research has shown that patients with negative treatment outcomes had maladaptive illness perceptions about their pain and different treatment beliefs. These beliefs may be related to low levels of health literacy. The aim of this research was to explore the relation between level of health literacy and beliefs patients with chronic pain hold about their illness and its treatment.

Methods:

Patients on the waiting list of a chronic pain program, from two rehabilitation centres in the Netherlands, were interviewed. A purposive sampling strategy was used. A Framework analysis was used. The transcribed interviews were analysed with the Common Sense Model of Self-Regulation and the model of Health Literacy as analytic frameworks.

Results: Eighteen patients were interviewed, 3 males and 15 females, with an age range from 21 to 77 years. A cluster of illness perceptions around *identity, cause, timeline, consequences, and control* were identified. Treatment beliefs about *necessity, concerns, treatment- content/ outcome, active involvement of the patient and hope* were found. Patients with low levels of health literacy tended to show less understanding and less control of their chronic pain compared to patients with normal to high levels of health literacy.

Conclusions: This study highlights the need for health care professionals to be sensitive to the level of health literacy of their patients in chronic pain rehabilitation programs, as this may influence illness perceptions and treatment beliefs.

LOW LEVEL OF HEALTH LITERACY, AN UNDERESTIMATED PHENOMENON IN A CHRONIC PAIN REHABILITATION PROGRAM IN THE NETHERLANDS- A COHORT STUDY.

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Background and Aims: Patients' health literacy is increasingly recognized as a critical factor affecting health communication and - outcomes. In the Netherlands almost 30 % of the Dutch population have low levels of health literacy. Health literacy is defined as the personal, cognitive and social skills which determine the ability to gain access to, understand, and use information to promote and maintain good health. The aim of this research was to explore the level of health literacy in a chronic pain cohort in the Netherlands.

Methods: At the start of a chronic pain program socio-demographic data and levels of health literacy were identified of a cohort of patients with chronic pain. The level of health literacy was measured objectively with the Short Assessment of Health Literacy Dutch (SAHLD).

Results:

Of 87 patients with chronic pain, 62 (71%) patients had low levels of health literacy and 25 (29%) patients had normal to high levels of health literacy.

Conclusions: This cohort study showed that more than 70% of the patients with chronic pain deal with low levels of health literacy. Health care professionals should take this underestimated phenomenon into account in order to adjust chronic pain rehabilitation programs to the individual needs of the patients.

EFIC5-0477

Pain treatment (conservative): Rehabilitation

INTRA-INDIVIDUALLY CONTROLLED SHORT-TERM EFFECTS OF COMPREHENSIVE INPATIENT REHABILITATION IN HIP AND KNEE OSTEOARTHRITIS

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Background and aims. The aim was to quantify pain, function, and health-related quality of life in comparison to normative data and to quantify effects of inpatient rehabilitation in hip and knee osteoarthritis patients.

Methods. This naturalistic, observational cohort study quantified health by the ShortForm 36 (SF-36) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Patients underwent a comprehensive, multidisciplinary inpatient rehabilitation of 3 weeks. The observed score changes during the intervention were corrected by those observed during waiting time prior to the intervention to obtain corrected effect sizes.

Results. Four or more comorbid conditions were present in 45.3% hip (n=88) and 51.8% knee (n=164) patients. On entry, physical and some dimensions of psycho-social health were significantly diminished compared to population norms, e.g. SF-36 physical functioning: mean 36.0 versus norm 68.1 for hip, 30.6 versus 66.2 for knee (both $p < 0.001$). At discharge, hip osteoarthritis had improved by corrected effect sizes of 0.20-0.47 in pain, 0.04-0.39 in function, and (-0.04)-0.32 in psycho-social health. Knee osteoarthritis showed corrected effect sizes of 0.43-0.62 in pain, 0.19-0.51 in function, and 0.19-0.30 in psycho-social health. The improvements were higher than minimal clinically important differences in WOMAC pain for both joints and in WOMAC function for hip.

Conclusions. Hip and knee OA patients admitted to the inpatient intervention were affected by a substantial burden of disease and comorbidities. Inpatient rehabilitation resulted in small to moderate, statistically significant and clinically important improvements in pain, function and psycho-social health.

EFIC5-0522

Pain treatment (conservative): Rehabilitation

EVALUATION OF THE PAIN, NEUROPATHIC PAIN AND SYMPATHETIC SKIN RESPONSE TO TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION TREATMENT IN CHRONIC MECHANICAL LOW BACK PAIN PATIENTS

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Objectives: The aim study was to investigate the effectiveness of transcutaneous electrical nerve stimulation (TENS) in mechanical chronic low back pain, and compare the effects of different clinical application methods of TENS on pain, neuropathic pain, functional status, and sympathetic skin response (SSR).

Materials and Methods: 73 patients, aged between 18 and 65, with mechanical suffering from low back pain more than three months were included the study. After the baseline measurements, patients were randomized to three physical treatment groups. Burst mode TENS was applied at the first group, conventional TENS was applied at the second group while the third group received sham TENS application during 15 sessions. Patients were evaluated by visual analog scale (VAS), LANNS (The Leeds Assessment of Neuropathic Symptoms and Signs), DN4 (Douleur Neuropathique 4 Questions), Modified Oswestry Scoring (MOS), Beck Depression Inventory (BDI) and SSR.

Results: After TENS application, average VAS scores showed statistically significant decrease in whole groups ($p < 0,001$), after treatment showed statistically significant difference between the comparisons of groups. This difference was due to BTENS ($p < 0,05$). After the treatment, LANNS, DN4, MOS, BDI and SSR showed no statistically significant differences between groups ($p > 0,05$).

Conclusions: Burst TENS treatment to lumbar region can be used for short term pain control in chronic mechanical low back pain is an efficient and reliable method.

EFIC5-0858

Pain treatment (conservative): Rehabilitation

SHOULDER AND KNEE PAIN MANAGEMENT DURING REST AND MOBILIZATION IN STROKE PATIENTS FOLLOWING A REHABILITATION PROGRAM

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Background and aims: We are a rehabilitation clinic focused especially on programs for post-acute and chronic stroke patients. As pain and functional impairment are the main reasons of adresability among these patients, our goals are to reduce them both in order to improve their quality of life.

Methods: We developed a study for 2 months to 4 years stroke patients, without any other neurological or psychiatric disfunction, with adequate cognitive status, communication and adherence. The final group was divided in two: one for the patients with a recent stroke (between 2 to 6 months) and the other for sequelar patients (stroke older than 6 months). The pain was assessed at the shoulder and knee, during rest and mobilization, before and after the rehabilitation program and 6 months later.

Results: The differencies between the two groups are not statistically significant regarding pain measured with Numeric Rating Scale, as they both showed a significant improvement in pain perception.

Conclusions: Shoulder and knee pain assesement in rest as well as in mobilization at the end of the treatment and six months later revealed better scores for most of the patients diregarding the moment stroke occured and highlighting the importance of the rehabilitation program concerning pain improvement.

AMPUTATION AND PHANTOM PAIN: A NEURO-PSYCHOMOTOR REHABILITATION APPROACH TO BODY-IMAGE FOR AMPUTEES

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Background and aims: When body integrity is suddenly broken down, as is the case in amputation, the body-image in the somatosensory cortex undergoes a striking reorganization generating one of the hardest neuropathic pain syndromes to treat : phantom-limb pain (PLP). The 2010-earthquake in Haiti resulted in thousands of amputees most of them suffering from PLP. The Swiss Faculty of Psychomotricity (HETS-Geneva) along with the Haitian Faculty of Medicine (UEH) have developed a new PLP-therapy designed to specifically act on amputees' disturbed body-image.

Methods: Twenty-seven amputees with chronic PLP (>2 years) were seen twice a week for an 1-hour neuro-psychomotor session. The therapy focused primarily on sensory-stimulation whilst integrating body-image reconstruction and emotional factors. Body-image and PLP changes were assessed through a pre-test/post-test paradigm using 1) the Gallagher-MacLachlan's TAPES Questionnaire; 2) the West-Haven-Yale Multidimensional Pain Inventory and 3) psychomotor evaluation. Six months post therapy, PLP were evaluated once more.



Results: In all patients, PLP decreased and ultimately vanished. 24/27 patients reported PLP disappearance in less than 2.5 months. Phantom sensations remained for one patient and another reported one episode where PLP resurfaced in an emotional context. PLP did not reappear 6 months post therapy.

Conclusions: The strategy ahead is to develop a low-cost therapy improving the rehabilitation of PLP in poorer countries. By seeking global restructuring of amputees' disturbed body-image, the neuro-psychomotor rehabilitation therapy developed by the authors has proven to be a straightforward remedy offering a novel non-pharmacological treatment of PLP.

Acknowledgments: Supported by the Swiss partners: SSI-Geneva, HES-SO, HETS-Geneva, Alconi.

STUDY FOR COMPARISON OF VARIOUS DISABILITY SCALES IN CONSERVATIVELY TREATED PATIENTS WITH ACUTE PROLAPSED INTERVERTEBRAL DISC

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Treatment expectation outcomes in radicular low back pain vary due to existence of different measures of success and specific outcome measures. The objective of this study was to compare and correlate clinical pain outcome [visual analogue scale (VAS)] with patient determined objective goals [Oswestry Disability Index (ODI), Roland Morris Disability Questionnaire (RMDQ) and Quebec Back Pain Disability Scale (QBPDS)] in acute and sub acute stages of radicular low back pain managed conservatively. A total of 45 patients with mean age of 34.15 years, who fulfilled the inclusion criteria were recruited and managed conservatively. They were asked to complete VAS and three disability scales viz ODI, RMDQ and QBPDS and were followed at baseline, 10 and 20 days with repeat application of all scales. Statistical analysis was done using intra class coefficient statistics and multiple comparisons by Bonferroni method. VAS revealed consistently strong correlation with the RMDQ score at baseline ($r_0 = 0.776$), first ($r_1 = 0.696$), and second follow up ($r_2 = 0.776$) suggesting it as the best amongst all the measured scales at all times. The performance of ODI and its correlation with VAS reduced from strongly positive ($r_0 = 0.709$) to moderately positive ($r_2 = 0.586$) suggestive of decline in its performance with time. QBPDS had a weak correlation with VAS at baseline ($r_0 = 0.478$) as compared to the other two scales which improved ($r_2 = 0.741$) suggesting its increased utility as the stage progresses. Thus, the treatment progress can be more meaningfully monitored to jointly predict both clinical and functional outcomes.

EFIC5-0993

Pain treatment (conservative): Rehabilitation

EFFECT OF HAND EXERCISE TREATMENT ON PAIN RELIEF IN CARPAL TUNNEL SYNDROME: A SHORT REVIEW

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Background and aims: Carpal tunnel syndrome (CTS) is one of the most common peripheral neuropathies and increased tunnel pressure plays an important role in the etiology. Surgical release is commonly performed in patients but it is recommended to start with a conservative treatment. Due to limited evidence, this article reviews the effect of hand exercises on pain relief.

Methods: Currently, there are several hand exercise methods for CTS such as: repetitive dynamic, static, nerve gliding and tendon gliding exercises. Based on these mechanisms, there are other hand exercises done by a ball or a device.

Results: Study results show that, pain was perceived more strongly by subjects in dynamic exercise than in static exercise. Using the elastic device that is retained in a mouse pad relieves the symptoms of carpal tunnel syndrome with the finger and thumb extending exercises. Pain was reduced after nerve and tendon gliding exercises when added to a conservative therapy approach like splinting after four weeks. In another study, nerve and tendon gliding exercises for one week caused any meaningful pain increase. Ball squeezing exercise was used in another study and pain scores were slightly increased of HD patients with CTS at the first and third months of treatment.

Conclusions: While hand exercise treatments have shown promise in relieving pain, long-term outcomes are not known. In order to clarify the effectiveness of hand exercise treatment on CTS pain severity, evidence based long-term studies are needed.

COMPLETE RECOVERY OF NEUROPATHIC PAIN AFTER NEURO-PSYCHOMOTOR RECONSTRUCTION OF A COHERENT BODY-IMAGE: APPRAISAL REPORT ON TWO CASES

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Background and aims: Neuropathic pain (NP) is the result of a nerve injury affecting the somatosensory system. In amputees, studies have shown a correlation between NP intensity and body-image changes in the somatosensory cortex. Treatments seeking to reduce these changes also reduce NP. Neuro-psychomotricity is a therapy acting specifically on disturbed body-image. This report describes two cases of NP recovery after a neuro-psychomotor treatment.



Methods: The first patient, a 25-year-old woman, suffers a complete spinal cord injury after the 2010-Haitian earthquake. She describes persistent pains in her stomach and lowerback. The second patient, a 40-year-old man, reports continuous NP after a gun assault. The transection of the common fibular nerve was partial, resulting in the loss of somesthetic sensations in the hallux, second toe and inner side of the right foot. The neuro-psychomotor treatment focused specifically on sensory-stimulation, tactile-discrimination and body-image-reconstruction (Fig. 1 and 2).



Results: NP decreased and ultimately vanished after respectively 17 - 4 neuro-psychomotor sessions. No NP resurgences were mentioned over the next 6 months.

Conclusions: Our approach, which concentrates on sensory-stimulation, tactile-discrimination and body-image-reconstruction, enabled NP recovery in two patients suffering from nerve damage. This result can be explained by the exercises, which focus on body-image, allowing the cortex, to once more receive a portion of the lost somesthetic inputs. Our findings support the notion that NP may be alleviated by methods recreating a complete, coherent body-image. Neuro-psychomotricity offers a novel non-pharmacological gateway to NP treatment.

Acknowledgments: Supported by the Swiss partners: SSI-Geneva, HES-SO, HETS-Geneva, Alcon.

INCREASED INTERSTITIAL CONCENTRATIONS OF GLUTAMATE AND PYRUVATE IN VASTUS LATERALIS OF WOMEN WITH FIBROMYALGIA SYNDROME ARE NORMALIZED AFTER AN EXERCISE INTERVENTION

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Background and Aims: Fibromyalgia syndrome (FMS) is associated with central alterations, but controversies exist regarding the presence and role of peripheral factors. Microdialysis (MD) can be used *in vivo* to study muscle alterations. For chronic pain conditions such as FMS, the mechanisms for the positive effects of exercise are unclear. This study investigates the interstitial concentrations of algescics and metabolites in the vastus lateralis muscle of 29 women with FMS and 28 healthy women before and after an exercise intervention.

Methods: All the participants went through a clinical examination and completed a questionnaire. In addition, their pressure pain thresholds (PPTs) in their upper and lower extremities were determined. For both groups, MD was conducted in the vastus lateralis muscle before and after an exercise intervention (15 weeks) of mainly resistance training of the lower limbs. Muscle blood flow and interstitial muscle concentrations of lactate, pyruvate, glutamate, glucose, and glycerol were determined.

Results: FMS was associated with significantly increased interstitial concentrations of glutamate, pyruvate, and lactate. After the exercise intervention, the FMS group exhibited significant decreases in pain intensity and in mean interstitial concentrations of glutamate, pyruvate, and glucose. In addition, the FMS group increased their strength and endurance.

Conclusions: This study supports the suggestion that peripheral metabolic and algescic muscle alterations are present in FMS patients and that these alterations contribute to pain. After an exercise intervention, alterations normalized, pain intensity increased, and strength and endurance improved, all findings that suggest the effects of exercise are partially peripheral.

EFIC5-1023

Pain treatment (conservative): Rehabilitation

EFFECTS OF YOGA BASED EXERCISES PROGRAMME ON PAIN, SLEEP QUALITY, PSYCHOLOGICAL CONDITION PATIENTS WITH TEMPOROMANDIBULAR JOINT DYSFUNCTION

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Purpose: The aim of the study is to investigate the effects of yoga based exercises programme on pain, quality of life and depression in patients with temporomandibular joint dysfunction (TMJD).

Materials and methods: 15 women between 20 and 47 years of age who had TMJD attended this study the subjects participated in the yoga sessions for 6 weeks for one hour three times a week. In the evaluations, pain on VAS, Pittsburgh Sleep Quality Index (PSQT) on the sleep quality and depression level of beck depression inventory were used before and after yoga based exercises program.

Results: Significant difference were found in pain and depression scores of all subjects between pre and post yoga sessions ($p < 0,05$). A positive relationship were found between pain intensity and psychological condition (p

Conclusion: The results of this study showed that Yoga based exercises programme with TMJD decrease pain and depression, but not change sleep quality. We plan the studies to investigate the effects of yoga on sleep quality in greater number of participants with TMJD

EFIC5-0081

Pain treatment (invasive): Spinal analgesia

FEASIBILITY OF CONTRALATERAL OBLIQUE FLUOROSCOPY-GUIDED CERVICAL INTERLAMINAR STEROID INJECTIONS

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Background: Cervical epidural steroid injection (CESI), given in conjunction with local anesthetic, is common remedy for cervical radicular pain and is generally performed under c-arm fluoroscopic guidance, computed tomography (CT), or ultrasound. Interlaminar procedure, such as CESI, typically relay on anteroposterior and lateral (APL) view during needle placement. However lateral view may be obscured by body habits in certain individuals. Swimmer's view or contralateral oblique (CLO) view may be used to avoid this.

Objective: Our intent was to assess technical success and procedural risk in patients subjected to imaged-guided CESI procedure, comparing CT with CLO c-arm fluoroscopy

Methods: A total of 186 of patients were enrolled and randomly assigned to one of three groups undergoing imaging-guided CESI (dexamethsone, 5 mg) via CT or c-arm fluoroscopy (CLO vs APL). Complication rates and technical success were assessed, basing the latter on image reviews to confirm presence of epidural contrast.

Result: All image-guided CESI procedures utilizing CT and CLO fluoroscopy proved technically successful. A swimmer's view was required in two patients assigned to APL views. Injection were performed at cervical level, from C5-6 to C7-T1, with C6-7 level most commonly injected.

Conclusion: CLO fluoroscopy-guided CESI is feasible and safe, comparing favorably with CT-guided CESI

EFIC5-0082

Pain treatment (invasive): Spinal analgesia

OUTCOMES OF PERCUTANEOUS ADHESIOLYSIS AND EPIDUROGRAPHIC FINDING FAIL TO CORRELATE IN PATIENTS WITH LUMBAR SPINAL STENOSIS

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Background: Spinal stenosis is characterized by narrowing of the spinal canal, with mechanical compression of spinal nerve roots. The latter may cause low back pain and/or leg pain, as well as neurogenic claudication. Epidural steroid injection is commonly used to treat patients with lumbar spinal stenosis (LSS), but percutaneous epidural adhesiolysis has been utilized when symptoms prove refractory.

Objective: Our goal was to assess the relationship improvement shown on epidurogram and subjective patient response to adhesiolysis

Methods: For this prospective study, 78 patients with degenerative LSS were enrolled. Each subject underwent magnetic resonance imaging of lumbar spine with all therapeutic procedures conducted in operating room. Two weeks later, second epidurography was performed. Second epidurography was conducted to assess any change in epidural filling defects. Outcome measure obtained using visual analogue scale (VAS) score at 2 weeks post-treatment.

Results: Of the 78 study participants (mean age, 60.9 years; range, 34-85 years), 21 (26.9%) displayed epidural filling defects at baseline. After percutaneous adhesiolysis, epidurographic filling defect were absent in 78% of patients. In the presence or absence of filling defects, mean VAS score were 5.2/10 and 4.5/10, respectively. No significant correlation between post-procedural VAS score and status of filling defects (yes or no) was evident.

Conclusion: In patients with LSS, epidurographic finding following percutaneous epidural adhesiolysis failed to correlate with level of pain reduction achieved.

**IATROGENIC ADRENAL INSUFFICIENCY SECONDARY TO DRUG INTERACTION
BETWEEN RITONAVIR AND INJECTED TRIAMCINILONE**

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Background and aims

A 56 year old lady with a background of type 2 diabetes mellitus had been suffering from post herpetic neuralgia after herpes zoster predominantly affecting the left L1 dermatome. She had a good response to a therapeutic epidural injection as well as antineuropathic medication, TENS and topical treatments. A few months later she was diagnosed with human deficiency virus following a pneumocystis pneumonia.

Due to poor pain control a repeat epidural injection was offered several years later, which was ineffective, however triggered an episode of acute hypoadrenalism, which took three months to recover and was diagnosed after admission with acute severe hyperglycaemia requiring insulin administration, dehydration, renal failure, facial swelling and hyperosmolarity.

Methods

The hypoadrenalism was caused by a drug interaction between the protease inhibitor Ritonavir and Triamcinolone Acetonide, which are both having effects on Cytochrome (CYP) P450 3A4.

Results

Subsequently the Ritonavir was changed to a integrase inhibitor, Raltegravir and a gabapentiod drug was restarted.

Conclusions

Due to the introduction of highly active antiretroviral therapy (HAART) both morbidity and mortality in HIV positive patients have markedly reduced, which will in turn increase the likelihood of patients presenting with chronic pain requiring interventions. Steroids are commonly used by interventional pain physicians, rheumatologists and orthopaedic surgeons and awareness of this significant drug interaction must be raised. Other depot-steroid preparations such as Methylprednisolone appear safe with no reports of adverse events published as yet.

PAIN ANTICIPATION: A POSSIBLE WAY TO UNDERSTAND THE PERCEPTUAL SET OF SELF-REGULATION AND AFFECTIVE MECHANISMS BEHIND NOCEBO RESPONSE

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Background and aims: *Pain anticipation* may be considered as a way to elicit and study *nocebo response*. Interestingly, only one study described cortical-subcortical circuitries related to it (Kong et al., 2008). Conversely, pain anticipation has been investigated in a variety of brain imaging studies but today there is no clear overall picture of the areas that are involved in it. Moreover the role of these regions in pain expectation remains unexploited.

Methods: *ALE meta-analysis* was implemented in a total of 19 functional MRI studies in order to search for the cortical areas involved in pain anticipation in human experimental models. *MACM analysis* explored the brain-wide functional connectivity pattern of given ALE-brain-regions and brain responses triggered by the anticipation of a noxious stimulus.

Results: Activated foci were found especially in the dorsolateral and medial prefrontal cortices, with AI and ACC clusters playing a key role. MACM results provide an overall view of the brain responses triggered by the anticipation of a noxious stimulus and involving information processing where *action* [imagination, inhibition, execution], *emotion* [fear] and *perception* [pain, interoception] play a central role.

Conclusions: These findings provide information on the neural events when anticipating pain, and they also may give a perspective into *nocebo*, whereby negative expectations may lead to pain worsening. Our results emphasize the need for a psychological approach to predict potentially noxious events: a flow of expectation-related information may be crucial for the development of the highly distributed perceptual set of self-regulation observed in pain expectation conditions.

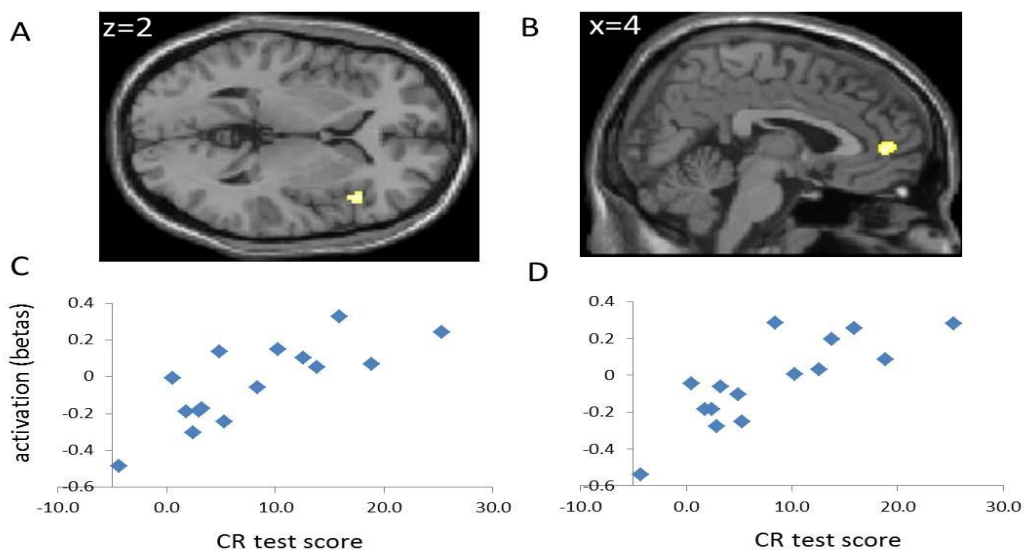
PREFRONTAL ACTIVATION DURING PLACEBO ANALGESIA IS RELATED TO COGNITIVE REAPPRAISAL*M. van der Meulen¹, F. Anton¹**¹psychology, University of Luxembourg, Luxembourg, Luxembourg***Background and aims**

Converging evidence from neuroimaging studies shows that placebo analgesia (PA) is driven by activation in several prefrontal cortex (PFC) regions, occurring during and in anticipation of pain (Wager & Fields, 2014). Despite the obvious involvement of the PFC, there is no convincing theory for its functional role, having been ascribed vaguely to holding expectations or cognitive control mechanisms (Wager et al., 2004; Tracey, 2010). We propose that the PFC regions recruited during PA are involved in cognitive reappraisal (CR) – reinterpretation of the meaning or affective content – of pain. Like PA, CR is driven by PFC activation, which in turn inhibits limbic systems, thereby suppressing the experience of negative affect (Ochsner & Gross, 2008).

Methods: To study the possible functional relationship between CR and PA, we conducted an fMRI study to measure PFC activation during PA. In a separate experimental session, participants underwent a test for CR of negative pictures (McRae et al., 2012). So far, data from 15 participants were analysed.

Results: Preliminary results demonstrate significant positive correlations in two PFC regions (right ventrolateral and ventromedial) between activation related to PA and performance on the independent CR task (see figure).

Conclusions: CR may be a major underlying psychological mechanism of PA. Receiving a placebo may lead to PFC driven reinterpretation of pain, which directly influences the somatosensory and affective components of pain perception. Both PFC regions have been implicated in CR studies, and are hypothesised to be involved in evaluating self-relevance and attentional control (Ochsner & Gross, 2008; Kalisch et al., 2005).



PSYCHOLOGICAL FACTORS INFLUENCING PLACEBO RESPONSES – THE BENEFIT OF EXPECTATIONS AND THE DESIRE OF SYMPTOM RELIEF IN ITCH PROCESSES

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Background and aims: Placebo mechanisms in pain are well understood. Cognitive factors such as emotions, motivations and the ‘desire’ for symptom relief as a specific characteristic of patients have a profound impact on pain sensations (Klinger & Flor, 2014; Klinger, Soost, Flor & Worm, 2007). Due to substantial similarities between pain and pruritus with regard to their mode of action (Ständer & Schmelz, 2006), it seems reasonable to transfer the analgesic placebo model to the concept of itching and to evaluate specific psychological factors influencing placebo responses.

Methods: In a single-blind, randomised, controlled study 78 patients with atopic dermatitis were assigned to 2 different openly administered treatments (Dimetinden Maleat) and one placebo/conditioning treatment. The effect of the treatment on the dependent variable itch sensation reduction was determined at 2 points. The focus rested on the influence of cognitive factors (desire and expectation).

Results: The results indicate the strong relationship between patient’s desire of itch relief and the actual itch sensation reduction ($r=-.44$, $p<.01$). Furthermore, the data show that all treatment groups had a significant itch reduction over time and that the expected itch relief level of the patients (high vs. low) is linked to decreased itch sensations ($p=.64$, $p<.001$).

Conclusions: Positively influencing emotions, thoughts and motivations are benefits for establishing and maintaining placebo responses. Especially, the desire of symptom reduction is strongly related to the patient’s confidence in treatment.

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EFIC5-0557

Human behavioural science: Placebo and expectation

A VIRTUAL EXPERIMENTER AS MEANS TO OVERCOME BIASES IN BEHAVIORAL PAIN RESEARCH

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Background and aims: Behavioral pain research can be severely affected by systematic biases. This issue is exacerbated if the experiment includes a high degree of experimenter-participant interaction, and countermeasures such as blinding or standardization are compromised. Under these conditions, a computer-generated Virtual Experimenter (VEx) could be employed to facilitate internal validity. **Methods:** Using a heat pain protocol (hand immersion in 47°C hot water bath), a VEx is employed to demonstrate its comparability to a human experimenter in inducing expectancy effects through a placebo intervention (i.e. pain reduction without active medication). The VEx exhibits human characteristics and behaviors and is presented in an immersive virtual environment. **Results:** The experimental paradigm is currently being piloted. The pain protocol exhibits high retest reliability (intraclass correlation $\rho=0.82$). The VEx presentation (placebo instruction) scores high on constructs relevant for placebo responding. For example, on an 11-point Likert scale (0-10), it was rated 8.75 competent, 9 likeable, 8.75 trustworthy, 7.75 convincing. **Conclusion:** Preliminary results indicate that a VEx is a feasible means to induce expectancy/placebo effects in a heat pain protocol. By improving the reliability of trials, it would reduce biases and error variance, thereby increasing the ability of experimental or clinical trials to detect treatment effects. As a software program, it could be distributed and customized easily, and would especially benefit multi-center trials or training endeavors. It could afford lifelike interaction for imaging paradigms. Lastly, the VEx could provide a convenient platform to investigate effects of experimenter characteristics (e.g., sex, age, race/ethnicity).

ALTERED SOMATOSENSORY PERCEPTION IN AN UNPREDICTABLE PAIN CONTEXT.

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Background and aims: Many clinical chronic pain conditions are characterized by high levels of pain unpredictability. Although the influence of pain-related expectations on pain perception has been well described; little is known about the components of the perceptual decision making process that are affected by unpredictability.

Methods: The effect of pain (un)predictability on the perception of somatosensory electrocutaneous sensations was investigated. We used a paradigm in which various stretch-movements were associated with either predictable pain, unpredictable pain or the absence of pain. Pain was induced using an electrocutaneous current stimulator. While executing the movements, two electrocutaneous stimuli near the pain threshold were presented, one of high and one of low intensity. Participants were requested to categorize these stimuli using a forced choice paradigm. Hierarchical Drift-Diffusion modelling was employed to investigate the influence of pain (un)predictability on perceptual decision-making.

Results: Movements associated with predictable or unpredictable pain were perceived as more unpleasant and led to higher self-reported fear compared to safe movements. In the unpredictable context, the perceptual system became more stringent (i.e., wider boundary separations) compared to the predictable pain and the no pain context. Furthermore, unpredictable pain induced a prior shift in the perceptual system towards the 'high' intensity boundary, whereas a safe context induced a prior shift towards the 'low' intensity boundary.

Conclusions: Exposure to an unpredictable pain context biased the perceptual system towards high intensity stimuli, whereas a safe context induced a prior bias to low intensity movement-related sensations.

EFIC5-0637

Human behavioural science: Placebo and expectation

PLACEBO ANALGESIA ACROSS THE LIFESPAN

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Background and Aims

Placebo analgesia is a prime example for cognitive pain modulation. Neurobiologically, the descending pain inhibitory system plays an important part in the pain relieving effect. High prevalence of chronic pain in the older population suggests that the endogenous pain modulation changes over the years. To investigate these potential differences across the lifespan, we examined the placebo analgesic response between healthy adults and elderly participants on behavioral and neuronal level.

Material and Methods

This fMRI study included 54 healthy participants from two age groups [30 adults (M=27), 24 elderly (M=69)]. The placebo analgesic response was elicited by an established heat pain placebo paradigm involving conditioning and expectation inside the MR scanner.

Results

Older participants exhibited a higher pain threshold compared to adults. A significant placebo response was elicited in both groups. Elderly participants showed higher pain ratings despite identical temperature stimulation. No difference was observed in the placebo analgesic response between the two groups. fMRI results will be presented at the poster.

Discussion

Although older participants exhibited higher pain thresholds, pain ratings were increased compared to adults, suggesting a higher pain sensitivity in the elderly. A lack of differences in the placebo analgesic response between the two groups indicates a functional cognitive triggered endogenous pain modulation in the older participants. These findings emphasize that cognitively triggered endogenous pain modulation seems to be a valuable resource which is available across the lifespan.

THE INFLUENCE OF MEDICATION VALUE ON THE NOCEBO EFFECT AND ITS UNDERLYING PAIN NETWORK ACTIVITY

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The nocebo effect is characterized by an increase in pain perception after the administration of an inert treatment. In this study, we investigated the influence of a medication's price (cheap vs. expensive) on the magnitude of the nocebo response.

57 subjects (28 females) underwent a heat pain stimulation protocol with a Peltier element on the left forearm while BOLD responses were recorded with an MR scanner. The nocebo treatment was introduced as a medical cream that increases pain sensitivity as a negative side effect and was compared to a control cream. Subjects were randomly assigned to one of two groups, one receiving a cheap medical cream whereas the other group tested an expensive cream. Subjects received 36 heat stimuli (18 control/18 nocebo) with durations of 20 seconds each and individual pain ratings were recorded after every trial.

Pain ratings in the nocebo condition were significantly higher ($t = 3.11$, $p < 0.01$) compared to the control condition. The interaction between the cheap and the expensive nocebo cream was significant ($t = -2.6$, $p < 0.05$), indicating that the nocebo effect was increased in the expensive condition whereas in the cheap condition, the nocebo effect was absent. Neural correlates of the nocebo effect were found in the left insula, the striatum and bilateral hippocampus. The comparison of the expensive and the cheap group revealed increased activations in the left insula, left anterior cingulate cortex and bilateral hippocampus.

This study shows that medication value increases the nocebo response and modulates brain activity in pain network areas.

EFIC5-0633

Pain treatment (invasive): Radiofrequency blocks

TRANSCUTANEOUS RADIOFREQUENCY : A NOVEL EXPERIENCE

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The pulsed through transcutaneous electrode radiofrequency (TCPRFT) was described previously in the literature in a range of anatomic sites,

A retrospective study of 14 patients was performed during the period 2014 10 diagnosed with knee pathology and 4 chronic shoulder pathology.

We included in our study those patients referred for specialist diagnosed osteoarticular pathology (shoulder and knee) for more than three months duration after entering your conventional therapies performed ineffectively after handling conventional, including steroid injections, hyaluronic acid or ozone,

discarded for surgery.

The TCPRFT was performed with a radio frequency generator 1100 using Neurotherm NT modified leads, connected to two channels in a surface mounted TENS adhesive, and managed not termoacoplado mode with manual voltage.

Treatment was done always in the same position, with two parameters pps, 20 msec, 90V, for 12 minutes.

Study of 14 patients aged 45-75 (mean 68.9 years), 10 women and 4 men is performed.

The temporal evolution of the disease in the patients was 2.2 years.

In relation to the initial VAS was 88.6 on average, reducing to 42.6 after month, $p < 0.01$; in half of the patients the pain more than 50% was reduced in 65.3% of patients pain by 30% in the first month period. In relation to the physical activity of the patient is reduced, increased activity occurs 20.5 / 44 23 0.6 / 44 once the technical as well as non-significant increase in secondary social activities and mood, because shortly after evaluation of improvement, a month.

EFIC5-0937

Pain treatment (invasive): Radiofrequency blocks

EFFICACY OF RADIO FREQUENCY NERVE ABLATION (RFNA) IN TRIGEMINAL NEURALGIA AND ITS COMPARISON WITH INJECTION TRIAMCINOLONE! A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Trigeminal Neuralgia (TN) is a neuropathic pain condition affecting the face. It has a significant impact on the quality of life and physical function of patients. **OBJECTIVES:** To evaluate the efficacy and safety of radio frequency in patients suffering from TN. **SUBJECTS AND INTERVENTIONS:** Patients were randomly separated into two groups one receiving Radio Frequency (A) group (n=60) and the other control (B) group (n=56) matched by age and severity of symptoms. The group A received thermal radio frequency ablations of the affected branches followed by Injection Triamcinolone. The patients in group B were given Injection Triamcinolone. **RESULTS:** The average pain score in patients who received radio frequency was 7.65 ± 0.91 before treatment, whereas after treatment it was 2.31 ± 0.98 . The mean pain score in patients who were given injection triamcinolone before starting the treatment was 7.47 ± 0.71 and after treatment, it was 6.23 ± 0.98 . The mean score for daily life activities in subjects who received radio frequency was 9.56 ± 2.37 before treatment, while after treatment it was 7.56 ± 1.54 . The average score for daily life activities in patients who were given injection triamcinolone before starting the treatment was 9.05 ± 1.93 and after treatment, it was 8.11 ± 1.71 . Average depression and anxiety score in patients receiving radio frequency was 9.29 ± 2.28 before treatment, whereas after treatment it was found to be 7.42 ± 1.91 . **CONCLUSION:** The mean scores in our study reveal that radio frequency shows much better outcomes in improvement of pain relief, depression, anxiety and daily life activities compared to injection triamcinolone in patients suffering from trigeminal neuralgia.

EFIC5-0947

Pain treatment (invasive): Radiofrequency blocks

EPIDURAL PULSED RADIOFREQUENCY (EPRF) STIMULATION FOR THE TREATMENT OF PAIN SYNDROMES - A RETROSPECTIVE ANALYSIS

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In 2003, the called multifunctional electrode®, a steerable, flexible electrode, which delivers the PRF pulses parallel to the medullary fibers or nerval axons epi- durally (ePRF), has been introduced first in Germany. Furthermore, the catheter enables the injection of medications or agents into the epidural space instead of, or in combination with, the electrical current.

There remains a strong discrepancy between the widespread use of the ePRF® on one hand, and a significant lack of systematic studies on the other hand.

The aim of our retrospective study was, to analyze the application and the use of ePRF in our centers with regard to which pain indications were treated, how the ePRF method was applied, and to estimate the efficacy and the risk profile of the treatment. Especially, we wanted to focus on the amount of the therapeutic effect, which is only due to the electrical impulse, alone. We also wanted to work out the patients satisfaction with ePRF treatment and therefore we wanted to look beyond the simple VAS scores.

This study was a multicenter retrospective review of consecutive patients treated with ePRF using the multifunctional electrode® at the Centre Hospitalier Luxem- burg (CHL), Luxemburg; the Orthopädische Klinik (OS), Schwerte, Germany; and the Interdisziplinäres Wirbelsaeulenzentrum, Bonn (IWIZ), Germany.

EFIC5-0948

Pain treatment (invasive): Radiofrequency blocks

PATIENT SATISFACTION SURVEY FOR PATIENTS HAVING LUMBAR FACET MEDICAL BRANCH RADIOFREQUENCY DENERVATION (RFD) IN SPECIALIST PAIN MANAGEMENT CENTRE.

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Background and aims

RFD of the lumbar medial branch is a common procedure for the treatment of facetogenic low back pain. However, patients' experience with RFD has not been examined thoroughly. Our objective was to evaluate patient satisfaction with our RFD service.

Methods

After departmental approval and informed consent, 105 questionnaires were posted to patients eight weeks after lumbar RFD. Patients rated their experience scoring change in pain intensity, ability to carry out day-to-day activity, distress due to pain, percentage of pain relief achieved, and overall value to their care.

Results

Data was collected from 70 patients between January and June 2014. 59% of patients rated pain intensity as improved or much improved. 56.5% of patients stated pain reduction between 30% and 100%, and 30.5% had 50% or more pain relief. 37% of patients rated their day-to-day activity as improved and 48.5% remained the same. 44.5% of patients rated their level of distress due to pain as improved, with 37% no change. 71.5% of patients rated the value of RFD as quite or extremely helpful for their care overall.

Conclusion

Our study showed that patient satisfaction with RFD was high and most patients had pain improvement. However, reduction of pain may not be matched by reduction of distress or improvement of day-to-day activity. Additional interventions such as physiotherapy and multidisciplinary pain management programme, which can be offered in tandem with the RFD procedure, may further optimise RFD outcomes.

EFIC5-0991

Pain treatment (invasive): Radiofrequency blocks

THE EFFECT OF GENICULAR RADIOFREQUENCY ON OSTEOARTHRITIC KNEE PAIN

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Background and aims: Chronic knee osteoarthritis(OA) is the deterioration of articular cartilage and one of the most common diseases of advanced age. OA pain of knee is often not effectively managed with pharmacological or non-surgical treatments. The knee joint is innervated by the articular branches of various nerves, including the femoral, common peroneal, saphenous, tibial, and obturator nerves. These branches around the knee joint are known as genicular nerves. RF neurotomy applied to genicular nerves is new and effective method on chronic OA knee joint pain.

Methods: 15 elderly patients with severe knee OA pain lasting more than 6 months and no response to conservative treatments were planned to percutaneous RF genicularneurotomy. Conventional Radiofrequency lesions of superior medial, superior lateral and inferior medial genicular nerves supply pain signals back to the central nervous system, were performed under fluoroscopic guidance. Assessment of pain by Visual analogue scale (VAS), WOMAC score for knee functionand SF 36 health survey scoring were documented pre and post PRF at 6, 12 and 24 weeks.

Results: There was significant pain reduction, functional improvementand treatment satisfaction observed in patients. There was no post-precEDURE adverse event during the follow-up period.

Conclusions: Genicular RF seems to be a safe, effective, and minimally invasive therapeutic procedure for chronic knee OA patients. Further trials with larger sample size and longer follow-up are warranted.

EFIC5-1035

Pain treatment (invasive): Radiofrequency blocks

INTRACTABLE LESSER OCCIPITAL NEURALGIA TREATED WITH PULSED RADIOFREQUENCY

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Background and Aim

Lesser occipital nerve (LON) is less frequently involved in occipital neuralgia. We aimed to present a case with intractable LON neuralgia treated with pulsed radiofrequency (PRF).

Case

Thirty five years old male patient, with unilateral paroxysmal, shooting pain in the posterior part of the scalp, in the LON distribution area for 2 years is presented. He has tenderness over the LON and pain is amplified with pressure over the LON. Blood sample analysis and cervical and cranial MRI was normal. During 2 years he used different medical treatments; Carbamazepine, gabapentin and amitriptyline. Patient reported inadequate pain relief with intolerable side effects with all medical agents. Patient was admitted with 30-40 attacks per day with VAS 7-8 pain severity. After diagnostic block of LON with 2 ml 0.25% bupivacaine and triamcinolone 40 mg the frequency and severity of pain was reduced. After 2 weeks LON PRF was applied with 10 minute duration. After a month patient has VAS 7 severity, 1-2/per week pain. LON block with 2 ml 0.25% bupivacaine and triamcinolone was repeated. In second month he has VAS 2-3 severity, 1-2attack/per week pain. For last 6 month he has not severe pain. The patient follow-up is continued.

Conclusion

In patient with intractable occipital neuralgia involved LON, pulsed radiofrequency provided effective and long term pain control. PRF is safe and can be used alone or addition to medical treatment in pain control.

**COMPLICATION FOLLOWING LUMBAR FACET JOINT RADIOFREQUENCY
DENERVATION.**

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Background & aim: A 46 year old lady came in with chronic lower back pain. Previously underwent diagnostic bilateral lumbar medial branch blocks with chirocaine and depomedron to which patient responded well, subsequently came for radiofrequency denervation of lower lumbar facet joints. The aim of this procedure was to relieve chronic lower back pain. Methods: Procedure was done in the day surgery unit under local anaesthetic. Patient in prone position, aseptic precautions were taken. Fluoroscopy, contrast dye, sensory and motor testing guidance was used to perform percutaneous radiofrequency denervation of the lower lumbar facet joints. Procedure effects, side effects and complications were explained and written consent was obtained. Results: Patient recovered from the procedure well with good pain relief on the right side but developed sensory loss and motor weakness in the left lower leg. Initially as there was persistent numbness and weakness in the left leg which was nonspecific the patient was admitted and subsequently investigated with MRI of spine to rule out haematoma and nerve conduction studies were also performed at the regional pain centre. All of which did not reveal any abnormalities. Conclusions: Patient was understandably anxious and was regularly reviewed and reassured by the pain team and neurologist. The case was discussed at the Pain management MDT. Physiotherapy was offered and this improved the symptoms to some extent. Literature search: 1. Kormick C, Kramarich SS, Lamer TJ, Todd Sitzman B _ Complications of lumbar facet radiofrequency denervation was published in Pubmed 2004, June. 2. Complication rate associated with facet joint radiofrequency denervation procedures – DOI 10.1046/j.1526-4637, 2002, Pain medicine Volume 3 issue 2, June 2002.

COMPARISON OF PERCUTANEOUS BALLOON COMPRESSION AND RADIO FREQUENCY ABLATION FOR THE TREATMENT OF TRIGEMINAL NEURALGIA.

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Background & Aim:

The aim of the present study was to compare percutaneous balloon compression (PBC) and radio frequency ablation (RFA) for the treatment of trigeminal neuralgia with respect to the effectiveness of pain relief, technical aspects and complications.

Material and Methods:

In this combined prospective-retrospective study, 47 consecutive PBC procedures were performed in 44 patients between May 2012 and February 2015, and 94 RFA attempts were performed in 87 patients during the same period. The procedures were not completed due to technical reasons in 2 cases for the PBC and 3 cases for RFA. Follow-up was completed with telephone contact, when necessary. The 2 groups were compared in terms of relief percentage, duration and complications, if any were recorded and compared.

RESULTS:

The initial pain relief as well as the duration was significantly higher in the PBC group than the RFA group ($P < 0.05$). Masseter weakness had a higher incidence in the PBC group but rest of the complication rates were higher in the PRA group. Combined difference in complications was statistically significant ($P < 0.05$).

CONCLUSIONS:

Both PBC and PRA are effective techniques for the treatment of trigeminal neuralgia, but PBC offers some advantages in terms of fewer complications as well as effectiveness in treating refractory cases. Due to the longer lasting relief, it may be considered the first line treatment for patients presenting with trigeminal neuralgia and maybe the only percutaneous option available for V1 division affected patients.

THE ROLE OF PERCEIVED INJUSTICE IN EXPLAINING AFFECTIVE DISTRESS AND DISABILITY IN CHRONIC PAIN PATIENTS

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Background and aims: Pain-related injustice - conceptualized as an appraisal reflecting the severity and irreparability of pain/ injury related loss, externalized blame, and unfairness - has been shown to contribute to disability and suffering in patients with chronic pain. This study investigates to what extent perceived injustice has a unique contribution in explaining disability and affective distress in chronic pain patients.

Methods: 44 out of 46 consecutive patients with chronic pain filled out a battery of questionnaires as part of a psychosocial assessment in a Multidisciplinary Pain Center. The battery included, amongst others, the Injustice Experience Questionnaire (IEQ) which consists of two subscales: Blame/Unfairness and Severity/Irreparability, the Pain Disability Index (Disability), the Multidimensional Pain Inventory (pain severity), and the Depression, Anxiety and Stress Scales (DASS).

Results: Both IEQ subscales were significantly related to pain severity, disability, depression, anxiety and stress, except for the blame IEQ subscale with disability ($r=.26$, ns). Multiple regression analyses investigated the unique contribution of the IEQ subscales in accounting for disability and affective outcomes, beyond gender, age and pain severity. The IEQ subscales did not uniquely account for disability, but did for Depression (DASS, $F_{\text{change}}(2,40)=11.47, p<.001$, $R^2_{\text{change}}=0.279$), Anxiety (DASS, $F_{\text{change}}(2,40)=4.349, p<.05$, $R^2_{\text{change}}=0.152$) and Stress (DASS, $F_{\text{change}}(2,40)=3.576, p<.05$, $R^2_{\text{change}}=0.131$).

Conclusions: Feelings of injustice about pain and disability have a consistent effect upon affective outcomes but not on disability. As such, current findings suggest that targeting perceived injustice in therapeutic interventions may increase emotional wellbeing in chronic pain patients.

COST-UTILITY OF COGNITIVE BEHAVIOURAL THERAPY IN THE TREATMENT OF PATIENTS WITH FIBROMYALGIA SYNDROME: RESULTS FROM A 6-MONTH RANDOMISED CONTROLLED TRIAL

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Background and aims. Cognitive behavioural therapy (CBT) and U.S. Food and Drug Administration (FDA) recommended pharmacological treatments (RPT; pregabalin, duloxetine, and milnacipran) are effective treatments for fibromyalgia syndrome (FMS). In this study, we compared the cost-utility from the healthcare and societal perspectives of group CBT versus RPT (pregabalin + duloxetine) and usual care (TAU) in the treatment of FMS.

Methods. Six-month, multicentre, randomised, controlled trial. A total of 168 FMS patients from 41 general practices in Zaragoza (Spain) were randomised to CBT (n= 57), RPT (n= 56) or TAU (n= 55). The main outcome measures were Quality-Adjusted Life Years (QALYs; EQ-5D) and improvements in health-related quality of life (HRQoL; EQ-VAS). The costs of healthcare utilisation were estimated from patient self-reports (CSRI). Cost-utility was assessed using the net-benefit approach and cost-effectiveness acceptability curves (CEACs).

Results. From a complete case analysis approach, the point estimates of the cost-effectiveness ratios resulted in dominance for the CBT group in all of the comparisons performed, using both QALYs and EQ-VAS as outcomes. These findings were confirmed by bootstrap analyses, net-benefit curves and CEACs. Two additional sensitivity analyses (intention-to-treat analysis and per-protocol analysis) confirmed these results. The comparison of RPT versus TAU yielded no clear preference for either treatment when using QALYs, although RPT was more cost-effective than TAU when evaluating EQ-VAS.

Conclusions. CBT is the most cost-effective treatment for adult FMS patients. However, its implementation in routine medical care would require widespread public access to trained and experienced therapists in group-based forms of CBT.

EFIC5-0282

Pain treatment (psychological):Cognitive-behavioural treatment

INFLUENCE OF PSYCHOLOGICAL FACTORS ON INTENSITY OF PAIN IN PATIENTS WITH CHRONIC PAIN

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Background and aims

Pain leads negative emotions such as anxiety and depression. Conversely, these negative emotions can easily modify pain. Patients who have negative thinking tend to suffer from chronic pain, which is difficult to cure. The goal of this study is to clarify the influence of these psychological factors on intensity of pain in patients with chronic pain.

Methods

Hospital Anxiety and Depression Scale (HADS) and Pain Catastrophizing Scale (PCS) were examined in 187 new patients with chronic pain who visited Kyushu University Hospital outpatient department of pain clinic from February to October in 2014. We measured maximal and minimal Numerical Rating Scale (NRS) to evaluate intensity of pain at its worst and least. We calculated correlation coefficients between NRS and these psychological indexes by linear regression analysis.

Results

Maximal NRS (NRSmax) had weak correlations with anxiety ($r=0.33$) and depression ($r=0.32$). On the other hand, NRSmax had moderate correlation with PCS ($r=0.55$). Minimal NRS (NRSmin) had weak correlations with anxiety ($r=0.26$), depression ($r=0.26$) and PCS ($r=0.38$).

Conclusions

These results demonstrate that patients with chronic pain who complain of strong pain tend to have high pain catastrophizing scores and thus seem to need psychotherapy such as cognitive behavior therapy. It may also be suggested that NRS represents intensity of pain not only physically but also psychologically.

EFIC5-0419

Pain treatment (psychological):Cognitive-behavioural treatment

COGNITIVE PATIENT EDUCATION FOR LOW BACK PAIN IN PRIMARY CARE: A CLUSTER RANDOMISED CONTROLLED TRIAL AND COST-EFFECTIVENESS ANALYSIS

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Purpose: To estimate the clinical effectiveness of a cognitive education program provided by general practitioners (GP) and physiotherapists (PT) in addition to usual treatment, and to estimate cost- effectiveness over a period of 12 months.

Methods: 20 GPs and 20 PTs in a Norwegian primary care were randomly assigned by computer-generated block randomisation to either provide cognitive patient education in addition to usual treatment or usual treatment only. Consecutive consulting patients with non-specific subacute/chronic low back pain, 20 to 55 years, were recruited. The patients, outcome assessors, and study statistician were blinded to group allocation. Primary outcome was the Roland Morris Disability Questionnaire (RMDQ). Secondary outcome were pain, work loss and cost-effectiveness.

Results: 6 GPs and 9 PTs provided the cognitive intervention for respectively 46 and 63 patients, whereas 6 GPs and 10 PTs treated respectively 24 and 85 patients as usual. A total of 216 patients reported baseline data, 174 responded at 4-weeks (80.6%) and 147 on the 12 months follow-up (68.1%). There was a substantial improvement in RMDQ in both treatment groups during follow-up. The mean difference for the follow-up year was -0.45 (CI -1.67 to 0.77) with no statistical significant differences between the groups. The PT patients scored significantly lower than GP patients with an overall estimate of -1.68 (-2.6 to -0.7). A similar pattern was found for the secondary outcomes and the cost-effectiveness analysis.

Conclusion: This trial showed no clinical or health economic benefit of adding a cognitive patient education programme to usual treatment for LBP.

EFIC5-0540

Pain treatment (psychological):Cognitive-behavioural treatment

EFFECT OF MENTAL ADJUSTMENT TO CANCER ON PATIENTS' QUALITY OF LIFE AND PERCEIVED PAIN

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Background and aims

The aim of the study was to evaluate the influence of negative and positive cancer-coping strategies on pain perception, the levels of patients' functioning and perceived quality of life (QoL).

Methods

The survey included 182 patients suffering from hard to control cancer symptoms, treated in various clinics in the Institute of Oncology in Warsaw. Patients' functioning and QoL was measured using Quality of Life Questionnaire (QLQ-C30). Pain (current, average and maximum in the last week) was measured by Visual-Analogue Scale (VAS). Disease coping strategies were measured using shortened Mental Adjustment to Cancer Scale (Mini-MAC). 100 complete questionnaires were obtained from 48 women and 52 men (mean age 56 years). The differences between the groups with a predominance of constructive and destructive strategies were statistically analyzed using Student's T-Test with Cochran-Cox correction.

Results

Patients with a predominance of constructive strategies had significantly higher values in all functional scales and QoL.

Patients with a predominance of destructive strategies reported higher values for maximum level of pain. No statistically significant differences between the groups in terms of the average and current pain were found.

Conclusion

In conjunction with the daily clinical observation the study indicates that the therapeutic influence leading the patient to adopt a constructive strategy leads to better functioning and QoL. Also the results show that the lack of good pain control prevents implementation of constructive strategies.

Good symptoms' control is a prerequisite for a high QoL, but does not guarantee it.

EFIC5-0555

Pain treatment (psychological):Cognitive-behavioural treatment

NOVEL THREE-DAY COMMUNITY-BASED, NON-PHARMACOLOGICAL, GROUP INTERVENTION FOR CHRONIC MUSCULOSKELETAL PAIN (COPERS): A RANDOMIZED CLINICAL TRIAL

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Background: Psychological interventions for chronic pain may have clinical and economic advantages compared to drug treatments. We aimed to test the effectiveness and cost-effectiveness of a group, pain self-management intervention (COPERS) for patients with chronic musculoskeletal pain.

Methods: COPERS was delivered over three days with a top-up after two weeks it was based on cognitive behaviour principles and delivered by a healthcare professional and a lay-person. We conducted a pragmatic randomised controlled trial. Control participants received usual care, an education booklet and relaxation CD. We collected follow-up data at six and 12 months. Our primary outcome was pain-related disability (Chronic Pain Grade, CPG, subscale) at 12 months, we measured: costs, health utility (EQ-5D), anxiety, depression (Hospital Anxiety and Depression Scale, HADS), coping, pain acceptance and social integration.

Results: We recruited 703 participants, mean age 59.9 years, 81% white, 67% female. At 12 months there was no significant difference between groups in CPG disability (difference -1.0, intervention vs. control, 95% CI -4.9 to 3.0). However self-efficacy, anxiety, depression, pain acceptance and social integration were significantly better in the intervention group at six months; these differences remained significant at 12 months for depression and social integration. COPERS has a high probability (87%) of being cost-effective.

Conclusions: COPERS improved psychological well being and is likely to be cost effective but failed to influence our primary outcome. In the absence of more effective group self-management interventions, COPERS could be used as a substitute for less well evidenced (and more expensive) pain management programmes.

COGNITIVE BEHAVIORAL TREATMENT IN PATIENTS WITH CHRONIC LOW BACK PAIN IN A PUBLIC HEALTH SETTING

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Background and aims: chronic low back pain (CLBP) is a syndrome characterized by musculoskeletal pain in the final segment of the spine (Casado-Morales, Moix-Queraltó and Vidal-Fernández, 2008). It is one of the most common chronic pain conditions given its prevalence, 7.7% (Humbría-Mendiola, Carmona, Peña-Sagredo and Ortiz, 2002). In addition to limitations in mobility (Indahl, 2004), CLBP has a negative impact on psychological well-being, provoking depression in 29% of patients (Mok and Lee, 2008). Psychological treatment has demonstrated to be effective in the improvement of quality of life of CLBP sufferers, especially applying Cognitive Behavioral Therapy (CBT) (Hoffman et al., 2007). The aim of this study is to describe a CBT protocol and present a case series of patients who already has been applied such treatment. **Method:** 5 people with CLBP from the rehabilitation area of a public health hospital in Spain received 6 sessions of CBT, once a week, around 2 hours duration. The therapeutic components of this treatment were psychoeducation, mindfulness, cognitive restructuring, programming activities, relaxation and relapse prevention. We evaluated patients at pre-test, post-test and at 3 and 6 months follow-up. **Results:** a decrease of outcome measures (pain and disability) is observed after treatment. **Conclusions:** This preliminary results indicate that it is possible to implement CBT in a public setting. **Acknowledgements:** this work is part of PI12 / 02710 project funded by the Instituto de Salud Carlos III (Ministry of Economy and Finance).

EFIC5-0749

Pain treatment (psychological):Cognitive-behavioural treatment

METACOGNITIONS ARE ASSOCIATED WITH SUBJECTIVE MEMORY PROBLEMS IN PATIENTS WITH CHRONIC PAIN AND FATIGUE

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Background: Subjective memory complaints are frequent in patients with pain and fatigue, but poorly understood. Both symptom perceptions and memory complaints likely involves top-down control of attention. The S-REF model shows how metacognitive beliefs could be involved in the top-down control of attention. The main aim of this study is to investigate the prevalence of subjective memory complaints in participants reporting pain and fatigue, and see whether these complaints are associated with dysfunctional metacognitions.

Methods: A total 140 patients receiving 3.5 weeks RTW-rehabilitation for pain and/or fatigue were included. Participants' filled out a survey asking about socio-demographics, somatic and psychological complaints and metacognitions pre to post treatment. They were also examined and diagnosed for mental disorders according to DSM-IV criteria at a designated outpatient clinic.

Results: At post-treatment, participants reported an improvement in fatigue ($p<.001$; $g=1.08$), but not on pain intensity. Symptoms of fatigue ($p<.0001$) and negative metacognitive beliefs ($p<.0001$) were associated with more subjective memory complaints at treatment start. A reduction in fatigue ($p=0.04$) and negative metacognitive beliefs ($p<.0001$) were associated with less subjective memory complaints at treatment end.

Conclusion: In participants reporting pain, fatigue and subjective memory complaints, a reduction in negative metacognitive beliefs reduced their memory complaints. Metacognitive beliefs could be a potent, understudied mediator of memory complaints in pain conditions.

EFIC5-0818

Pain treatment (psychological):Cognitive-behavioural treatment

A RANDOMIZED CONTROLLED MULTICENTRE TRIAL COMPARING A BRIEF INTERVENTION WITH ADDITIONAL CBT, SEAL OIL, AND SOY OIL FOR SICK-LISTED LOW BACK PAIN PATIENTS

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Background and Aims:

Brief intervention (BI) programs are beneficial and cost efficient treatments for low back pain (LBP). The aim of the study was to assess additional benefits of CBT or seal oil over BI on return to work (RTW).

Methods: 409 adults, sick listed 2-10 months due to LBP, were included and randomly assigned to BI (n=100), BI+CBT (n=101), BI+seal oil (n=103), or BI+soy oil (n=105). The CBT involved 7 sessions, while the nutritional supplements consisted of 20 capsules of seal or soy oil per day for 3 months.

Results: At 12 months follow-up, 90% of the participants in the BI group, 83% in the BI+CBT group, 84% in the BI+seal oil group, and 89% in the BI+soy oil group showed increased RTW from baseline. The differences between the groups were not statistically significant. There were no significant differences between the treatment groups at any of the other follow-ups either, except for a significantly lower RTW rate in the BI+seal oil group the first 5 months of follow-up. Improvement of disability and health complaints did not differ significantly between the groups at 3, 6 or 12-months follow-up, except for the BI+CBT group, who reported less gastrointestinal complaints at 6 months and lower pain intensity at 12 months.

Conclusions: CBT and seal oil had no additional benefits over a brief cognitive intervention on RTW, and no additional benefits on health complaints and disability, except for a possible small effect of the CBT on pain intensity and gastrointestinal complaints.

EFIC5-0901

Pain treatment (psychological):Cognitive-behavioural treatment

TELEPHONE CONSULTATION PARTIALLY BASED ON A COGNITIVE-BEHAVIORAL APPROACH TO THE INTENSITY OF PAIN AND QUALITY OF LIFE IN CHRONIC PAIN PATIENTS

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Background and aims

Chronic pain can lead to decreased routine activity, occasionally causes withdrawal from society and otherwise disrupts daily activities. In such cases, a multifaceted, collaborative (multidisciplinary) intervention is needed. The aim of this was to investigate the effect of a telephone consultation approach partially based on a cognitive-behavioral approach to chronic pain.

Methods

This retrospective analysis was performed on people suffering from chronic pain and their family who called the nonprofit organization to seek consultation about the management of their pain. Telephonic consultation was delivered by nurse care managers. They informed the participants how to correct or eliminate excessive fear of pain, improper thinking for treating pain and anxiety caused by distorted cognition as well as how to control activity levels by appropriate pacing. We measured the intensity of pain rated by 132 participants using a numerical rating scale (NRS) where 0 indicated no pain and 10 the greatest pain possible. Furthermore, quality of life (QOL) were rated by feeling, depending on the state 6 to 12 months after the initial call.

Results

The median (range) was 8(2-10) of Pre NRS and 5(0-10) of Post NRS. QOL improvement was categorized as follows: 8.3 % with marked improvement, 37.8 % with some improvement, 37.1 % with no improvement, and 15.9 % with deterioration.

Conclusions

Telephone consultation partially based on a cognitive-behavioral approach significantly reduced the intensity of pain in chronic pain patients. Furthermore, more than half of them felt an improvement in QOL.

EFIC5-0915

Pain treatment (psychological):Cognitive-behavioural treatment

EVIDENCE BASED PSYCHOLOGICAL TREATMENTS FOR NEUROPATHIC PAIN, FIBROMYALGIA AND CHRONIC HEADACHE: A CONTROLLED AND RANDOMIZED TRIALS REVIEW

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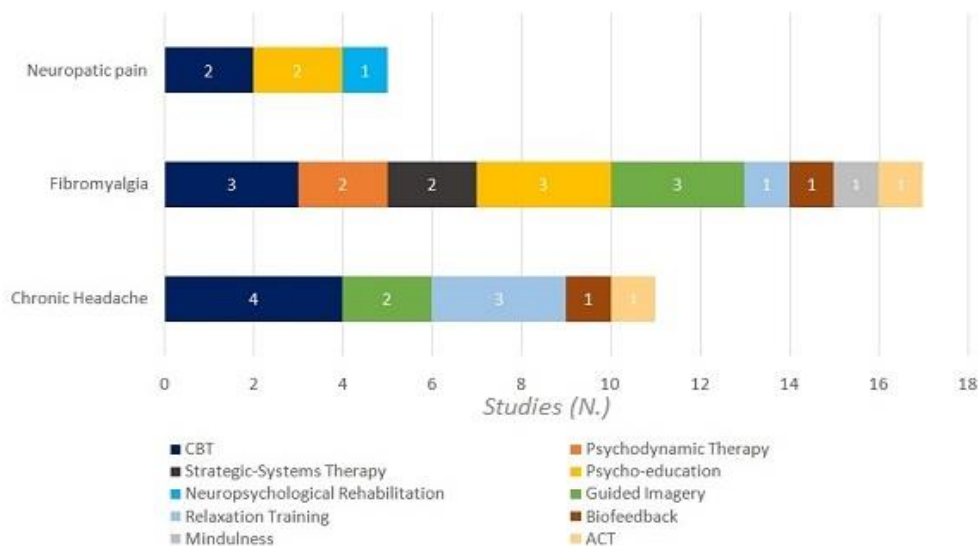
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Background and aims: Pain therapy settings often offer psychological interventions complementary to biomedical treatments. While a large scientific literature exists, there are relatively few strong evidences about the efficacy of psychotherapy in chronic pain. We reviewed randomized and controlled studies about the efficacy of psychotherapy in Neuropathic Pain (NP), Fibromyalgia (FM) and Chronic Headache (CH).

Methods: In March 2015 we searched the Cochrane Central Register of Controlled Trials using the keywords "psychotherapy", "neuropathic pain", "fibromyalgia" and "chronic headache". We excluded non-randomized works and identified psychotherapeutic approaches showing evidences of efficacy.

Results: NP - we found evidences for Cognitive-Behavioral Therapy (CBT) (2 studies), Psycho-education (PE) (2 studies) and Neuropsychological Rehabilitation (1 study). FM - we found evidences for CBT (3 studies), PE (3 studies), Guided Imagery (GI) (3 studies), Strategic-Systems Therapy (Ericksonian) (2 studies), Brief Psychodynamic Therapy (1 study), Relaxation Training (RT) (1 study), Acceptance and Commitment Therapy (ACT) (1 study), Biofeedback (1 study), Mindfulness (1 study). CH - we found evidences for CBT (4 studies), RT (3 studies), GI (2 studies), Biofeedback (1 study), ACT (1 study).

Conclusions: there is considerable terminological confusion and overlap between psychological approaches used in pain management: many of the above mentioned methods refer to similar practices under different names and therapists use them under different theoretical models. Our review supports that informative (psycho-education) and psycho-physiological interventions (biofeedback; relaxation training; guided imagery; mindfulness; ACT; neuropsychological rehabilitation) integrated in one of the 3 major psychotherapy models (CBT; psychodynamic therapy; strategic-systems therapy) are useful in chronic pain management.



SYMPTOMS CONCERNING PERSONS SUFFERING FROM CHRONIC PAIN OF CERVICAL AND THORACIC SEGMENT OF SPINE CONTRA SELECTED CHARACTERISTICS OF PERSONALITY

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Introduction

Failing to notice the individual differences and the role of psychological factors lowers the

effects of pain treatment. The aim of the research was to access the relations existing between the characteristics of patients' personality and the intensity of depressive symptoms, the intensity of fear and automatic negative thoughts, observed in a group of patients suffering from chronic pain.

Method

Thus, the research programme was concentrated on creating such regressive models that cover the examined variables and allow us to find out which hypothetical independent psychological variables (elucidating) cause regular changes of dependent variables (being elucidated) i.e. symptoms of depression. 93 patients of the Pain Therapy Outpatients' Clinic participated in the tests, having previously expressed their conscious agreement. The information from the semi-structural history, NEO-FFI, one part of the Inventory of State and Feature of Fear Scale by C. Spielberger, Strelau, Tysarczyk, Wrześniewski) conducted at the Pain Therapy Outpatients' Clinic accomplished the picture of chronic pain of cervical and thoracic segment of spine, concerning the examined patients.

Results

Due to the application of the cluster analysis method, two clusters of persons highly different from each other were observed. The dimensions that best differentiate the examined group consisting of persons suffering from chronic pain were distinguished.

Conclusion

The relations recognized in the tests reveal that, in case of the examined patients' general feeling, there are certain features typical for emotional and cognitive disorders. Moreover, they influence one another, creating the system, the main effect of which is powerlessness towards own ailments. The research is being continued.

ASSESSING BARRIERS TO IMPLEMENTATION: PHYSIOTHERAPISTS' EXPERIENCES OF IMPLEMENTING THE BACK SKILLS TRAINING INTERVENTION (BEST) IN CLINICAL PRACTICE

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Background and Aims

The Back Skills Training Trial (BeST) is a group-based cognitive-behavioural (CB) intervention for LBP that was found to be clinically and cost effective. To aid implementation, an online training package for clinicians (iBeST) was developed, however, initial implementation was found to be low. This study aimed to explore potential reasons for the low implementation of BeST in clinical practice.

Methods

A qualitative study nested within a larger RCT was used to explore physiotherapist experiences of implementing the BeST intervention in clinical practice. Semi-structured interviews were conducted with 11 musculoskeletal physiotherapists and thematically analysed using NVivo. Themes were subsequently categorised into determinants of behaviour change using the Theoretical Domains Framework (TDF).

Results

Three themes emerged: anxieties prior to implementation, experiences of delivery, and thoughts on future implementation. A number of barriers to implementation were identified, ranging from individual level factors (e.g. confidence in using CB skills), to organisational features (e.g. available facilities). Categorising theme content with the TDF identified common domains including knowledge, skills, beliefs about capabilities, social and professional role, beliefs about consequences, environmental context, and emotion.

Conclusions

This was the first study to report on physiotherapists' experiences of implementing a CB intervention for LBP, which highlighted the multifaceted and complex nature of using BeST in clinical practice. Identification of these barriers allows us to develop targeted strategies to support the future implementation of BeST.

EFIC5-0941

Pain treatment (psychological):Cognitive-behavioural treatment

A RANDOMIZED CONTROLLED TRIAL OF BRIEF TRAUMA-FOCUSED THERAPY FOR CO-MORBID POSTTRAUMATIC STRESS DISORDER AND LOW BACK PAIN - PRELIMINARY RESULTS.

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Background and aims: Posttraumatic stress disorder (PTSD) and chronic pain often co-occur and higher levels of pain and disability are found in patients with low back pain (LBP) and co-morbid PTSD. PTSD and pain are mutually maintained, why both conditions may need to be targeted for successful outcome. The aim of the present study was: 1) to assess the prevalence and impact of PTSD on LBP pain and disability and 2) to investigate the effectiveness of additional brief trauma-focused therapy for PTSD, pain and disability compared to treatment as usual (TAU). *Methods:* A one-year cohort of consecutive patients with LBP referred to Spinecenter of Southern Denmark was screened for PTSD (N=1045). Patients fulfilling the DSM-IV criteria for PTSD were randomised to either TAU or TAU+ brief trauma-focused psychotherapy (6-10 sessions, N=91). *Results:* In total, 25.3% had experienced a traumatic event and 7% fulfilled the criteria for PTSD. Patients with co-morbid PTSD suffered from significantly higher levels of pain (NRS) $d = 0.19$, $p < .01$ and lower levels of physical functioning (Roland Morris) $d = 0.20$, $p < .01$ and health related quality of life (HRQOL) $d = 0.21$, $p < .01$. Follow-up data are still collected; hence only preliminary results from the trauma-focused therapy are presented. Patients with a PTSD diagnosis were reduced from 71% to 40% after the brief intervention. PTSD symptom levels were moderately reduced $d = 0.48$, $p < .05$. *Conclusions:* Promising results were achieved with brief trauma-focused therapy for patients with LBP and co-morbid PTSD.

EFIC5-0958

Pain treatment (psychological):Cognitive-behavioural treatment

VIRTUAL REALITY PAIN MANAGEMENT DURING VENIPUNCTURE FOR CHILDREN WITH ONCO-HEMATOLOGICAL DISEASES: A PRELIMINARY REPORT

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Background and aims. Venipuncture is the most common painful procedure for children with onco-hematological diseases. Although several techniques for pain management are commonly used, high levels of pain remain a widespread problem. Immersive Virtual Reality (IVR) seems to reduce pain during several procedures included port access placement and intravenous access. Our aim is to test the feasibility and the effectiveness of IVR as distraction technique to reduce pain in patients undergoing venipuncture in the Onco-hematology Service of a children's hospital.

Methods. In this pilot study 2 cancer children and 2 thalassemic children were included. Using a within-subjects design, they underwent venipuncture twice: before with IVR and then receiving the standard care. Pain and IVR experience were investigated using a specific self-report questionnaire and coping strategies were evaluated using the italian version of the Waldron/Varni Pediatric Pain Coping Inventory.

Results. All patients in IVR condition referred lower levels of pain, time spent thinking about pain and unpleasantness of the procedure, than in control condition. Children using social support strategies reported higher levels of presence and a larger reduction of pain, unpleasantness and time spent thinking about pain during IVR, than children using cognitive strategies. No side effects emerged.



Conclusions. IVR seems to be an useful distraction technique for children pain management during venipuncture, in particular for patients using social support strategies. Our results suggest the need of a deeper study to evaluate IVR effectiveness during this procedure and to analyse the influence of coping strategies.

EFIC5-1006

Pain treatment (psychological):Cognitive-behavioural treatment

AN EXPLORATION OF MEANINGS AND IDENTITY CHANGE IN PATIENTS WITH FIBROMYALGIA ATTENDING A GROUP CBT PROGRAM

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Background and aims

Qualitative studies on FMS have shed light into the experiences of the subjects with chronic pain and the meanings of pain. However, little attention has been given to the role that identity play in their construction. Although health identity arises as a descriptive change feature in some phenomenological studies about FMS, these studies neither address explicitly the relationship between pain and identity nor explore longitudinally the evolution of their identities after following a therapy programme. In this context, our aim is to explore whether the meanings for pain and FMS and their identities change after attending a group CBT programme and if so, what are the patterns of change.

Methods

Data on meanings and identities were collected from a purposeful sample of 39 patients' diagnosed of fibromyalgia syndrome attending a group-CBT program in the Pain Unit of a Spanish Public Hospital through semi-structured interviews conducted before and after completion. We adopted a Grounded Theory approach.

Results

The participants' accounts clustered around two superordinate themes that were compared and analysed before and after completing the group CBT program. The two clusters were found to evolve in parallel, with the most radical changes in identity seen in those patients with more visible changes in the meanings allocated to pain and FM.

Conclusions

Some light has been shed into the relationship of meanings of pain and identity, thus illuminating the possibilities of CBT in intervening on the meanings of pain to ensure better outcomes.

LONG-TERM CLINICAL AND CORTICAL EFFECTS OF SYSTOLIC EXTINCTION TRAINING IN FIBROMYALGIA

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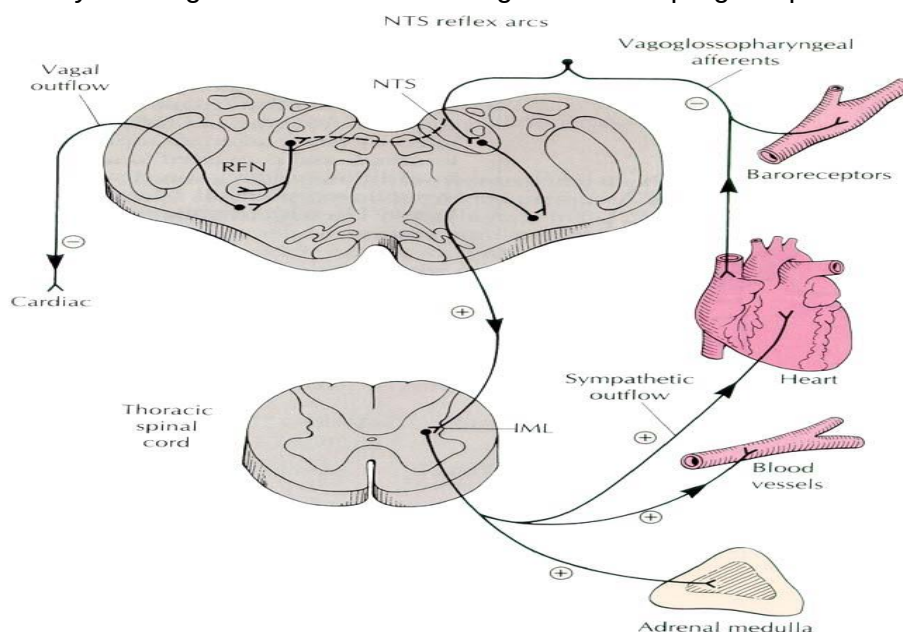
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Background and aims. Different studies report diminished baroreflex sensitivity in fibromyalgia (FM) patients that interferes the signal relay to the nucleus tractus solitaries (NTS) termed as NTS reflex arcs is associated with increased peripheral sympathetic stress responses and central sensitization in a hypertensive subgroup of FM. The present study examined central components of pain processing before and after systolic extinction training (SET) that combines operant behavioral therapy with baroreceptor training. SET aims at new-programming of the NTS reflex arc in FM.

Methods 20 FM patients and 32 healthy controls (HC) were treated with SET. Evoked potentials (N50, N150, P260, P390) to electrical stimuli of 3 different intensities were evaluated during either the systolic or diastolic peak of the cardiac cycle. Clinical pain, pain threshold and pain tolerance were assessed pre-, post- and at follow-up treatment.

Results FM showed a pretreatment attenuation of early evoked potentials (N50, N150) that increased to HC levels after treatment ($p < 0.01$). In addition, in FM both early and late evoked potentials were influenced by stimulus intensity (all p 's < 0.01) before but not after treatment. At 6-12 months, the magnitudes of potentials evoked by all stimuli were similar to that evoked in HC at baseline. Pain threshold and tolerance significantly increased after therapy and 82% of FM reported pain remission after 6-12 months.

Conclusions Cardiac gated peripheral afferent stimulation combined with behavioral treatment may induce changes in central pain processing that lead to pain remission. SET activates both sensory and cognitive-affective brain regions to new-program pain inhibitory mechanisms.



EFIC5-0098

Human behavioural science: Self and identity

A QUALITATIVE SYSTEMATIC REVIEW OF PATIENTS' EXPERIENCES OF CHRONIC PELVIC PAIN

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Background and aims - This is the first conceptual and internationally relevant synthesis of qualitative research exploring people's experience of chronic pelvic pain. Chronic pelvic pain is a prevalent pain condition with a high disease burden for men and women. We aimed to systematically search for, review and synthesise studies that explored patients' experiences of chronic pelvic pain.

Methods - We systematically searched five electronic bibliographic databases from inception until March 2014 supplemented by citation tracking. We used a combination of MESH and free text terms adapted from the InterTASC Information Specialists' Sub-Group (ISSG) Search Filter Resources. Out of 488 papers retrieved 32 met the review aim. Concepts are the primary data of meta-ethnography. Two team members read each paper to identify and collaboratively describe the concepts. We next compared concepts across studies and organised them into categories with shared meaning. Finally, we developed a conceptual model to explain the conceptual categories.

Results - Our findings incorporate the following categories into a conceptual model: relentless and overwhelming pain; threat to self; unpredictability, struggle to construct pain as normal or pathological; a culture of secrecy; validation by diagnosis; ambiguous experience of healthcare; elevation of experiential knowledge and embodiment of knowledge through a community.

Conclusion - Our model highlights the central struggle to construct 'pathological' versus 'normal' chronic pelvic pain. More research is needed to explore men's experience and to compare this with women's experience.

NEURAXIAL ADMINISTRATION OF ANALGESICS TO INTRACTABLE CANCER PAIN: A SYSTEMATIC REVIEW

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Background and aim: Approximately 2% to 5% of patients with advanced cancer have inadequate pain control with systemic medications. This review aimed to analyze the evidence to support neuraxial analgesic administration to patients with intractable cancer pain, considering balance between analgesia and side effects.

Methods: Search strategy was based on words related to cancer, pain, neuraxial analgesics and side effects (Jan/Feb 2014). Databases: PubMed, Embase, and Cochrane. Inclusion criteria: randomized controlled trials, $n \geq 20$, adults, cancer pain, failure with previous opioid treatment, long-term treatment outcomes, and English. Results, quality of evidence, and strength of recommendation (Grade Working Group) were analyzed.

Results: From 2142 abstracts, nine articles were analyzed and classified in: 1) neuraxial combinations of opioid (morphine or sufentanil) and adjuvants (bupivacaine, clonidine, ketamine, neostigmine or midazolam) vs. neuraxial administration of opioid alone ($n=4$), 2) single neuraxial drug bolus (morphine or aqueous phenol) vs. continuous administration ($n=2$), 3) single neuraxial drug (ziconotide) vs. neuraxial placebo ($n=1$), and 4) neuraxial opioid (morphine or hydromorphone) vs. other treatment than neuraxial therapy ($n=2$). Intrathecal and epidural routes were described. All studies presented limitations, which affected their internal validity. However, they demonstrated better pain control during combination of opioid and clonidine or ketamine, continuous infusion, administration of ziconotide, and use of implantable intrathecal system. Few significant side effects were described.

Conclusion: Few studies and low quality of evidence. As a result, weak recommendation for using neuraxial analgesics in adult patients with cancer. Further investigation is necessary.

Evidence-based Recommendations, a project of the EAPC-RN.

LIQUOR SAMPLE CONFIRMS INTRATHECAL FENTANYL OVERDOSE CAUSED BY INTRATHECAL PUMP MALFUNCTION

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Background and aims: Intrathecal fentanyl delivery can provide significant analgesic benefit in management of refractory chronic pain. Fentanyl is recommended as a first-line drug for intrathecal therapy in patients with chronic pain. However, the use of unapproved drugs like fentanyl in Synchromed II intrathecal pumps can lead to pump malfunctioning and intrathecal overdose.¹

Methods: We present a patient with a Synchromed II intrathecal pump for intrathecal infusion of fentanyl to treat chronic refractory back pain. Two years after implantation, the fentanyl concentration was 3000 mcg/L and the daily dose 1650 mcg. After a regular refill of the pump the patient began to show severe signs of overdose such as somnolence, nausea and respiratory insufficiency, which were successfully treated by naloxon. An intrathecal overdose was suspected and a lumbar puncture was performed.

Results: 420 minutes after the refill, the liquor concentration of fentanyl was 35.15mcg/L. This suggest that a malfunctioning of the pump led to an intrathecal overdose of fentanyl.

Conclusions: We present a case which suggest intrathecal fentanyl overinfusion due to pump malfunctioning as a consequence. Fentanyl it is cleared very rapidly from the CSF.² Therefore, the intrathecal concentration of fentanyl as high 35 mcg/L confirmed an intrathecal overdose in this patient.² Physicians should be aware of a possible pump malfunction and subsequent overdose in case of the use of unapproved drugs in intrathecal pumps.

Legend: Figure 1 - Intrathecal catheter tip at the level of Th 11.

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SPINAL ANALGESIA IN THE MANAGEMENT OF SEVERE CANCER-RELATED PAIN

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Background and aims

Pain that is poorly controlled by oral and transdermal opioids affects about 20 % of patients with advanced cancer. Spinal analgesia, where opioids and adjuvant drugs are administered either epidurally or intrathecally, is a useful method to relieve severe cancer pain. We reviewed the frequency and implementation of spinal analgesia in cancer pain management in a tertiary pain clinic.

Methods

A retrospective review of the charts of patients receiving spinal analgesia in the Helsinki University Hospital Pain Clinic during a five-year period from 2004 to 2009 was conducted.

Results

The intrathecal and epidural routes for spinal analgesia were used in 44 and 16 patients, respectively. The main reason for switching from oral or transdermal to spinal analgesia was inadequate pain relief and/or adverse effects of systemic opioid treatment. Only external catheters were used; more than one puncture at catheter placement was needed in 19 % and 29 % in the intrathecal and epidural groups, respectively.

Morphine and bupivacaine were used in all spinal infusions, with clonidine (33 %) or ketamine (20 %) as adjuvants. Satisfactory pain relief was achieved in all patients after a titration period of (mean) 13 days. Systemic opioids could be discontinued in 18 % of the patients. No severe adverse effects were recorded. Every sixth catheter was accidentally dislocated during follow-up.

Conclusions

Spinal analgesia was an effective method in relieving severe cancer-related pain at the end of life. An algorithm for spinal opioid treatment would be advisable to shorten the titration period.

EFIC5-0278

Pain treatment (invasive): Spinal analgesia

OUR EPIDUROSCOPIC ADHESIOLYSIS THERAPY EXPERIENCES WITH 30 PATIENTS

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Objectives

In our retrospective study it was aimed to evaluate the efficacy of epiduroscopic adhesiolysis therapy.

Methods

In this retrospective study, 30 patients who were operated lumbar disc herniectomy and still had pain. The patients who were operated in 1 or 2 years, had severe low back pain were included. The patients that had operated more than 2 were excluded from the study. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy, sensory loss, complications and satisfaction scores after the therapy were recorded.

Results

In this study the data of 30 patients were analyzed and found 12 (40 %) were male and 18 (60%) were female. Mean age of the patients was found to be 52.80 ± 14.74 . Mean VAS score before the therapy was 8.82 ± 1.17 , 1 month after the therapy it was significantly decreased to 4.61 ± 2.65 . Data of movement scores were found higher after the therapy than the scores before therapy. When the satisfaction data were analyzed it was found 26 (90.0%) patients were satisfied and 4 (10.0%) patients were unsatisfied. Patients had no complications.

Conclusion

Epiduroscopic adhesiolysis therapy is an effective and safe method in the treatment of the patients that had an operation before.

NO TRANSFER OF PRESSURE TO ADJACENT HUMAN DISCS DURING PRESSURE-CONTROLLED DISCOGRAPHY

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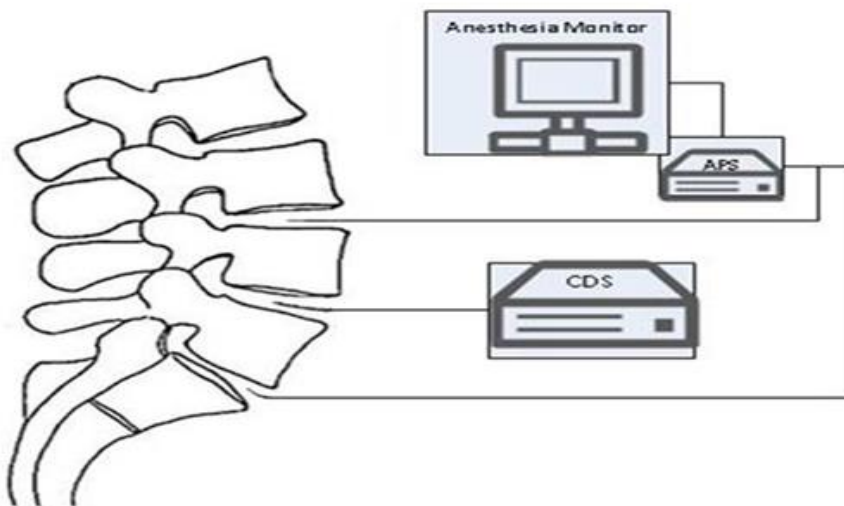
Background and Aims: Low back pain (LBP) is a common health problem and a substantial part of LBP is presumed to be attributable to degeneration of the intervertebral disc. To determine whether the low back pain originates from a degenerated disc, provocative discography can be a useful diagnostic test. However, because the procedure requires the patient's subjective pain response, provocative discography is also a controversial test. Recently, an in vivo pork study showed pressure transmission during discography to the adjacent discs. This could imply that concordant pain - as experienced by the patient during intradiscal injection - potentially originates from another disc level. Therefore, the aim of this study is to verify whether there is a similar pressure transmission during human lumbar pressure-controlled provocative discography.

Methods: Patients (age between 18 and 65) with intractable low back pain, and at least 50% disc height, were eligible. Exclusion criteria were local infection, pregnancy, iodine allergy, use of anti-coagulants, and prior lumbar surgery of the suspected level. While performing low-speed flow, pressure-controlled, discography, an arterial blood pressure monitoring system assessed the pressure in the adjacent discs. Figure 1.

Results: Fifty patients were assessed, 48 procedures showed no pressure differences and in 2 patients a minor pressure rise (1.1 psi) in the adjacent disc was recorded. In patients with a positive discography, the mean intradiscal peak pressure was 15.1 (SD = 11.1) psi.

Conclusions: Pressure-controlled, low-speed flow, lumbar provocative discography does not induce a pressure rise in adjacent discs. This renders false-positive pain reactions during pressure-controlled discography highly unlikely

Figure 1. Schematic Diagram of Intradiscal Pressure Monitoring



EFIC5-0521

Pain treatment (invasive): Spinal analgesia

PERCUTANEOUS FLUOROSCOPIC SYNOVIAL CYST ASPIRATION TREATMENT OF LUMBAL FACET SYNOVIAL CYST ACCOMPANIED BY BACK PAIN AND RADICULOPATHY (CASE REPORT)

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Introduction: Lumbar facet joint synovial cysts may cause lower extremity radiculopathy, spinal stenosis and pack pain. In this case report, we hereby present a case treated in our clinic using percutaneous fluoroscopic synovial cyst capsule fenestration.

The case, 46-year old female, with a diagnosis of synovial cyst located at L5-S1. The patient had fallen 4 months ago and complained of back pain for the last 2 months in particular when sitting. A synovial cyst arising from the facet joint at left L5-S1 level and pressuring on the nerve root was detected in the MRI image.

A percutaneous synovial cyst aspiration guided by real-time fluoroscopy was planned for the case. Facet joint was accessed with a 25 G spinal needle. After entering the facet joint, we moved forward within the facet joint guided by real-time fluoroscopy. Upon reaching the anterior part of the facet joint, aspiration was performed and a total of 0.2- 0.3 ml fluid was aspirated from the cyst. When the patient in prone position expressed her relief immediately after aspiration, the procedure was completed. The case was treated with NSAIDs and a control MRI was performed at post-3 weeks. It has been determined that the synovial cyst is smaller and no longer pressuring on the nerve root. The case continues her life without any pain or neurological findings.

In conclusion, we believe that percutaneous fluoroscopic synovial cyst aspiration can be an effective and safe treatment in well-selected lumbar facet synovial cyst cases.

EFIC5-0563

Pain treatment (invasive): Spinal analgesia

EPIDURAL STEROID INJECTIONS: ARE THEY REALLY DANGEROUS? A CANADIAN PAIN CENTER EXPERIENCE.

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Background and aims

Spinal pain is the most common of all chronic pain disorders and epidural steroid injection (ESI) is a treatment used world wide. In 2014 two Food and Drug Administration (FDA) warnings were published and declared the possibility of serious or even catastrophic complications after ESI, including paralysis, nerve damage, or death. Our goal is to know what kind of complication occurs in our pain center with ESI.

Methods

Electronic files of epidural procedures in our pain center from 2010 to 2014 were revised for a mortality and morbidity reunion in our department. Five hundred and nine files of patients with spinal or cervical pain were analyzed. We excluded the patients who didn't receive an epidural treatment.

Results

Three hundred sixty-five patients of the 509 patients received at least one epidural treatment. 1651 epidural treatments were analyzed, 923 lombar, 606 caudal, 95 lombar transforaminal and 27 cervical injections. A total of thirty complications (1.8%) were encountered, including a suspected case of transient ischemic attack (TIA) after a paracervical infiltration, 3 episodes of unexplained hypotension and desaturation, one rachianesthesia, 6 vasovagal reactions, two hypocorticisms, one cushing, one facial oedema, one fever without infection, one retrosternal pain and 13 dural punctures.

Conclusions

The results were presented at our pain center and we took the decision to be more rigourous about the selection of patients for cervical procedure including paracervical injection. Dexamethasone may be a safer alternative for paravertebral cervical injections.

EFIC5-0893

Pain treatment (invasive): Spinal analgesia

LATERAL PARASAGITTAL VERSUS MIDLINE INTERLAMINAR LUMBAR EPIDURAL STEROID INJECTION FOR MANAGEMENT OF CHRONIC LOW BACK PAIN WITH LUMBAR DISC HERNIATION

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Epidural steroid injections are popularly used for management of low back pain by interlaminar or lateral parasagittal routes. We compared the efficacy of the PIL and MIL approach in pain relief.

Methods: In a double blinded randomized clinical trial , 80 ptients received ESI either by the PIL or MIL. Patients were assessed for pain by visual analog scale (VAS) and for disability and impairment using the Oswestry Disability Index (ODI) before, 1,3,6,12 and 24 months after ESI.

Results: In the MIL group pain scores were reduced from a mean of 8 to a mean of 4.1 ($P < 0.001$); In the PIL group pain scores were reduced from a mean of 8.3 to a mean of 3.1 ($P < 0.001$). VAS scores were significantly lower in the PIL group. ODI scores were significantly lower in the PIL group compared with the MIL group. The improvement success rate was 88% in PIL group and 80% in MIL group that was significantly higher in the PIL group($p=0.045$). In the PIL group, ventral epidural spread significantly higher (89%) as compared with (32%) in the MIL group including both first and repeat injections ($P=0.001$). Opioid Intake were significantly lower in the PIL group.

Conclusion: Epidural steroid injection administered with the PIL approach was significantly more effective for improvement in pain and disability than the MIL approach for 24 months in the management of chronic low back pain with lumbar disk herniations.

EFIC5-0959

Pain treatment (invasive): Spinal analgesia

IMPLANTATION OF INTRATHECAL MORPHINE PUMP DECREASES PAIN SCORE AND INCREASES MOBILITY IN END STAGE CANCER PATIENTS. CASE SERIES OF 13 PATIENTS.

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Background

85% of end stage cancer patients experience pain. 60% of them, experience strong chronic cancer pain and need high doses of opioids in combination of other analgesic agents in order to treat their pain. 10% of end stage cancer patients experience pain greater than VAS 8/10 although in high doses of opioid treatment.

Aim

Our aim is to treat chronic cancer pain resistant to opioids in patients who have a prognosis of more than 6 months. We are presenting our three years experience.

Method: 13 patients with end stage cancer, were in daily great pain of VAS 7-10/10 (mean value 9.3/10) although their daily oral morphine dose (all opioids were converted to oral morphine dose). Mean patients' age was 48 years old (range 28-71).

Results

All patients were evaluated with VAS score, McQuill questionnaire and Modified questionnaire of quality of life every month.

Out of 13 patients, two patients died in less than three months after pump insertion. One patient lived 19 months, Mean survival time was 13 months.

Intrathecal morphine was used in all patients up to 6mg a day (mean dose 3.5mg/day)

Mean VAS was 3/10. (range 1-5/10).

All patients had improved score on quality of life questionnaire on

One patient developed meningitis and pump was removed 7 days after insertion.

No other side effects or complications were noticed.

Discussion

Insertion of intrathecal morphine pump in end stage cancer patients with resistant pain is effective and improves quality of life.

LUMBAR SPINAL STENOSIS: A SURVEY ABOUT DIAGNOSIS AND TREATMENT AMONG PAIN PHYSICIANS.*S. Narayanan¹, V. Bandikatla², R. Soundara Rajan³, S. Gupta²*¹*Anaesthesia, Queen Elizabeth Hospital, Newcastle-upon-tyne, United Kingdom*²*Anaesthesia and Pain Medicine, Bradford Teaching Hospitals Foundation Trust, Bradford, United Kingdom*³*Anaesthesia and Pain Medicine, University Hospital of North Staffordshire, Stoke-on-Trent, United Kingdom*

Background and Aims: Lumbar spinal stenosis(LSS) is a common clinical condition that lacks specific diagnostic and treatment guidelines. We performed an online survey to study current practices among pain physicians.

Methods: 20 questions regarding diagnosis, treatment options and interventions were surveyed using www.surveymonkey.com website. Pain physicians identified through pain consultants' google groups and hospital lists in Canada and United Kingdom were emailed the questionnaire link. Responses were collected between 23-06-2014 to 15-09-2014 and then analysed.

Results: 99 responses were obtained in total. 87%(86) preferred imaging for diagnosing LSS of which 88%(76) utilized MRI scanning. Symptoms considered for conservative only treatment were reduced walking distance (41%) and worsening pain (31%). 84%(83) considered motor power loss and 82%(81) considered bowel and bladder disturbance as symptoms for surgical referral. Interventional procedures like epidural steroid injections(ESIs) were performed by 79%(78) for worsening pain (73%) and reduced walking distance (65%).

Conclusions: A majority of pain physicians preferred MRI scans for diagnosing LSS. Conservative, surgical and interventional treatment modalities were all equally considered. When performing ESIs, a wide variation in approach, level of injection, type of steroid, carrier and the volume of injectate is noticed. Though recommended by governing bodies and guidelines, use of fluoroscopy and/or contrast to confirm the final position is still not universal. This survey provides a snapshot of the diagnosis and management of LSS. Further research into the condition will help formulating guidelines that potentially improve outcomes.

Table 1. Results - Interventional therapy for LSS							
Number of pain physicians performing interventional procedures 79% (78)							
Which approach would you use for epidural steroid injection	Which steroid would you use	What carrier solution do you use for epidural steroid injection	What volume of injectate do you use	What is your end point for epidural injection	Do you use fluroscopy for epidural injection	Do you use contrast for epidural injection	At what level do you perform epidural Injection
Interlaminar 42% (42)	Triamcinalone 35% (35)	Normal Saline 24% (24)	7 to 12 mls 34% (34)	Set volume 56% (55)	Would use 65% (64)	Would use 63% (62)	Below level of stenosis 32% (32)
Caudal 22% (22)	Methyl prednisolone 32% (32)	Bupivacaine 18% (18)	2 to 6 mls 27% (27)	Back pain or fullness 19% (19)	Would not use 9% (9)	Would not use 11% (11)	At level of stenosis 17% (17)
Transforaminal Bilateral 6% (6)	Dexamethasone 8% (8)	Levo-bupivacaine 17% (17)	> 13 mls 12% (12)		Sometimes 1% (1)	Sometimes 1% (1)	Both above and below level of stenosis 13% (13)
Transforaminal Unilateral 4% (4)		Lidocaine 12% (12)					Above level of stenosis 5% (5)

EFIC5-1015

Pain treatment (invasive): Spinal analgesia

MORPHINE PUMP IMPLANTATION IN THIGH. CASE REPORT

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Implantation of a morphine pump in a thigh. Surgical Technique, complications and reasons. A typical placing is not ever possible.

EFIC5-1034

Pain treatment (invasive): Spinal analgesia

THE ROLE OF EPIDURAL MORPHINE ON THE PREVENTION OF POST-VAGINAL PERINEAL CHRONIC PAIN

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Background and aims: The usefulness of morphine in treating post-vaginal delivery perineal acute pain is fully demonstrated. But its role on the prevention of chronic pain still remains unclear. The aim of this study is to evaluate the incidence of chronic pain on a group of patients previously treated with epidural morphine after vaginal delivery.

Methods: On a single-blind placebo-controlled study, we included 33 women who had chosen epidural analgesia for labor and had three-four perineal tear after vaginal delivery. After delivery participants were randomized to either 0.05 mg/kg epidural morphine or 10 ml normal saline. All patients received a scheduled treatment with NSAID for 24 hours and paracetamol or morphine on demand. The primary outcome was the proportion of patients in each group with persistent chronic perineal pain after one year. Secondary outcomes are: requested extra analgesia in the first 24 hours postpartum and side effects amongst others.

Results: 33 patients were randomized in the study: 15 morphine group and 18 saline group. No differences between groups for potential confounders. VAS 2.1 and only 1 patient on the morphine group ask for rescue medication versus VAS 7.8 and 17 patients in the group of saline. We find significantly more side effects on the group of morphine. On the long term follow-up, there were 5 patients in the morphine group experiencing chronic perineal pain versus 9 patients in the saline group.

Conclusions: Epidural morphine after vaginal delivery not only reduce acute postoperative pain but reduce the incidence of chronic pain in the long term.

EFIC5-0017

Multidisciplinary pain treatments

DISC PROLAPSE TREATMENT BY INTEGRATED SYSTEM

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COMMON PROBLEMS DUE TO DISC PROLAPSES AND HERNIATION

Many patients suffer with back pain, legs pain or weakness of the lower extremities of muscle are diagnosed with a herniated disc.

Some patients come

to Physicians for treatment of pain

at both legs and backache with weakness. Some doctors diagnose for Lumbago Sciatica and some of them for PLID

Accordingly patients are treated with Physiotherapy and Medicine at the primary stage.

Due to application of pain killer Medicines, patients feel pain free at some extent, but it is revived again when Medicine & Physiotherapy are stopped.

Gradually, the

case converted into Paraplegia.

Most of Neuro Surgeons and Orthopedics advised to the patients for Laminectomy to relief the instant pain.

Anatomy Of Normal Lumbar Disc

In between each of the 5 lumbar vertebrae is a disc, a tough fibrous shock-absorbing pad.

Endplates line

the ends of each vertebra and help hold individual discs in place

Each disc contains

a tire-like outer band (called the annulus fibrosus) that encases a gel-like substance (called the nucleus pulposus).

When a disc herniation occurs, the cushion that sits between the spinal vertebra is pushed outside its normal position

EFIC5-0029

Multidisciplinary pain treatments

EVALUATION OF TRANSCRANIAL MAGNETIC STIMULATION IN THE TREATMENT OF NON-VISCERAL CHRONIC PELVIC PAIN.

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Eighteen patients were randomly included into two groups (A and B) accordingly to the use of active rTMS (rTMS-a) or sham rTMS (rTMS-s), respectively, applied in the representation area of the pelvis and motor cortex perineum primary as the first approach. The DPC was severe, the patients presented high scores of anxiety and depression, pain caused negative impact on physical and daily activities, self-perceived health status, female sexual function and quality of life and there was high incidence of myofascial pain syndrome the pelvic muscles and hip. rTMS-a provided significant improvement of pain in patients initially treated with rTMS-a and rTMS-s resulted in significant but less expressive improvement in pain when it was preceded by treatment with rTMS-a. There was no significant change in the values of the scores of depression and anxiety and of the Female Sexual Function Index in patients initially treated with rTMS-a it and there was an increase in the value of the score anxiety in patients initially treated with rTMS-s. The results of initial treatment with rTMS-a or rTMS-s influenced the outcome of the second procedure. The resting motor threshold was high, the intracortical inhibition was reduced, and the intracortical facilitation normal. There was correlation between the resting motor threshold and the affective descriptors of the McGill Pain Questionnaire and between reduced intracortical inhibition and the increased number of affective descriptors of the same questionnaire. rTMS is a safe procedure and therapeutic alternative for patients with DPC.

EFIC5-0068

Multidisciplinary pain treatments

PAIN CONTROL USING PSYCHO-EDUCATION IN CRPS PATIENTS. IS IT ALL DEPENDENT ON PERSONALITY?

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BACKGROUND AND AIMS: Our aim was to examine the efficiency of psycho-educational intervention in CRPS patients with different personality styles (the 'Big Five' factors: neuroticism, extraversion, openness, conscientiousness and agreeableness). It was assumed that patients with different personality traits will respond to the psycho-educational treatment in different ways in the aspects of pain and coping strategies.

METHODS: A controlled research among CRPS patients was performed. Patients(N=20; ages: 19-67), were randomly divided into two groups. The test group was presented with a cartoon explanatory film about CRPS. The control group viewed a film on smoking habits.

Indexes of pain and personality were collected, utilizing built-in questionnaires for self-reporting at three time points: Before-, immediately after-, and 30 days after viewing the film.

RESULTS: A significant difference was found in the change of parameters of physical ($P=.03$) and emotional ($P=.02$) pain indexes, evaluated before viewing the film and right after viewing it. Results showed that the test group experienced a decrease in physical and emotional pain, while in the control group there was an increase of physical and emotional pain. Furthermore, this change remained significant ($P=.02$) 30 days later for the physical pain parameter. In addition, a significant positive correlation ($r=.59$, $p=.05$) was found between openness and the change in physical pain, in the test group.

CONCLUSIONS: Psycho-educational intervention is important in decreasing physical and emotional pain intensity of CRPS patients. The intervention is especially efficacious for patients who are characterized by low openness.

**A PAIN SERVICE FOR CHRONIC POST CARDIAC SURGERY AND INTERVENTIONAL PAIN
- THE FIRST YEAR**

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Background

A recent publication has described high levels of chronic pain after cardiac surgery: 22.1 %, 16.5% and 9.5% at 6 months, 12 months and 24 months, respectively [1]. Further, wait times for care at a chronic pain clinic are very lengthy. To improve this situation we instituted a chronic pain clinic specifically for patients with pain secondary to cardiac procedures.

Methods

We obtained hospital approval and clerical support for our multidisciplinary clinic as well as ethics approval for acquisition and presentation of data. Referrals have been both internal (surgeons, cardiologists, urgentologists) and external (family physician and other surgeons). The clinic was operational ½ days twice a month and includes physician, nursing, physiotherapy and psychotherapy support as needed.

Results

We have seen 31 patients. Of these, 8 have been discharged pain free. Comorbidities included hypertension 70%, dyslipidemia 66%, obesity 33%, diabetes 30%, arthritis 11%, other pain syndromes 7.5% and other problems 55%. Fifty percent suffered from depression, and 75% had symptoms of neuropathic pain. Maximum and minimum pain on movement was 10 and 5, respectively. Ninety percent said that the pain had impacted their lives and 81% had already tried at least one medication for the treatment of pain. During follow-up visits 55% were treated with anticonvulsants, 45% with topical agents, 39% with acetaminophen, 13% with opioids, 10% with anti-inflammatories and 3% with antidepressants.

Conclusion

Pain after cardiac surgery or other cardiac intervention, such as pacemaker insertion, severely interferes with quality of life. Early multimodal treatment can affect beneficial change.

TREATMENT FIDELITY AND PROFICIENCY OF A NURSE-LED MOTIVATIONAL INTERVIEWING (MI) BASED PRE-TREATMENT IN PATIENTS WITH NON-SPECIFIC MUSKULOSKELETAL PAIN

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Objective

To evaluate treatment fidelity and proficiency of a nurse-led Motivational Interviewing (MI)-based pre-treatment and a control condition.

Methods

The Motivational Interviewing Treatment Integrity (MITI) Scale was used. A random sample of 20% of all available audio recorded sessions provided during a RCT was scored by one rater (n=64, n= 37 intervention condition, 27 control condition). Out of this sample, 26 sessions (18 intervention condition, 8 control condition) were also scored by a second rater. Differences in MI fidelity between conditions were tested and inter-rater reliability was calculated.

Results

According to the MITI, the nurses' basic competence in the use of MI was satisfactory for three out of five Global Counselor Ratings. Except for one, all mean Global Counselor Ratings were higher in the MI-based intervention, but differences were not statistically significant. In the intervention group only, the threshold for basic competence in MI was exceeded for one Summary Score and one additional measure (Empathy). Reliabilities between the two raters were mixed with ICCs ranging from 0.12-0.96.

Conclusions

Higher levels of fidelity for 3 out of 5 fidelity scores in the intervention condition confirmed that MI was partially applied in the MI-based intervention.

MI basic competence was not fulfilled for all items. Furthermore, the two interventions could not be statistically discriminated.

These results seem to suggest the need for rigor selection of MI-counselors before training, continuous supervision, and fidelity checks in studies using MI.

DIFFERENCES IN PSYCHO-PHYSICAL CAPACITIES BETWEEN PATIENTS WHO ARE THREATED IN THE INTERDISCIPLINARY PAIN REHABILITATION PROGRAM AND THOSE WHO ARE NOT

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Background and aims: At our institution an interdisciplinary pain rehabilitation program for patients with chronic widespread was implemented two years ago. Patients have a screening examination by: doctor, psychologist, physiotherapist and social worker. On the ground of their psycho-physical capabilities patients are directed in the group based rehabilitation program (adjusted or cognitive behavioral oriented), they are individually treated or not suitable for interdisciplinary rehabilitation (not motivated, psychiatric issues, social issues). The aim of our study was to show the differences in psycho-physical capacities between the different groups of patients.

Methods: 199 patients were assessed in the screening examination during 2014. They completed psychological questionnaires: pDETECT scale, Chronic Pain Acceptance Questionnaire (CPAQ), Pain Catastrophizing Scale (PCS), Tampa Scale of Kinesiophobia (TSK), State Anxiety Scale (STAI-X2), Center for Epidemiologic Studies Depression Scale (CES-D) and had measurement of their physical capabilities (6 minutes walk test, Berg's scale). They were divided into four groups: the adjusted program, the cognitive behavioral oriented program, individual rehabilitation, not suitable for interdisciplinary rehabilitation.

Results: The results of the Kruskal-Wallis Test show statistically important differences between the groups of patients' on psychological tests and the pDETECT scale. The physical capacities measured with 6 minutes walk test and Berg's scale do not differ importantly (Table 1). Patients which are not suitable for the rehabilitation have the lowest capacities in comparison with other groups (Table 2).

Conclusions: The groups of patients show important differences in their overall capacities and must have customized approaches of rehabilitation.

Table 1

The results of the Kruskal-Wallis test between the groups of patients.

	CPAQ	TSK	STAIx2	CESD	PCS	<u>pDETECT</u>	6 min test	Berg
Chi-Square	9,36	8,95	17,34	9,48	14,17	13,15	1,49	2,11
p	0,025	0,030	0,001	0,024	0,003	0,004	0,684	0,549

df=3

Table 2*Average values in groups of patients on different tasks.*

program	CPAQ	TSK	STAI-X2	CES-D	PCS	pDETECT	6 min	Berg
PIRP	47,5	42,7	48,9	22,7	38,2	22,2	266,9	49,4
IPFO	54,6	39,6	42,9	18,4	34,1	19,6	292,9	51,0
individual	50,0	39,2	48,9	21,9	36,8	19,1	258,3	47,0
not suitable	44,6	43,9	53,0	25,7	39,6	22,7	235,4	45,6

Note: PIRP – adjusted program, IPFO – the cognitive behavioral oriented program, individual - individual rehabilitation, not suitable – not suitable for interdisciplinary rehabilitation.

EFFECT OF INPATIENT PAIN REHABILITATION TREATMENT IN PATIENTS WITH SEVERE MUSCULOSKELETAL PAIN RELATED DISABILITIES AND HIGH LEVEL OF PSYCHOSOCIAL DISTRESS

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Background and aim: in a previous study (2013, J.L. Swaan et al) we examined the characteristics of the inpatient population with chronic musculoskeletal pain (CMP) in comparison with the outpatient population, which confirmed that the first mentioned has a worse condition regarding to pain related disability and psychosocial distress. The aim of this study is to evaluate the effectiveness of an inpatient multidisciplinary rehabilitation program in this highly disabled group.

Methods: this is a retrospective cohort study evaluating multidisciplinary inpatient rehabilitation at Rijndam rehabilitation centre, Rotterdam, during the course of 2010-2014. Pain impairment was measured using the pain disability index (PDI), pain intensity and fatigue using NRS scores, and quality of life using the RAND-36.

Results: a total of 86 patients (age>18yrs) were evaluated at intake and 24 also at the end of the 12-weeks rehabilitation program. Medical diagnosis was mainly chronic low back pain (40%) and generalised pain (33%). Most patients were female (85%). Mean age was 36y(18-65). Using paired sample t-tests for statistical analysis of changes in PDI, RAND-36 and NRS scores before and after inpatient treatment, our results show that there is a significant decrease in PDI scores (mean difference score= 17.9) and NRS scores (mean difference score= 1.16) before and after treatment ($p<0.001$) and a significant improvement in some dimensions of the RAND-36.

Conclusions: an inpatient multidisciplinary rehabilitation program, as is instilled at Rijndam rehabilitation centre, shows a significant improvement of pain disability and quality of life in patients with severely disabling CMP.

EFIC5-0199

Multidisciplinary pain treatments

STUDY OF THE EFFICACY OF FENTANYL PECTIN NASAL SPRAY DURING TWO YEARS IN ELDERLY PATIENTS WITH NON-CANCER BREAKTHROUGH PAIN

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Introduction:

Patients with osteoarticular diseases also suffer breakthrough pain, particularly associated to walking, and which in this study has been treated with fentanylpectin nasal spray.

Material and methods:

A two-year study was carried out involving 22 patients, of which 10 completed the study (8 females and 2 males; mean age 74.72 years, range 60-88). The patients could be diagnosed with two or more of the following conditions: Vertebralcollapse-fracture, canal stenosis, disc hernia, spondylodiscarthrosis, sequelaeof arthrodesis, gonarthrosis.

The basal pain was treated with: Extended-release opiates, antidepressants, antiseizure drugs, NSAIDs, etc., as well as different infiltrations.

An evaluation was made of the efficacy of fentanyl pectin nasal spray inapplication to breakthrough pain associated to walking.

Results:

The following was recorded to this effect: Movement pain VAS, SF-12 and EQ-5Dhealth questionnaires, Oswestry disability scale, MOS sleep scale, and patientglobal impression of change (PGIC).

All the scales showed statistically significant improvement.

Conclusions and comment:

Fentanyl pectin nasal spray affords breakthrough painrelief and better quality of life by allowing a degree of mobility, improvedself care, simple domestic and leisure activities, and improved sleep quality

LIVE WITH ENDOMETRIOSIS: QUALITATIVE APPROACH OF SOCIAL MEANING INVOLVED IN CHRONIC PAIN

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The symptoms associated with endometriosis may have an impact on the physical well-being, emotional and social development of affected women, so it is essential to evaluate women's complaints, and give you time to express their concerns and anxieties. Because of its chronic and progressive condition, endometriosis causes symptoms that affect the daily lives of women who suffer from this painful condition, especially with regard to the isolation social.

Many epidemiological evidences suggest that social ties are important to human health. Lack of social integration may be associated with poorer health outcomes and impaired quality of life. In human species evolution, social structures evolved in parallel with neural, hormonal, genetic, and molecular mechanisms to support them. Social networks are essential for humans to survive, reproduce, and transmit a genetic legacy. Social ties may have important implications for physical as well as psychological well-being for patients with chronic diseases.

Thinking this scenario, our goal was to investigate how endometriosis can interfere corroborating the social isolation of women living with chronic pain.

THE ROLE OF CONVENTIONAL AND COMPLEMENTARY APPROACHES IN CHRONIC PAIN – A CASE OF SUCCESS

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Background:

Chronic pain management is a challenge because of its clinical complexity and impact on quality of life [1]. We describe a case of chronic pain spanning more than two decades of evolution, presented to the Pain Unit of Hospital Pedro Hispano (PU-HPH).

Case Report:

57 year-old female, history of lumbar trauma 23 years ago, resulting in paracentral disc herniation. Submitted to laminectomy and foraminectomy. Development of persistent pain (9/10), with hyperalgesia and allodynia in the lumbosacral region and left thigh. Pharmacological (non-opioid and opioid analgesics, antidepressants and anticonvulsants) and interventional (epidural injections and implantation of an epidural octopolar neurostimulator) approach. Physiotherapy and psychiatric consultation. No significant reduction in the pain intensity and occurrence of severe side-effects.

Referred to the PU-HPH. Major depressive disorder and physical disability - walking and standing difficulty. Pulsed radiofrequency (cluneal nerves and quadratus lumborum muscle), trigger point injections and acupuncture. Participation in hypnosis sessions. Gradual resolution of pain and depressive symptoms. Progressive reduction of medication.

Currently, able to walk unaided. Minimal pain (1/10) without medication.

Discussion:

Chronic pain treatment should go beyond pain relief. Achieving a better quality of life and a reduction of medication is crucial.

Investigations suggest that hypnosis affects neurophysiological mechanisms, reducing pain intensity, duration and frequency [1]. Acupuncture's efficacy in the treatment of chronic back pain has been demonstrated thus it should be combined with conventional therapy [2].

This case highlights the importance of a multimodal and multidisciplinary approach in these patients.

References:

[1]-TBM 2012; 2:65-72

[2]-N Eng J Med 2010; 363:454-461

WORK RELATED FEARS MAY CORRESPOND WITH ACTUAL EMPLOYMENT STATUS IN PATIENTS WITH CHRONIC LOW BACK PAIN.

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Background:

In industrial societies patients with back pain may be threaten to lose their job or may have difficulties to return to work. Aim of this investigation was to look if the current employment status may have an influence on the outcome of an rehabilitation-programme and on the perceived fears related to the probabilty to return to work.

Method :

165 patients with chronic low back pain of an outpatient rehabilitation programme were available for an analysis At the beginn and the end of the programme questionnaires (RM, Korff, FABQ-D) and a modified goal attainment score were included in the assessment.

Results:

94 patients, who were currently in empoymnt showed significantly lower scores in the FABQ2 (median range 52,91), while unemployed or persons on sick leave (n=67) scored higher (median range 121,01, p<0,001). The results in detail will be presented.

Conclusion: the patients view about the ability to return to work may have a substantial impact on the outcome of rehabilitation programmes and should be adresssed by special interventions.

DO ASPECTS OF PAIN GUIDE SELECTION TO MULTIMODAL PAIN REHABILITATION ACROSS GENDER?

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Background and aims: There is growing evidence on the treatment of chronic pain using multimodal rehabilitation programs (MMRP). However, less is known about patient selection for this treatment modality. The aim of the study based on data from the Swedish Quality Registry for Pain Rehabilitation (SQRP) was to investigate if aspects of self-reported pain were associated with selection of patients to MMRP.

Methods: Patients with chronic pain (464 men and 1226 women) from two clinical departments in Sweden were included. After a multidisciplinary assessment the patient was offered MMRP or not. The patients filled in a questionnaire regarding demographics, pain, psychological symptoms, function, activity/participation, and general health. Using multiple logistic regression association of aspects of pain with selection to MMRP (no/yes) were investigated. Covariates were age, educational level and multiple aspects of pain. Anxiety and depression (hospital anxiety and depression scale) and work status were used in sensitivity tests.

Results: For women high pain intensity during the last week (OR 0.86; CI95% 0.79-0.95) and high pain severity (multidimensional pain inventory) (0.78; 0.64-0.96) were associated with less selection to MMRP while pain interference with daily activities and number of pain sites were not. For men none of these measures was associated with selection to MMRP.

Conclusions: This practice based study showed that higher scores on self-reported pain did not lead to selection to multimodal pain rehabilitation, and in women there was a negative association for some pain measures. Probably other factors than pain guide selection to multimodal pain rehabilitation.

**THE RADIATION EXPOSURE OF FLUOROSCOPIC MODES DURING C-ARM
FLUOROSCOPY GUIDED MEDIAL BRANCH BLOCKS**

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Introduction

C-arm fluoroscope is important device in pain management. However, radiation exposure is unavoidable. We investigated the radiation exposure of pulsed and low-dose modes during median branch blocks (MBBs).

Method

This study was a prospective randomized controlled trial of 600 MBBs. One side (right or left) of MBBs at L3, 4 and 5 was conducted under 4 type of C-arm fluoroscopic modes (conventional, pulsed, low-dose and pulsed with low-dose mode). The data of patients' age, height, sex, laterality (right/left), exposure time (ET), radiation absorbed dose (RAD), and effective dose (ED) at side of table were collected.

Result

There were no significant differences in age, height, sex and laterality in each modes. There were no significant differences of ET between conventional mode (6.7 ± 3.2 sec) and low-dose mode (6.6 ± 3.9 sec) and between pulsed mode (3.6 ± 3.1 sec) and pulsed with low-dose mode (3.4 ± 3.2 sec). ET of conventional and low-dose modes were higher than pulsed and pulsed with low-dose modes ($P < 0.05$). The RADs were different in each modes (conventional mode: 31.5 ± 18.9 radcm², low-dose mode: 14.2 ± 13.1 radcm², pulsed mode: 19.5 ± 17.9 radcm², pulsed with low-dose mode: 8.8 ± 11.1 radcm²). The EDs were also different in each modes (conventional mode: 3.9 ± 2.8 μ Sv, low-dose mode: 1.6 ± 1.7 μ Sv, pulsed mode: 2.3 ± 2.0 μ Sv, pulsed with low-dose mode: 1.0 ± 1.1 μ Sv).

Conclusion

Low-dose, pulsed, and pulsed with low-dose modes can effectively decrease the RADs and EDs.

EFIC5-0323

Multidisciplinary pain treatments

LONG TERM BLOOD PRESSURE CONTROL EFFECT OF CELIAC PLEXUS BLOCK WITH BOTULINUM TOXIN

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Background

Celiac plexus block (CPB) is an interventional technique utilized for diagnostic and therapeutic purposes in the treatment of abdominovisceral pain. The celiac ganglionic plexus contains the majority of the sympathetic neurons innervating the splanchnic organs and tissues. In the animal study, celiac ganglionectomy involves surgical removal of the celiac ganglionic plexus, and has been used to study the roles of the splanchnic sympathetic innervation in cardiovascular regulation.

Methods 18-year-old male patient, who is diagnosed of uncontrolled malignant hypertension 4 years ago, is referred to our pain center from cardiologist. Four more than antihypertensive drugs are used. We performed celiac plexus block with local anesthetics (0.4% lidocaine 12cc in each side). As a result, patient's systolic and diastolic BP was dropped for a few days. We performed CPB with botulinum toxin (100 IU) to this patient. While one month observation after CPB with botulinum toxin, patient's systolic BP was controlled under 160 mmHg, diastolic BP was controlled under 100 mmHg, with the same medication in usual. We performed secondary with botulinum toxin to this patient. Until now (After 4 months), patient's systolic BP has been declined to under 160mmg and controlled well.

Result

Uncontrolled hypertension, we can expect a declining effect on patient's BP with CPB procedure. With local anesthetics, there is a short tem effect, but with botulinum toxin, we can expect a long term effect.

Conclusion

With CPB procedure with botulinum toxin, we can expect a long term effect of dropping the BP on these patients who have uncontrolled hypertension.

EFIC5-0345

Multidisciplinary pain treatments

SIX MONTHS OF TREATMENT WITH METHYLPHENIDATE AFTER TRAUMATIC BRAIN INJURY WITH FOCUS ON MENTAL FATIGUE, COGNITIVE FUNCTIONS AND SAFETY

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Background and aims: Traumatic brain injury (TBI) may cause long-lasting post-concussive symptoms, such as mental fatigue and concentration difficulties and this may become the main hindrance for TBI victims for returning to work and studies. There is currently no effective treatment for long-lasting mental fatigue. This is the first long-term intervention study with methylphenidate exploring the effects on mental fatigue, cognitive function and safety.

Methods: Thirty participants who suffered from long-term post-concussion symptoms after a mild TBI or TBI and who had reported positive effects with methylphenidate during a three months study were included in this follow-up study, and were treated with methylphenidate for a further six months.

Results: The effects on Mental Fatigue Scale (MFS) and cognitive function (processing speed, attention, working memory) were significantly improved compared to baseline data recorded before start of the whole project ($p < 0.001$). The effect after a further six months was not changed compared to the improvement reported during the first 3 months.

Conclusions: Individuals suffering from prolonged symptoms after TBI reported reduced mental fatigue and improved cognitive functions with long-term methylphenidate treatment. The effect was stable and no adverse effects were reported during the 6 months studied. It is suggested that methylphenidate can be a treatment option for long-term mental fatigue and cognitive impairment after TBI.

OUTCOME OF THE FIRST 10.000 BACK PAIN PATIENTS TREATED WITH THE INTEGRATIVE MANAGED CARE CONCEPT OF THE GERMAN PAIN SOCIETY

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Background and aims: Back pain (BP) is one of the most expensive health problems in developed countries of the western world. Despite intensive efforts to improve treatment structures and pathways, prevalence of back pain patients and related costs increase continuously. Alternative approaches, addressing patient-centred multimodal and interdisciplinary approaches beyond standard-of-care and combined pay-for-performance/results concepts offer new perspectives for a successful, rapid, sustained and cost-efficient treatment.

Methods: In 2005, the German Pain Society and a German joint venture of insurance companies, certified pain specialists, a management and an external quality control organization, developed a concept for an integrated, interdisciplinary medical treatment program for BP patients (IV-R), focussing on a rapid and sustained restoration of working abilities and related per diem indemnity savings.

Results: Until mid of 2014, 10.000 patients characterized by at least 28 days sick-leave due to BP were identified by their compulsory health insurance companies and invited to participate. Of those 7.380 patients who were finally enrolled (and for whom historical data suppose a back-to-work rate of ~30% within 12 months), 59.4% responded within four, 87.3% within eight weeks and returned fully back to work – 87.1% sustained over at least 6 months. The majority of patients showed significant and clinically relevant improvements with respect to pain-intensity as well as pain-related physical and mental co-morbidities, functional restrictions, quality-of-life, as well as disease-relevant attitudes.

Conclusions: The integrative treatment concept IV-R offers a rapid, highly and sustained effective as well as cost-efficient alternative to standard-of-care.

PREDICTORS OF OUTCOMES OF MULTIMODAL REHABILITATION IN PATIENTS WITH CHRONIC PAIN – A PRACTICE BASED EVIDENCE STUDY FROM TWO CENTERS

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Background and aims: In clinical practice is discussed if there are characteristics of the clinical presentation of the patients indicative of the outcomes of multimodal rehabilitation programs (MMRP). There are limited knowledge on predictors of MMRP's outcomes. The aim of this study, based on data from the Swedish Quality Registry for Pain Rehabilitation (SQRP), was to identify predictors of outcome of MMRPs at 12 months follow-up (FU-12).

Methods: Patients with chronic pain from two clinical departments in Sweden were included. They filled in questionnaires (background, pain characteristics, psychological symptoms, function, activity/participation, health and quality of life) of the SQRP 1) at the first visit, 2) immediately after MMRP and 3) at follow up after one year (n=227). At FU-12 the patients reported global Impression of change for the perception of pain and for the ability to handle life situation in general.

Results: Significant improvements were found for pain, psychological symptoms, activity/participation, health and quality of life aspects with low/medium strong effects. 53.6% reported improvements in pain perception and 80.1% in life situation in general. The most important regressors of these variables were high education, low pain intensity, convinced to be restored, high health level and short durations of pain (only pain perception) and sick-leave (only life situation). The explained variations were low (R^2 : 0.09- 0.11; $p < 0.05$).

Conclusions: This study representing confirmed earlier trials and systematic reviews that outcomes of MMRP is associated with broad positive effects. A mix of background and baseline variables had importance for the two outcomes investigated.

EFIC5-0368

Multidisciplinary pain treatments

BREAKING THE SILENCE: COMMUNICATION PRACTICES AND PREFERENCES AMONG INDIVIDUALS WITH CHRONIC PAIN

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Background and aims: Chronic pain sufferers have difficulty translating their abstract and subjective experiences of pain into words. Scales to quantify pain have limited success in accurately conveying the intensity and specificity of pain. Not only do patients who are unable to communicate their pain suffer from isolation and depression, but so do their spouses and children. Patients who report good communication with their providers are more likely to be satisfied with their care, better understand their problems, follow advice and adhere to prescribed treatment and behavior change. This study examines communication practices and preferences of individuals with chronic pain to better understand the way pain impacts their daily living.

Methods: 20 individuals with chronic pain participated in a six-week online writing workshop. Curriculum included reviewing cognitive frameworks to restructure metaphoric associations about pain. Participants were referred by their health care provider and were recruited via chronic pain devoted websites.

Results: Textual responses analyzed using discourse analysis revealed four themes for how individuals with chronic pain explain the impacts of living with chronic pain: the binary of revealing/concealing pain; the need to value and respect pain; the discontinuity of living with unpredictable pain; and the importance of self-care.

Conclusions Creative writing techniques have demonstrated therapeutic value for grappling with abstract, subjective experiences and may help facilitate more precise language during patient-provider interaction. Online delivery provides anonymity and convenience that is critical for marginalized and stigmatized participants and may be suitable for future pain management treatments.

EFIC5-0370

Multidisciplinary pain treatments

QUALITY OF LIFE, ANXIETY AND DEPRESSION OF PATIENTS WITH CHRONIC PAIN ASSISTED IN AN AMBULATORY DIDACTIC

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Introduction: In Brazil, pain is the reason why 75% to 80% of the population seeks health care, and chronic pain, which affects 30% to 40% of the population, is the leading cause of absenteeism, low productivity, sick leave, retirement due to illness and workers' compensation.

Objective: To evaluate patients with chronic pain in relation to quality of life, anxiety, depression and pain. **Method:** The sample consisted of 19 patients, most elderly (mean 65 years), women (80%) in the didactic clinic of the Specialization Course in Pain. Applied at the first appointment the following assessment tools: Brief Inventory of Pain (BPI), Quality of Life (SF-36), Anxiety and Depression (HAD). **Results:** For the average intensity of pain, 57% reported moderate, 36% strong and only 7% voiced mild pain. As for the impact of pain, 42% reported to have moderate impact on sleep, 36% in mood and yet, 57% of high impact at work and in interpersonal relationships. When assessing the quality of life (SF-36), the following areas presented below 50%: 84% in physical appearance, 79% in functional capacity, 73% vitality, emotional aspect respectively, and even 63% in mental health and 57% in the social aspect. Regarding the assessment of anxiety and depression, 68% were positive for anxiety, however, 57% obtained negativity and depression. **Conclusion:** The use of instruments to assess quantitatively and qualitatively the pain, promoted better understanding to students about the patient's pain, and provide discussion for treatment planning and subsequently monitor the clinical evolution of the patient in didactic clinic.

EFIC5-0371

Multidisciplinary pain treatments

FIBROMYALGIA AND SOMATOFORM DISORDER: APPROACH Transdisciplinary CASE

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Introduction: Patient female, 54 years old, diagnosed with fibromyalgia and somatoform disorder, psychiatric care, staff of pain. Start of pain for 20 years, presence of constant pain, worse with physical activity, emotional factors, improves with rest. Tip pain, tightness, overwhelming, maddening, throbbing and stabbing with location in the cervical region, bilateral mediastinal, abdominal and sacroiliac region. Have sleep apnea, loss of appetite and constipation. Psychologically has low resilience and severe psychological impairment. Was referred to a disciplinary treatment of pain with pharmacological prescription: Venlafaxine, tramadol, quetiapine, dipyrone and no pharmacological: acupuncture, psychotherapy, meditation and Pilates. **Objective:** Investigate clinical changes of a chronic pain patient in transdisciplinary approach. **Method:** report of one case the patient described and evaluation based on clinical questionnaires: SF-36, HAD, catastrophizing, BPI. **Results:** SF 36: physical aspect = 25% before and 56% current; Vitality = 10% before and 68% current; functional capacity = 0% before and 45% current; social aspect = 35% before and 55% current; emotional aspect = 0% before and 57% current; mental aspect = 22% before and 48% current. BPI: EVN media = 8 before and 2 current; impact on sleep = 8 before and 5 present; impact mood = 9 and 4 before today; impact relationships = 3 before and 2 today; impact enjoy life = 7 before and 2 today. Catastrophizing before 5.6 (POSITIVE) and today 1.1 (NEGATIVE). HAD anxiety and depression before, today only depression. **Conclusion:** The patient has great improvement in their aspects evaluated, pointing effectiveness in transdisciplinary treatment.

LIVE WITH ENDOMETRIOSIS: QUALITATIVE APPROACH OF SOCIAL MEANING INVOLVED IN CHRONIC PAIN

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Background and aims

The symptoms associated with endometriosis may have an impact on the physical well-being, emotional and social development of affected women, so it is essential to evaluate women's complaints, and give you time to express their concerns and anxieties. Because of its chronic and progressive condition, endometriosis causes symptoms that affect the daily lives of women who suffer from this painful condition, especially with regard to the isolation social.

Thinking this scenario, our goal was to investigate how endometriosis can interfere corroborating the social isolation of women living with chronic pain.

Methods

This is a qualitative study based on interviews with focus groups, where women collectively expose their pain experience. The study sample consists of women with endometriosis and chronic pelvic pain, which were selected by surgical confirmation and frequent monitoring, for at least six months, in the hospital's outpatient clinic.

Results

Twenty-nine women participated in six focus groups interviews. The central theme was social isolation that was perceived as associated with the lack of understanding on the endometriosis evolution and resignation in face of the recurrent pain symptoms, included intimacy and isolation from family and friends.

Conclusions

Women with endometriosis and chronic pelvic pain have a perception altered in relation to social isolation due of pain.

EFIC5-0385

Multidisciplinary pain treatments

PAIN MANAGEMENT AND USE OF OVER-THE-COUNTER ANALGESICS: A SOUTH AFRICAN CONSUMER SURVEY

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Background and aims: Consumer studies on the use over-the-counter (OTC) analgesics in South Africa are scarce. The primary aim of the study was to investigate the usage patterns of OTC analgesics and methods of pain management by the general public.

Methods: A questionnaire survey under general consumers in Port Elizabeth, South Africa was conducted in 2014 via convenience and snowball sampling.

Results: A total of 220 respondents participated in the study (55.9% females). The majority of respondents were aged between 18 and 24 years (n=70). Paracetamol was the preferred OTC analgesic (n=105), followed by a combination of paracetamol, codeine, caffeine and doxylamine (n=46). The average number of OTC analgesic dosage units reported to be used per month was 8 tablets/capsules. Females experienced more pain relief from OTC analgesics than males. Most respondents bought their analgesics from a pharmacy (n=137). The most common side effects experienced by respondents were central nervous system effects which included dizziness and drowsiness. The preferred non-medicinal treatment or home remedy for pain was sleep (n=72), followed by the application of heat (n=45) and exercise (n=42). However, the majority of respondents (59.6%) preferred OTC analgesics rather than home remedies (32.0%).

Conclusions: Consumers need to be encouraged to buy their OTC analgesics exclusively from pharmacies, and pharmacists need to be encouraged to counsel patients to prevent unwanted side effects and drug interactions. Pharmacists should also counsel patients on the various alternative treatment options for mild pain management in order to reduce unnecessary OTC analgesic use.

EFIC5-0390

Multidisciplinary pain treatments

PAIN IN WORDS AND PICTURES

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In March 2014 University Hospital in Osijek started a multidisciplinary all-day pain program. For four weeks patients have been learning about pain and implementing physical therapy. At the end of the program, they were asked to rate the program in range from 1(worst) to 5(best) and to describe and draw their experience of pain. Poster displays their images and expressions.

IMPAIRED EMPATHIC ABILITIES IN PATIENTS WITH COMPLEX REGIONAL PAIN SYNDROME TYPE I*H. Sohn¹, D. Lee¹, K. Lee¹, E. Noh², Y. Kim³, D. Kang⁴*¹*Department of Psychiatry, Seoul National University Hospital, Seoul, Korea*²*Department of Brain and Cognitive Sciences, Seoul National University College of Natural Sciences, Seoul, Korea*³*Department of Anesthesiology and Pain Medicine, Seoul National University Hospital, Seoul, Korea*⁴*Department of Psychiatry, Seoul National University College of Medicine, Seoul, Korea*

Background and aims: Deficits in perceiving the emotional and mental states of others are reported in patients with complex regional pain syndrome (CRPS). The aims of this study are to evaluate the difference in empathic ability between patients with CRPS type I and healthy control subjects (HCs), and assess its correlation with multidimensional aspects of pain.

Methods: Empathic ability was measured in 32 patients with CRPS and 36 HCs using the Interpersonal Reactivity Index (IRI). Psychiatric symptoms were assessed by Beck Depression and Anxiety Inventories (BDI and BAI), and quality of life by WHO Quality of Life (WHOQOL-BREF). Comprehensive assessment of pain was conducted in patient group by the West Haven-Yale Multidimensional Pain Inventory (WHYMPI).

Results: Patients with CRPS showed impaired cognitive and emotional empathic abilities compared to the HCs. Significantly lower level of perspective taking, empathic concern and higher level of personal distress on the IRI were shown in patient group. Perspectives taking and personal distress were associated with affective distress and poor quality of life in social context (BDI, BAI and WHOQOL). However, empathic concern showed positive correlation with pain severity and social support from others. (WHYMPI)

Conclusions: Impaired empathic ability, a deviation toward self-oriented distress in social cognition, was shown in patients with CRPS. This result might be the effect of chronic pain related emotional distress, or otherwise imply the central pathophysiology of CRPS. Interventions to improve emotional awareness and theory of mind would be beneficial for better social functioning in patients with CRPS.

Table 1. Basic demographics and clinical characteristics

	CRPS (N=32)	NC (N=36)	χ^2 or t	P-value
Demographics				
Age(year $\pm$ SD)	36.88 $\pm$ 7.81	33.69 $\pm$ 7.32	$t = 1.732$	0.088
Education(year) [†]	14.03 $\pm$ 2.36	15.94 $\pm$ 1.62	$t = -3.847$	< 0.001
Gender(M:F)	19:13	18:18	$\chi^2 = 0.600$	0.438
Clinical Characteristics				
Comorbid psychiatric illness(%) [†]	87.5	5.6	$\chi^2 = 46.142$	< 0.001
Duration of illness(year) ^{††}	5.28 $\pm$ 3.51	-		
OME dose(mg)	68.44	-		
(95% CI)	(40.93-104.16)	-		

†: significance of p value < 0.05

††: available data only, N=24

Table 2. Empathic ability (IRI) and psychological profile in patients with CRPS vs. healthy controls.

	CRPS(N=32)	HC (N=36)	<i>t</i>	P-value
IRI-FS(Mean±SD)	13.63±4.94	15.19±3.99	-1.447	0.153
IRI-PT	14.56±5.65	17.69±3.45	-2.716	0.009
IRI-EC	14.97±4.66	18.42±4.00	-3.282	0.002
IRI-PD	17.28±5.76	11.56±4.54	4.575	< 0.001
BDI	36.06±12.60	5.86±6.32	12.259	< 0.001
BAI	41.00±12.92	9.64±10.58	10.992	< 0.001
QOL- Psychological	7.96±2.93	14.09±2.80	-8.815	< 0.001
QOL- Social relationships	8.25±2.65	13.70±2.03	-9.574	< 0.001
QOL- Environment	9.47±3.60	13.69±2.21	-5.753	< 0.001

IRI: Interpersonal reactivity index; FS: Fantasy scale; PT: Perspective taking; EC: Empathic concern; PD: Personal distress; BDI: Beck depression index; BAI: Beck anxiety index; QOL: World Health Organization Quality of life instruments.

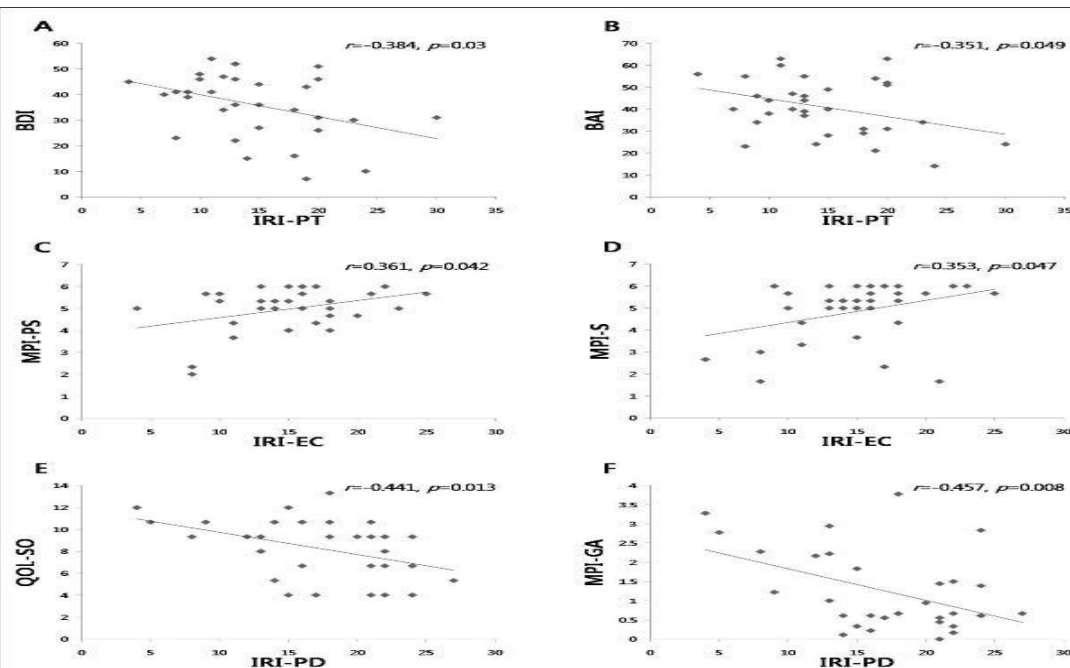


Figure 1. Correlation between IRI score and BDI, BAI, WHOQOL, WHYMPI.

IRI: Interpersonal reactivity index; PS: fantasy scale; PT: perspective taking; EC: empathic concern; PD: personal distress; BDI: Beck depression index; BAI: Beck anxiety index; MPI: West Haven-Yale Multidimensional Pain Inventory; PS: pain severity; S: support; GA: general activity; QOL: WHO quality of life instruments; SO: social relations.

EFIC5-0532

Human behavioural science: Social cognition

WE SOCIALLY EXCLUDE PEOPLE WHEN THEIR PAIN HAS NO MEDICAL EXPLANATION

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Background and aims. This study investigated whether the absence of a medical explanation for the pain is related to social exclusion of patients by observers. In addition, the moderating role of the patient's pain expression was examined.

Methods. Sixty participants (individuals from the general population) were presented with videos of 4 patients, each accompanied by a vignette describing the presence or absence of a medical explanation for the pain. Participants indicated their willingness to interact with each of the patients in different interpersonal situations (by means of the Social Distance Scales). Further, the participants were asked to select two of the four patients as a confederate to play a game against another duo in an 'independent' study.

Results. Participants were less willing to interact with the patients in different interpersonal situations when there was no medical explanation for the pain of the patients. Further, participants selected more patients with 'medically explained' pain than patients with 'medically unexplained' pain as a confederate to play the game. There was no main effect and no moderating effect of the patient's pain expression.

Conclusions. These results are indicative of social exclusion of patients with pain for which there is no clear medical explanation.

EFIC5-0168

Pain treatment (invasive): Sympathetic blocks

PAIN CONTROL PROCEDURES IN NON-RESECTABLE PANCREATIC CANCER

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Cancer of pancreas is the third most common malignancy of gastrointestinal tract cancers in Bulgaria. This cancer represents 11,6 % of carcinomas of GIT for 2008.

In 85 % of the patients admitted in an advanced stage for a surgical treatment, pain is the leading symptom. The pain can be associated with the neoplasm itself, or the metastases.

The object of our study is to present the surgical and interventional procedures used in our practice in reducing pain in patients with pancreatic cancer and to compare our results.

Material: For a ten year period (October 2004 – December 2014) were accomplished:

- 64 thoracoscopic splanchnicectomy (TCC), 30 of them bilateral, 11 at one time;
- 16 intraoperative resections of ganglion celiacum;
- 35 neurolysis of plexus celiacus under CT-control;
- 82 cases of removing pain with epidural nerve block in 10th-12th thoracic intervertebral area with an anesthetic with prolonged effect, as in 64 patients the block precedes the TCC with the purpose to have indication for accomplishing the TCC.

The estimation of pain level is done with ten-stage visual analog scale (VAS) in the day before the pain removing procedure, one, seven, thirty, ninety and one hundred days after the procedure.

Conclusions: The duration of the effect of the applied procedure depends on the stage of tumor invasion. The failure in controlling the pain is due more to wrong preoperative estimation of pain type – somatic, visceral or both, than the operative mistake. The pain recurrence is due to the biologic spread of the cancer, which leads to use of combined therapy, including interventional procedures and drugs. With best effect in reducing pain present intraoperative resection of plexus celiacus combined with bypass operation and TCC. It is necessary in the three staged strategy to be introduced a new – forth stage of interventional and surgical pain treatment.

Key words: pancreatic cancer, TCC, pancreatic pain

EFIC5-0237

Pain treatment (invasive): Sympathetic blocks

MULTIPLE LEVEL INTERCOSTALS BLOCK VERSUS PARAVERTEBRAL NERVE BLOCK FOR MANAGEMENT OF CHRONIC THORACIC PAIN

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Chronic thoracic pain is one of the most encountered problems in patients having malignancy. There are different interventional techniques for management of this pain. The aim of this work is evaluation of analgesic efficacy of paravertebral block versus multiple level intercostals block in management of chronic malignant thoracic pain and study of radiological spread of dye in both techniques putting into consideration effect on pulmonary function and haemodynamics, and sympathetic block.

This study was conducted in pain clinic in National Cancer Institute on 60 patients of both sexes having chronic thoracic pain of malignant origin on oral opioid therapy. Patients were randomly allocated into 2 groups, each group 30 patients. Group A received paravertebral single injection, whereas group B received three level intercostals block. Each group further subdivided into 2 subgroups to receive either 8 or 12 ml of bupivacaine 0.25%.

The study showed that in group A spread of dye was to 2-4 intercostal spaces with both epidural and contralateral spread whereas in group B dye was restricted to each intercostal space. Sympathetic blockade in group A lasted 16-17 hours and absent in group B. Systolic, diastolic blood pressure and heart rate were same in both groups. Pulmonary function was moderately higher in group A. There was low VAS score in group A.

Paravertebral is better than intercostals block in response to chronic thoracic pain. Paravertebral technique cannot be used as a sole technique for management of this pain.

EFIC5-0379

Pain treatment (invasive): Sympathetic blocks

**LUMBAR SYMPATHETIC PHENOLYSIS IN PERIPHERAL VASCULAR DISEASE-
OUTCOMES FROM A SINGLE CENTRE**

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Background and Objective

The objective was to assess the efficacy of lumbar sympathetic phenolysis (LSP) in patients with peripheral vascular disease and refractory rest pain who were non-responsive to conservative therapy and not suitable for surgery or angioplasty.

Methods

Retrospective data was collected from 18 patients with peripheral vascular disease underwent LSP over 4 years. Visual Analogue Score (VAS) for rest pain, sympathectomy technique details and complications were recorded. Other outcomes such as the need for vascular surgery and amputation were also recorded

Results

Good pain relief (VAS reduction >40%) was achieved in thirteen patients at 1-month follow up following LSP. Five patients failed to show any analgesic improvement. Six patients required surgery (2 amputations, 1 revascularization in both responder and non-responder groups).

Aqueous 6% phenol was used for LSP. Two levels (L2, L3) and three levels (L2-4) were targeted in 14 and 4 patients respectively. The volume of injectate was 2.5-3.5mLs per level. Three responders needed repeated LSP at 3 months, and two showed improved outcomes.

Conclusion

LSP using 6% aqueous phenol is an effective, safe and limb-saving technique for in patients with advanced peripheral vascular disease with rest pain. The patient who is a responder may need repeated procedure. Because of potential risks of spinal cord injury, ureteric damage, and genitofemoral neuralgia, this technique should be used in selected cases. There is a need of well-designed studies to define effectiveness of this procedure.

EFIC5-0044

Epidemiology, assessment, organisation of pain treatment: Epidemiology

BURDEN OF LOCALIZED CHRONIC NEUROPATHIC PAIN IN PATIENTS FOLLOWING SURGERY. RESULTS FROM AN ONGOING MULTI-CENTER TRIAL IN POST-SURGICAL NEUROPATHIC PAIN.

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Background and aims

Localized post-surgical neuropathic pain (PSNP) arises after nerve injuries and is a significant clinical problem.

Management of PSNP remains difficult, probably because single treatments do not cover all the multiple pain mechanisms involved. Therefore, there is a high unmet medical need to improve treatment.

The objective of studying demography/medical history is to gain more insight into baseline disease specifics and to learn more about the patients to be treated.

Methods

Data from an ongoing randomized, placebo-controlled trial in the treatment of PSNP were evaluated. A total of 360 patients are planned to be treated for 12 weeks. Patients are included if they have moderate to severe PSNP for ≥ 3 months.

Results

Blinded data from nearly 200 patients, thereof about 60 % females, have been evaluated. The mean age was approximately 50 years. Mean duration of PSNP was approximately 13 months. Baseline intensity of PSNP and allodynia were approximately 7 and 5 points (11-point numeric rating scale) respectively.

Surgeries that lead to PSNP were mainly knee replacement, thoracotomy and inguinal hernia repair.

Half of the patients used concomitant analgesic for PSNP, mainly antiepileptics, opioids, antidepressants and NSAIDs.

Conclusions

The trial population was representative for patients suffering from PSNP. Patients of all ages can be affected. Many patients take additional medication for PSNP and still suffer from pain. Baseline pain and duration underline the debilitating character of PSNP and burden of pain in patients affected. These results support the need for an effective, safe treatment of PSNP.

PREVALENCE OF NEUROPATHIC PAIN IN PATIENTS WITH DIABETES USING ARABIC LEEDS ASSESSMENT OF NEUROPATHIC SIGN AND SYMPTOMS IN DERNA, LIBYA

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Background

Neuropathic pain (NeP) among Diabetic is one of the most frequent complications of diabetes. There is a need to obtain data about the prevalence of NeP among diabetes patients in Libya to plan appropriate national pain management strategies. The aim of this to estimate the prevalence of NeP in patients with Diabetes and to determine the demographic factor associated with.

Methods

Physicians were asked to fill the Arabic version of Self-completed Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) questionnaire from patients with diabetes in Diabetic Unit in Derna. Pain intensity was measured using a visual analogue scale.

Results

A total of 418 patients agreeing to participate in the survey. More women were participate (n=248, 59.3 %) and took part in the survey than men (n=170, 40.7%) and the mean±SD age of the sample was 56.2±11 years. The overall prevalence of NeP among diabetes patients was estimated to be 28.2% in this population. The Proportion of females in respondent with NeP was 33%. The Mean Pain intensity ±SD was 8.3±7.8.

The prevalence of NeP increased with age, from 3.3% in the 30-39 year age group to 47.4% in the 60-79 year age group. Neuropathy was associated with duration of diabetes, and was present in 38.9% of patients with diabetes duration less than 5 years.

Conclusion

NeP is a common complication associated with diabetes. It increases with both age and duration of diabetes. There is a need to improve management of NeP with increased use of neuropathic pain drugs.

IS HIGHER OPIOID DOSE ASSOCIATED WITH BETTER FUNCTIONING OR MORE PAIN RELIEF? FINDINGS FROM THE PAIN AND OPIOIDS IN TREATMENT (POINT) STUDY

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Background: There is limited research regarding long-term outcomes of opioids for pain. The aim of this paper is to examine correlates of opioid dose, including pain relief, functioning and dependence in a sample of chronic non-cancer pain patients.

Method: Baseline data from a national sample of 1,424 people across Australia (median 58 years, 55% female and in pain for a median of 10 years), being prescribed opioids for CNCP. Current opioid consumption was calculated in oral morphine equivalent (OME) mg using a one-week medication diary. Current pain severity and pain interference were measured by the Brief Pain Inventory. Relief from pain provided by current medications was measured as a continuous score from 0% to 100%. The Pain Self-Efficacy Questionnaire was used to assess confidence in managing life despite pain.

Results: Current opioid consumption varied widely: 9% were taking <20mg OME per day, 52% were taking 21-90mg OME, 24% were taking 91-199mg OME and 15% were taking ≥200mg OME. Higher daily OME was associated with more physical and mental health issues, non-adherent opioid use, and opioid dependence. Those on higher doses reported greater pain interference and lower pain self-efficacy and less relief from their medications compared with those on 21-90mg OME.

Conclusions: Higher opioid dose was not associated with better functioning or pain relief. In addition, higher dose was associated with increased risk of problematic behaviours, and was more likely in people with a complex profile of physical and mental health problems.

PAIN IN HIGH-PERFORMANCE SWIMMERS: PHYSICAL AND PSYCHOSOCIAL ASSOCIATED FACTORS

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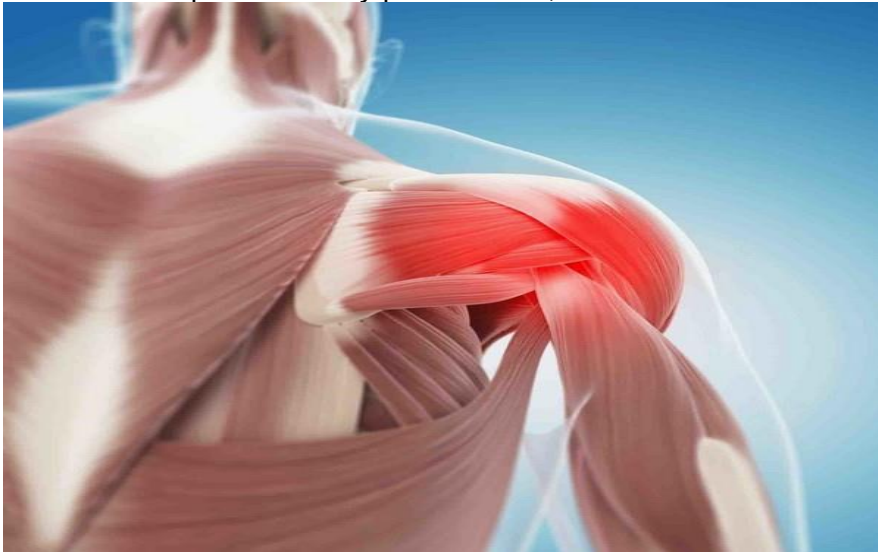
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Background and aims: High-performance swimmers spend numerous hours per week training. They are more predisposed to suffer sports-related injury and it is common to experience pain in specific parts of the body. Few studies focused psychosocial factors related to pain in elite athletes. We aim to estimate the prevalence of common mental disorders (CMD) (symptoms of anxiety and/or depression) and pain, and examine the association of physical and other psychosocial factors with the outcomes in high-performance swimmers.

Methods: Forty-two swimming athletes called up to represent Brazil in world-class championships took part in this cross-sectional study. CMD and pain were the outcomes. The association of physical and psychosocial factors – including job stress (effort-reward imbalance model) was evaluated using χ^2 test and simple logistic regression (via generalized linear models).

Results: Prevalence of CMD was of 35.7%. Prevalence of pain was of 45%. Pain occurred on 26% of the athletes on both situations: during swimming and during complementary activities. Pain was significantly different between men and women. Prevalence of job stress (effort-reward imbalance) was of 90.5%. Reward was the only facet associated to CMD. Overtraining-related subjective markers were associated to CMD. CMD were not associated to pain.

Conclusions: Psychosocial factors were not associated with pain. It indicates that the main causes of pain in high-performance swimmers are related to overuse and/or biomechanical issues. Interventions to reduce prevalence of mental health symptoms, stress and pain are essential to improve not only performance, but also health and well-being of these athletes.



EFIC5-0097

Epidemiology, assessment, organisation of pain treatment: Epidemiology

STRUCTURAL EQUATION MODELLING OF THE MODERATION EFFECT OF HEALTH LOCUS OF CONTROL ON THE PAIN-DEPRESSION PATHWAY

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Background and aims: Low back pain (LBP) is common, and is a major health concern. Psychological consequences of LBP, such as depression, are significant barriers to recovery, but mechanisms for the development of depression are less well understood. One potential mechanism is the individuals' Health Locus of Control (HLOC), i.e. perception of the level of control an individual has over their health. The aim of this study is to investigate the moderation effect of HLOC on the pain-depression pathway.

Methods: Cross sectional study of participants (n = 637) from two cohorts of primary care LBP patients. Two Structural Equation Model analysis groups were created (low perceived control, and high perceived control), based on the HLOC Internality Scale. The path model consisted of pain intensity and disability as exogenous predictors, pain interference (endogenous mediator), bothersomeness (endogenous predictor) and depression (outcome). Critical ratio difference tests were applied to the coefficients using pairwise comparisons.

Results: Both models had an acceptable model fit. Critical ratio tests indicated a significant ($p < 0.05$) moderation effect, with stronger pathway coefficients for depression for those who report low Internality (β 0.48), compared to those with high Internality (β 0.26).

Conclusions: HLOC Internality significantly moderates the pain-depression pathway in those with back pain, meaning that those who have a low perception of control report greater levels of depression. This may signify a potential factor that may predict depression among people with pain, and could potentially be a target for intervention.

Funding: Research supported by the Wellcome Trust [083572].

EFIC5-0120

Epidemiology, assessment, organisation of pain treatment: Epidemiology

THE PREVALENCE OF TRANSITIONAL VERTEBRAE IN THE LOW BACK PAIN PATIENT

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Background:

Lumbosacral transitional vertebrae (LSTVs) are a congenital vertebral

anomaly of the L5–S1 junction in the spine. This alteration may contribute to incorrect identification of a vertebral segment, leading to wrong-level spine surgery and poor correlation with clinical symptoms. We want to know the prevalence of transitional vertebrae in low back patients and in the normal group in Korean.

Methods:

We analyse lumbar AP film of 30 patients visited to our clinic who complained of low back pain and KUB of patients without low back pain

Exclusion criteria consisted of any radiologic evidence of previous lumbosacral surgery that would obstruct our measurements.

Results:

In low back pain group the prevalence of LSTV is 16/30 and 12/30 in normal group. In low back pain group, Castellvi classification type I is 6/30, type II is 10/30, type III is 0/30, type IV is 0/30. In normal group type I is 9/30, type II is 2/30, type III is 1/30, type IV is 0/30

Average age of low back pain group was 59.2, 11 people was male, and in normal group average age was 58, 13 people was male

Conclusions:

Although LSTV's role in low back pain remains controversial, our study has shown that, prevalence in the patients with low back pain is higher than normal group.

COMORBIDITIES, CHARACTERISTICS AND IMPLICATIONS IN LOCAL, REGIONAL, AND WIDESPREAD PAIN – A DESCRIPTIVE POPULATION-BASED SURVEY

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Background: Few studies investigate the total span of painspreading and its relation to implications of pain. This population-based study examined local(LP), regional (RP), and widespread pain(WSP), and compared those to people not reporting frequent pain.

Material and methods: A postal questionnaire was sent to 9000 adults, and completed by 4774.

Results: Compared to the pain-free subjects, participants with pain had lower educational levels, more comorbidities, and less physical activity. Those with WSP reported lower education, decreased health, higher prevalence of heart disease, hypertension, and diabetes, compared to those with RP and LP. Participants with WSP had more intense, frequent, and longer duration of pain, reported more medical consultations and more negative impact on work or daily chores. RP constituted an intermediate group regarding diabetes, frequency and intensity of pain, and impact on work or daily chores, while those with LP were least affected. No difference was seen between LP and RP regarding education, decreased health, duration of pain, and health care consumption. WSP had the highest proportion of women and lowest proportion of reported satisfaction with health care. No differences in marital status, physical activities, or complementary healthcare-seeking were seen between the pain categories. A substantial transition to RP had occurred at the follow-up.

Conclusions: Increased spreading of pain was clearly related to higher prevalence of heart disease, hypertension, severe pain characteristics, and negative implications of pain. The results call for future research investigating factors related to pain spreading.

HIGH PREVALENCE AND WORK-RELATED PHYSICAL FACTORS ASSOCIATED WITH KNEE PAIN IN OLDER PLANTERS

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Background and aims: Knee pain is a chronic problem for older people. Prevalence and risk factors of knee pain differ in various occupations. The aim of this study was to investigate the prevalence of knee pain and the associated factors of older adults and elderly who are all planters.

Methods: A 60-year age and older were recruited from a planter occupation who dwell in similar culture of local areas of the Khon Kaen municipality, Thailand. A total of 285 planters were selected using systematic randomization. The self-reported knee pain, work-related physical activities and other data were recorded using a face-to-face interview.

Results: The prevalent of older planters with knee pain was 54.04 % (n=154 from 285). Risking of work-related physical factors significantly associated with knee pain (odds ratio = 2.39; 95% CI: 1.06 to 5.39; p-value < 0.05). Therefore, physical activities during side sitting, standing and walking had high quantity in these samples.

Conclusions: The study shows an amount of high prevalence of knee pain in Thai planter occupation and such pain syndrome associated with high physical activity.

THE USE AND PERCEPTION OF STRONG OPIOIDS AMONG PATIENTS WITH CHRONIC NON CANCER PAIN IN POLAND

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Aim of Investigation: In Poland 27% of adult population is suffering from chronic pain. Aim of investigation was assessment of pharmacotherapy, strong opioids consuming, perception and concerns of their use in patients with chronic noncancer pain.

Methods: Anonymous online survey was conducted between 15 April and 30 June 2014 at networking site www.TacyJakJa.pl designed for Polish patients with chronic disease. The questionnaire was filled by 852 people, 72.5% of them (n = 618) identified their pain as chronic. These 618 respondents were included into the survey. The survey included questions regarding pain characteristics (reason, type, intensity, duration, impact on QoL) and pharmacotherapy, patients' satisfaction and concerns of analgesics' use. The data was evaluated statistically using Fischer and chi-square tests.

Results: Strong opioids were used by 19 (3,1% of surveyed) respondents. About 29% of patients taking strong opioids were satisfied with the analgesic treatment in contrast to these taking weak opioids - 5% of them were satisfied. Generally only 14% of respondents were satisfied with analgesic treatment. Concerns were associated with strong opioids, 31% of respondents were afraid of side effects, 38% - of addiction. In regard to weak opioids 34% respondents were afraid of side effects, and 26% of addiction.

Conclusions: The utilization of strong opioids is insufficient in Poland. Most of chronic pain sufferers don't receive adequate pain treatment with strong opioids. The presumed reasons are concerns of opioid, although patients' satisfaction with strong opioids treatment is higher than with weak opioids.

Acknowledgments: Online survey was supported by Mundipharma Polska.

PREVALENCE STUDY AND EVALUATION OF THE CARE STANDARDS FOR MIXED PAIN IN PRIMARY CARE AND ORTHOPAEDICS SERVICES IN SPAIN (EXODO)

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Background and aims:

Many patients treated in Primary Care or Orthopaedic Services suffer pain. In an important number of these patients, the pain could be classified as mixed pain due to the coexisting of nociceptive and neuropathic physiopathology mechanisms. The objective of this study is to evaluate the mixed pain in Primary Care and Orthopaedic Services in Spain. Secondary aims were localization and difficulties in pain management of these patients with mixed pain.

Methods:

A nationwide, cross-sectional study using socio-demographic and clinical data performed by 283 Primary Care and 268 Orthopaedics physicians. The presence of pain was determinate by IASP recommendations. EQ-5D and other pain scales were used.

Results:

Data from 5.459 patients were analysed; 3.220 patients had mixed pain, 1.733 patients had nociceptive pain and 499 had neuropathic pain. Main localization of pain for patients suffering from mixed pain was the back (71,74%) and lower limbs (57,10%). The causes of the neuropathic component of pain were herniated disk (41,31%) and spinal arthritis (30,42%). The maximum intensity of pain during the last week was higher in patients suffering mixed pain (7,21) and neuropathic pain (7,1). Pain relief was fair or very fair in 54,38% of the patients with mixed pain reflected also in worst results in EQ-5D dimensions.

Conclusions:

Prevalence of patients suffering from mixed pain in Primary Care and Orthopaedic Services in Spain is very high. Patients with mixed pain show higher intensity of pain and worst pain relief than patients with nociceptive or neuropathic pain limiting their QoL.

CLINICAL DECISION-MAKING IN RELATION TO PRESENCE OF JAW PAIN AND DYSFUNCTION

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Background and aims Our aim was to evaluate the clinical decision-making in relation to three screening questions for jaw pain and dysfunction (3Q/TMD).

Methods Totally, 23,409 individuals registered with the Public Dental Health service in Västerbotten, Sweden answered the questions when they attended for their routine check-up during one full year. From these, 300 patients who stated 'yes' to one or more of the 3Q/TMD (cases) and 500 who stated 'no' to all of the 3Q/TMD (controls) were randomly selected and their records were blindly evaluated. Data on diagnosis, treatment carried out, or declined treatment was extracted from the records. The statistical analysis was done with Chi-square test and logistic regression.

Results There was a fairly even distribution between men and women among controls whereas the case group had a majority of women (71%). Treatment related to jaw pain and dysfunction had been carried out for 2% of the controls and 23.5% of the cases (OR 13.6; CI, 7.1-26.2) with bite-splint therapy being the most common treatment utilized. For 6.1% of the cases the records stated that treatment had been proposed but declined by the patient. Furthermore, 13% of the cases had received treatment related to jaw pain and dysfunction free of charge.

Conclusions In this evaluation of clinical decision making related to symptoms indicative of TMD we found a relationship between an affirmative answer to a screening question and received treatment. Despite this fact, for the majority of the cases no treatment related to the symptoms was initiated.

PREVALENCE OF PAIN IN PATIENTS WITH CANCER A SYSTEMATIC REVIEW AND META-ANALYSIS: 10 YEARS LATER

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Background and aims

Almost 10 years ago we analyzed the prevalence of pain in cancer patients. This prevalence was 33% in patients who finished curative treatment, 59% in patients currently receiving anti-cancer treatment, and 64% in patients with advanced disease. Recent evidence suggests that treatment of cancer pain improved during the last decade. In view of this the aim of this review was to investigate the present status of the prevalence of pain in patients with cancer.

Methods

A systematic search of the literature published between 2005 and 2014 was performed using the following databases: Pubmed, Medline Sept, Embase Sept, Cinahl Sept, and Cochrane Trials. Study quality was assessed using methodological criteria based on Leboeuf-Yde and Lauritsen. Pooled pain prevalence (95% CI) was calculated for different patient groups. Bivariate analyses were performed to explore the relationship between prevalence and location of the study, age, and type of cancer.

Results

Out of 4117 hits we selected 122 studies of adequate quality (n=68581). Pooled pain prevalence's were 37.9% (33.9% - 45.6%) after curative treatment; 55.2% (45.9% - 64.5%) during anti-cancer treatment; 65.9% (57.8% - 74.0%) in advanced, metastatic or terminal disease; and 48.8% (37.0% - 60.7%) in studies that included all cancer stages. Moderate to severe pain (NRS $\geq$ 5) was present in 38.4% (33.0% - 43.6) of all patients. Results of the bivariate analyses will be presented.

Conclusions

Despite overwhelming attention and new developments in treatment of cancer pain the prevalence of pain in cancer patients didn't decrease during the last decade.

EFIC5-0363

Epidemiology, assessment, organisation of pain treatment: Epidemiology

PREVALENCE OF CHRONIC PAIN IN AN ELDERLY POPULATION IN SWEDEN – PRELIMINARY RESULTS

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Background and aims: The European Commission has the goal to increase the average number of healthy life years in the European Union, a goal that requires addressing chronic pain in the elderly. There is a lack of studies concerning the prevalence of chronic pain in the elderly population. The aim of this study was to investigate the prevalence of chronic pain in the population ≥ 65 years in Sweden.

Methods: A postal questionnaire was mailed to a total sample of 10 000 elderly subjects residing in the two cities in south-eastern Sweden. Data was collected by Statistics Sweden and up to two postal reminders were used. Data concerning presence of chronic pain (i.e., ≥ 3 months duration), pain intensity recent 7 days, anatomical spreading of pain and satisfaction with life in general are reported.

Results: The response rate was 66.5% (n=6611); 54% women and 46% men and with an average age of 76.2 years (65 to 102 years). 45% reported chronic pain, 8% non-chronic pain and 47% no pain; life satisfaction was best in the group without pain ($p > 0.001$). In the chronic pain group women had more widespread pain and higher pain intensity than men (both $p > 0.001$). A significant correlation existed between pain intensity and spreading of pain ($p > 0.001$). Life satisfaction in the chronic pain group correlated negatively with pain intensity, spreading of pain and age.

Conclusions: This epidemiological study found that chronic pain was prevalent in the elderly population and associated with low life satisfaction.

THE EPIDEMIOLOGY OF FAILED BACK SURGERY SYNDROME (FBSS) IN THE UNITED KINGDOM

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Background and aims: Clinical identification of Failed Back Surgery Syndrome (FBSS) is controversial and there have been few prior attempts to estimate incidence or prevalence of FBSS in Europe. We aim to fill a void in the literature by characterising the epidemiology and burden of FBSS using data from the United Kingdom.

Methods: Retrospective cohort study using the Clinical Practice Research Datalink (CPRD), a computerised database of anonymised longitudinal medical records from primary care linked with the Hospital Episode Statistics (HES) database.

Results: Using recently released data from the CPRD-HES database, we show that the incidence of lumbar surgery rose dramatically from 1.8 to 7.0 per 10,000 people in the CPRD between 1997 and 2012. Just over half were female (51.9%) and mean age at first surgery was 54.4 years (SD=15.9). Applying prior estimates of lumbar surgery failure from the literature, we expect that between 0.6-2.4 per 10,000 adults included in the CPRD experienced FBSS annually in recent years.

Conclusion: The CPRD provides linked data on lumbar surgery, medication use and therapies for pain management, making it is possible to characterise more accurately than previously possible the epidemiology of FBSS in the UK. Our results to date indicate that rates of lumbar surgery have been rising dramatically in recent years. With this, it is likely that the number of patients experiencing FBSS has also risen sharply. A better understanding of the epidemiology and burden of FBSS is needed to inform policy and practice around lumbar surgery in the UK.

HEALTH CARE COSTS AND QUALITY OF LIFE AMONG PEOPLE 65 YEARS AND OLDER WITH CHRONIC PAIN: THE CORRELATION WITH AGE

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Background and aims: Chronic pain is associated with large societal costs and extensive personal suffering, especially among the elderly. The aim of this study was to investigate the significance of age for healthcare costs and individual quality of life related to chronic pain.

Methods: A postal questionnaire was mailed to a sample of 10 000 subjects 65 years or older residing in Linköping and Norrköping, two cities in the southeast of Sweden. Questionnaires were distributed by Statistics Sweden (SCB). Data concerning health care resource uses were collected from three different registers. Respondents were categorized into age groups to find out how age among people 65 years and older with chronic pain affects health care costs and quality of life.

Results: The response rate to the questionnaire was 66.5% (n=6611); 54% were women and 46% men. Average age was 76.2 years (65 to 102 years). Among persons with chronic pain there was a clear correlation between increasing age and health care costs, especially regarding those with severe chronic pain. Health care costs were almost twice as high in the age group 85+ compared to the age group 70-74 years. The correlation between increasing age and poor quality of life was even stronger, with extremely poor quality of life among those in the 85+ group with severe chronic pain.

Conclusions: This epidemiological study found that increasing age, among people 65 years and older, with chronic pain was significantly correlated with both increasing health care costs and poor quality of life.

SEDATIVE LOAD IN PEOPLE WITH CHRONIC NON-CANCER PAIN: CORRELATES OF SEDATIVE LOAD AND ASSOCIATIONS WITH DROWSINESS AND AMBULANCE USE

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Aims: Polypharmacy is extensive in people with chronic non-cancer pain (CNCP) and many of these medications are associated with adverse effects, including sedation. The aims of this study were to: i) describe sedative load (SL) in a cohort of people with CNCP prescribed opioids, ii) assess whether SL is associated with self-reported drowsiness/fatigue iii) assess correlates of SL and; iv) assess the association of SL and ambulance use.

Methods: A total of 1,166 CNCP patients prescribed opioids were recruited from community pharmacies across Australia and completed a diary of their medication use in the past week. SL was calculated using a previously published index. Associations with SL were examined using multivariate regression, controlling for demographic characteristics, physical and mental health, substance use and total oral morphine equivalent dose.

Results: The mean SL for the group was 3.76 (S.D. 2.22) and ranged from 0-13. The most common sedative medications (in addition to opioids) were antidepressants (55%), benzodiazepines (28%) and antipsychotics (7%). SL was associated with self-reported drowsiness/fatigue. Being female, younger, unemployed, having more severe pain, anxiety/depression and a higher total oral morphine equivalent dose were associated with a higher SL. After controlling for demographic characteristics and physical and mental health comorbidities, SL was not associated with past month ambulance use.

Conclusion: Among people with CNCP, a high sedative load was associated with being younger, and having more severe pain and mental health comorbidities.

TRENDS ON OPIOID PRESCRIPTION IN SLOVENIA 2001-2014

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Background and aims: The aim of the study was to find out the trends and prescribing patterns of strong opioids in Slovenia in the years 2001-2014.

Methods: Data on opioid prescription were obtained from database of the national authorities (ZZZS). The prescription patterns for 6 strong opioids - morphine, buprenorphine, fentanyl, hydromorphone, oxycodone, tapentadol, were analysed. Data are presented as DDD/1000 inhabitants (DID).

Results:

The prescription pattern for all strong opioids, except for morphine shows upward trends. The consumption of morphine declined abruptly in 2003 when the new opioids were introduced. It was prescribed 0.088 DID of morphine in 2014, the greater part of which includes short acting formulations. This is at least ten times lower consumption than in comparable countries. All other strong opioids show steady increase in consumption, quite comparable to other countries.

It is interesting that the majority of prescriptions were issued for low doses of opioids, like buprenorphine 35 µ, fentanyl 50 µ, hydromorphone 8 mg, oxycodone 20 mg, tapentadol 100 mg. Fentanyl and oxycodone are the most frequently prescribed opioids.

Conclusions:

Approximately 23% of adults in Slovenia experience chronic pain, predominantly chronic nonmalignant pain (21%). We assume that the rise in opioid use is due to chronic nonmalignant pain.

The problem we met are lacking data on opioid users, like age, duration of treatment, cancer or noncancer pain, who prescribes opioids...

According to the constant increase in opioid prescription, detailed monitoring will be required to prevent harm and to ensure safe and correct use.

Pharmacovigilance IN A HOSPITAL PAIN RELIEF UNIT

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Introduction: It is known that prolonged use of opioids chronic non-cancer related pain (NCP) can lead to a number of adverse reactions, normally associated with gastrointestinal, central nervous system or dermatological effects. The aim was to document types and severity of adverse drug reactions of chronic opioid therapy.

Methods: A total of 650 patients NCP chronically treated with opioids (1350 outpatient visits) were evaluated using validated pain intensity and relief scales (VAS: 0-10 cm), quality of life (EQ-VAS, 0-100%), presence of adverse events (AE reported in model form to be filled by patients) and adverse drug reactions (ADR reported by physicians) and drug use, along 24 months.

Results: Our sample (mean age 63±14 years old, 67%♀, 27±6 kg/m²) shows a moderate mean pain intensity (VAS 6 cm), pain relief (VAS 4 cm) and quality of life (EQ-VAS 43%). A mean of 4-5 AEs were reported by each patients visit (a total of 6719 AEs, most common were: 12% dry mouth, 10% constipation, 9% nervousness, 7% sleepiness, 6% depression, 6% insomnia, 6% dry skin and 5% sexual dysfunctions), being reported to Spanish Pharmacovigilance System 140 ADRs (most common: 47% related to central nervous system (CNS), 15% dermatological and 13% gastrointestinal). All were predominantly mild side effects.

Conclusions: In our study, a higher prevalence of CNS ADRs was found, being gastrointestinal system ADRs significantly lower than in previous researches. Control of adverse effects is needed to conduct a proper drug prescription plan, even more, for long-term management of chronic non-malignant pain.

PREDICTORS OF PAIN 12 MONTHS AFTER HYSTERECTOMY

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Background and Aim

Aim of the study was to establish predictors of chronic pain after hysterectomy.

Methods

A prospective cohort study was performed in four Dutch hospitals. Principal inclusion criteria were age between 18 and 65 years and absence of malignancy. The following predictors were assessed: age, marital state, education level, general preoperative health (poor/moderate/good), preoperative pain (NRS 0-10), preoperative pain treatment, ASA classification, type of anesthesia, type of surgery, surgical fear (SFQ, short- and long-term aspects of surgery, both subscales range 0-40), pain catastrophizing (PCS), optimism (LOT-R), affective state (PANAS), depression (CES-D), well-being (WBQ-12), and pain at postoperative day four. Outcome measure was highest pain score (NRS 0-10) over the last week, 12 months after surgery. Linear regression analysis was performed. The multivariate model was composed of the control variables age, type of anesthesia, and type of surgery, and other predictors significant at 0.1 level in bivariate analysis.

Results

292 women were included. Median pain score at 12 month was 0 (min-max 0-9). There were 27 women (9.2%) reporting a pain score ≥ 4 . Significant predictors of pain 12 months after hysterectomy were marital state (reference living alone; Beta 0.732, p 0.019), ASA III (reference ASA I; Beta 2.109, p 0.007), preoperative pain (Beta 0.094, p 0.005), CES-D (Beta 0.041, p 0.002).

Conclusions

Women not living alone, with increased preoperative pain, ASA III, and increased preoperative feelings of depression, are at risk for chronic pain after hysterectomy.

EFIC5-0517

Epidemiology, assessment, organisation of pain treatment: Epidemiology

INCIDENCE AND RISK FACTORS OF FLIGHT-ASSOCIATED HEADACHE: A DANISH STUDY

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Background and aims: Flight-associated headache is a type of headache that presents at take-off and/or landing with characteristics including a headache often severe, usually unilateral and around the eye. The purpose of this study was to find the incidence of flight-associated headache among Scandinavian air-travelers, which has not been studied before. Characteristics and potential risk factors for development of flight-associated headache were also investigated.

Methods: An online, 14 questions-survey targeting flight passengers were developed based on known facts and available information about flight-associated headache. The questionnaire was made available through Facebook of airplane companies and communities of interest, where participants could reach it through a link, which was active between the 15th October and the 1st of December in 2014.

Results: A total of 254 responses were collected, where 89 of those individuals suffered from airplane headache (35 %). Our data showed that increasing age, history of high-altitude headache (HAH) as well as migraine was among significant risk factors for developing airplane headache ($p < 0.05$). Among other drugs, Triptans were reported (24 %) as beneficial medication to subside the airplane headache ($p < 0.05$).

Conclusion: This study revealed that around 35 % of the Scandinavian population travelling with airlines suffer from the flight-associated headache with a higher incidence in older passengers and those with a history of headache either migraine or HAH.

EFIC5-0542

Epidemiology, assessment, organisation of pain treatment: Epidemiology

PATTERNS OF ANALGESIC PRESCRIPTION ON DISCHARGE FROM AN ORTHOPAEDIC WARD AT A TERTIARY HOSPITAL

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Background and aims: Uncontrolled pain is a major impediment to postoperative functional recovery and is a persistent problem worldwide. Regarding postoperative pain after elective orthopedic surgery, there is evidence that following patient discharge, moderate to severe pain is commonly reported early on and later in the postoperative period.

Methods: We performed a retrospective investigation including all patients that underwent surgery at the Clinic for orthopedic surgery and traumatology, Clinical center of Serbia, over a 6 month period in order to determine analgesic prescription habits of orthopedic surgeons when discharging patients from the orthopedic ward. All information was gained by examining the discharge lists.

Results: Our study included 371 patients who met the eligibility criteria. The average age of our patients was 57.40 ± 20.27 years (56.33% female). 326 (87.9%) patients received no analgesic prescriptions at hospital discharge. Among patients who have been prescribed analgesic therapy (13.1%), none were prescribed opioids; NSAIDs were prescribed to 8.6 %, while analgesics were optionally prescribed to 3.5% of the patients.

Conclusions: Our results clearly show insufficient analgesic prescription by orthopedists at the time of discharge, and emphasize the need for further research, education and guidelines in this area.

OPIOID INDUCED HYPERALGESIA: IS IT CLINICALLY PREVALENT OR A RARE PHENOMENON? PRELIMINARY RESULTS OF A CANADIAN EXPERIENCE SURVEY

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Background and aims: Very little is known regarding the prevalence of Opioid Induced Hyperalgesia(OIH) therefore we undertook to evaluate the physician's) and chronic cancer pain(CCP) within their practice. We wish to identify the magnitude of this problem within current practice as well as garner knowledge regarding its identification and treatment.

Methods: After ethics approval an electronic questionnaire was distributed to physicians who work in anesthesiology, chronic pain and/or palliative care in Quebec. Results were compiled using the Survey Monkey software.

Results: three thousand questionnaires were sent and we have received 248 answers to date. Demographics show that 68% of respondents were men, 87% were anaesthesiologists, 50% had been working for 15 years or more and 65% worked in a university hospital setting. Of the 232 physicians who responded to the question, 164 (70%) said that they had "seen or suspected that a patient had developed opioid induced hyperalgesia". Overall, suspicion of OIH is low as shown in table 1. Most physicians (74.4%) did not use a clinical test to help make a diagnosis of OIH; the two main treatment modalities were NMDA antagonists (55.6%) and opioid rotation (50.3%).

Conclusions

OIH was not as prevalent as we had anticipated; more than half of physicians did not use a clinical test for the diagnosis of OIH; the treatments modalities most frequently used were the addition of an NMDA antagonist combined with lowering of opioid doses, and opioid rotation. Criteria for the diagnosis of OIH still need to be accurately defined.

EFIC5-0565

Epidemiology, assessment, organisation of pain treatment: Epidemiology

OPIOID INDUCED HYPERALGESIA: IS IT CLINICALLY PREVALENT OR A RARE PHENOMENON? PRELIMINARY RESULTS OF A CANADIAN EXPERIENCE SURVEY

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Conclusions OIH was not as prevalent as we had anticipated; more than half of physicians did not use a clinical test for the diagnosis of OIH; the treatments modalities most frequently used were the addition of an NMDA antagonist combined with lowering of opioid doses, and opioid rotation. Criteria for the diagnosis of OIH still need to be accurately defined.

IDENTIFYING SUBGROUPS OF CHRONIC PAIN PATIENTS TO DEVELOP DIFFERENT APPROACHES FOR TREATMENT

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Background

Due to the heterogeneous nature of chronic pain, it's necessary to identify patient subgroups in order to develop different treatment strategies. The aim of this study is to identify different patient groups of an inpatient multimodal pain center.

Method

The study was carried out identifying socio-demographic parameters, pain characteristics and psychological status of 445 patients (18-65 years), who should usually be available for the labour market, by using the German Pain Questionnaire before their inpatient multimodal pain treatment. The cluster-building variables (age, HADS-anxiety, HADS-depression, quality of life (SF12) and general well-being (FW7) were identified with the k-means procedure of Almo 15. The cluster-analysis was calculated with SPSS 19.

Results

We identified 3 clusters with proportions of 36%,28%,36%: "Middle-aged, less employed, distressed": patients (52±7 years) with high psychological stress, low quality of life and poor well-being. 30% of them pensioners and 45% employed. "Young, employed, distressed": Patients (42±11 years) with high psychological stress, low quality of life and poor well-being. 11% of them pensioners and 66% employed. "Middle aged, adaptive copers": Patients (50±10 years) with low psychological stress, normal quality of life and general well-being. 27% of them pensioners and 60% employed.

Conclusions

The results demonstrate, that different main aims of treatment like (re)integration into employment or improvement of coping strategies, could be a result of patients' socio-economic environment. Age and employment status appear to represent important variables in the subset of patients suffering from severe chronic pain. Further studies could clarify whether these subgroups need different treatment strategies or intensities.

CHRONIC NON-CANCER PAIN AND DISPENSED OPIOIDS: TRENDS IN THE DANISH POPULATION FROM 2000 TO 2013.

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Background and aims: Chronic pain has serious consequences for individuals and society. In addition, opioid prescription to chronic non-cancer pain (CNCP) has become more frequent. This study aims to analyze the trends regarding the prevalence of CNCP, consumption of opioids and concurrent use of benzodiazepine (BZD)/BZD-related drugs in the Danish population.

Methods: Survey data from the cross-sectional national representative Danish National Cohort Studies (2000, 2005, 2010, and 2013) were combined with The Danish National Prescription Registry at individual level. The random samples consisted of 5.000 to 13.000 individuals ≥ 16 y (average response rate 58%). Individuals completed a mailed or online questionnaire, which included the analyzed items on identification of chronic pain (≥ 6 months), socio-demographics and body mass index (BMI).

Results: Danish prevalence of CNCP increased from 18.9 % to 26.8 % and the opioid consumption from 4.1 % to 5.7 % among CNCP. Higher CNCP prevalence was related to female gender, no cohabitation partner, low education, non-western origin and overweight/obesity. In addition, women with CNCP were more frequently users of opioids and used higher doses than men. Concurrent use of BZD/BZD-related drugs decreased (13%) from 2010 to 2013, still 1/3 of long-term opioid users were co-medicated with these drugs.

Conclusions: Prevalence of CNCP and consumption of opioids have increased in Denmark. Differences regarding sex and other socio-demographic characteristics were observed. The concurrent use of BZD/BZD-related drugs has decreased in the period 2010 to 2013. These findings deserve clinical and health policy attention.

The study was supported by Helsefonden.

PREVALENCE OF NEUROPATHIC SYMPTOMS AMONG BACK PAIN PATIENTS WITH AT LEAST 4 WEEKS DISABILITY

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Background and aims: Somatic aetiology of back pain (BP) is rather complex, involving muscular, ligamentary, osseous-articular and neural structures. In general, nociceptive (NOC) as well as neuropathic components (NEP) contribute to the underlying pathophysiology. Latter ones should be adequately addressed, as they usually need a special pharmacological approach, however, mature data on their prevalence in different stages of BP is rare.

Methods: Post-hoc analysis of data from a modified neuropathic pain questionnaire (NPQ) derived from 10.000 BP patients who entered an integrated, medical treatment program after at least 28 days sick-leave due to BP.

Results: Overall, 1548 BP patients (15.5%) presented with a clinical phenomenology highly suggestive for the involvement of neuropathic structures. Average NPQ-scores were 12.2±6.5 (median: 12, range 0-35). With 23.3%, women showed a significantly higher NEP prevalence than men (17.9%) and irrespective of age, gender, BP localization or definite ICD-10 diagnosis, NEP prevalence rises both with the stage of chronification (assessed via the Mainz Pain Staging System, MPSS: stage 1 / 2 / 3: 13.3 / 20.3 / 29.2%) as well as BP severity (assessed via the von Korff grading system: I / II / III / IV: 5.0 / 11.2 / 15.1 / 22.9%). Single factor PDQ analyses revealed highest prevalence rates for lancinating pain (13.7%), followed by hypoesthesia (8.5%) and paresthesia (8.1%); lowest prevalence rates were found for mechanical and thermal allodynia (1.1 vs. 2.4%).

Conclusions: NEP is a clinically relevant (co-)factor of BP, which gains increasingly importance with duration/chronification and severity of BP.

EFIC5-0733

Epidemiology, assessment, organisation of pain treatment: Epidemiology

EPIDEMIOLOGICAL CHARACTERISTICS OF MIGRAINE IN LATVIA

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Backgrounds and aims: Migraines epidemiological characteristics vary in different regions; this study helps to clarify the patients care tasks in Latvia.

Methods: Migraine patients were selected from 3 specialized headache centers. Patient survey by phone was conducted, 40 questions on attack's character pattern, treatment and quality of life (MIDAS) were asked.

Results: Out of 116 patients aged 15 to 64 years, the age group of 25-34 (41. 4%) and women (87.9%) prevailed. 52.6% were high educated, 53.4% had a job with communicating to people. Basically headaches started at the age of 15-24 in 56.9%. Prolonged migraine attacks lasted for 13-24 h in 25.9%, 25-48h - 25.0%. Diagnosis "Migraine with aura" confirmed in 50% of the patients, mainly with visual manifestation (30.2%). Headaches were quite frequent: 4-8 times a month or more in 22.4%; 2-4 times a month -29.3%. Usually migraine was provoked by stress (58.6%), fatigue (32.8%) and sleep disturbances (22.4%). 50.9% used selective serotonin 5-HT receptor agonists for migraine attack treatment, 35.3% NSAIDs, 30.2% acetaminophen-containing medicines, 47.3% (55/116) experienced benefit from sleep, silence or shower. Majority of patients were investigated by MRI (56.0%) and CT (52.6%). The average QoL estimated by MIDAS is 8.1, it means mild disability.

Conclusions: Epidemiological characteristics of migraine in Latvia doesn't differ significantly from other European countries. Most of patients are educated, working women of childbearing age. Migraine diagnosis and treatment seems to be appropriate but despite that too many sufferers have a frequent and persistent headache attack that needs further investigation.

CHRONIC PAIN SYNDROME EPIDEMIOLOGY

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Background and Goal of Study: In a cross-sectional study of chronic pain syndrome (CPS), January, 2012 – April, 2014, we analyzed the CP characteristics in our department.

Materials and methods: At the first visit to the clinic 2521 patients individually filled in a questionnaire, developed in the CPS department and included all the analyzed parameters, which were processed with IBM SPSS Statistics and MS Excel.

Results and discussion: The most common CPSs were back pain (46.5%), headaches (22.6%) and joint pain (21.4%). Prosopalgia (5.1%), other cranial neuralgia (0.8%), neuropathic (3.1%), psychogenic pain (0.5%) were infrequent. The study included 39.6% females and 60.4% males. Most patients (76.4%) were in their working age, but were patients under 20 – 2.1%, 60 – 21.5%. The majority of them got a higher education (60.9%), were married (54.3%). The disease history was less than a month in 11.9%, 1-12 months – 32.4%, 1-5 years – 26.7%, more than 5 years – in 28.9% patients. Daily pain occurred in 95.8% patients. Previous treatment plans included medication (32.1%), massage (18.2%); manual therapy, reflexology, physiotherapy, therapeutic blockade, other treatments, 1.4% – did not receive therapy before. The most effective were medication (43%) and massage (14.2%). Pain affected productive functioning in the family in 29,3% patients, at work – 37.6%, in society – 33.1%. According to statistics pain severity virtually depends on gender, age, education level, marital and employment status and the diagnoses.

Conclusions: Every third patient admits a negative CPS impact on work, social, or family obligations.

CHANGES IN PRESCRIPTION AND NON-PRESCRIPTION MEDICATION FOR HEADACHE AND SOMATIC PAIN – EFFECT OF PRESCRIPTION REGULATORY CHANGES

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Background and Aim

The association between headache and medication use is well known especially for medication-overuse headache (MOH) where the medication may induce chronic pain. The main MOH culprits in Norway are NSAIDs and paracetamol which are available without prescription. We assessed the use of prescription and non-prescription pain-killers, for headache and other somatic pain over time. A specific aim was to assess whether the law amendment in 2003, releasing the sale of non-prescription drugs to ordinary shops, changed the use of pain-killers.

Methods

Repeated cross sectional population study with random sampling from 1998 to 2012. Questionnaires included the HSCL-25 questionnaire and additional questions on somatic pain and use of pain-killers. Data was weighted to adjust for changing response rates between the years. Statistics was mainly by logistic regression with complex samples adjustment.

Results

27,247 adults were included. Response rate declined from 73% to 58%. Reported headache prevalence decreased over the period while it increased for somatic pain. Pain medication use decreased for both prescribed and non-prescribed medication. The most severely affected headache patients did not decrease their medication consumption. For headache, the association between weekly/daily non-prescription medication frequency and severe headache was strong. The association with prescription medication was weaker. This association was weaker for somatic pain.

Conclusion

We found no evidence of increased consumption of pain medication after the regulatory change in 2003. The very strong association between prescription-free pain killers and headache suggests a need for continued observation and information of the risk of MOH.

FUNCTIONAL BEHAVIORAL AND PSYCHOSOCIAL CHARACTERISTICS OF THE OUTPATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN IN JAPAN

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Background and aims

It is proposed functional behavioral analysis and identification of psychosocial factor are needed on the physical therapy of chronic pain (IASP), however, such the comprehensive assessment is not carried out in Japan. The aim of this study is to examine the functional behavioral and psychosocial characteristics on chronic musculoskeletal pain in the Japanese outpatients.

Methods

A total of 236 outpatients were examined on the intensity and region of pain, functional behavioral (pain disability assessment scale, PDAS; Tampa scale for kinesiophobia, TSK; International physical activity questionnaire, IPAQ) and psychosocial characteristics (hospital anxiety and depression scale, HADS; pain self-efficacy questionnaire, PSEQ; pain catastrophizing scale, PCS; EuroQOL 5 dimension, EQ-5D).

Results

Mean intensity of pain was 4.8/10. There were a lot of lumbar, shoulder and knee as a region of pain. PDAS and TSK showed high values than each cut-off points. Pain intensity had a weak correlation with PDAS, TSK, HADS, PCS and EQ-5D ($r=0.397\sim0.199$). PDAS and/or TSK had a moderate correlation with HADS, PCS and EQ-5D ($r=0.633\sim0.353$). However, IPAQ had no significant correlation with the other parameters.

Conclusions

Our results suggested that the outpatients suffering from chronic musculoskeletal pain could promote a vicious circle of the pain by activity restriction and kinesiophobia as well as psychosocial factor. We concluded, therefore, the comprehensive assessment involving functional behavioral and psychosocial factors was essential on physical therapy for chronic musculoskeletal pain.

PATIENT'S PROFILE IN BELGIAN MULTIDISCIPLINARY CENTERS OF TREATMENT FOR CHRONIC PAIN

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Background and aims. Within a nationwide comprehensive pain policy, the Federal Public Service Health of Belgium has installed and support 35 Multidisciplinary Centers for Chronic Pain (MCCP) using non-invasive bio-psycho-social treatment model. This study explored the patient's profile and their care needs .

Methods. From each MCCP, 50 consecutive patients (of which minimum 25 had to be new patients) were invited to complete a questionnaire. The questionnaire assessed socio-demographic and pain characteristics, activity level, etiology, and the Multidimensional Pain Inventory (MPI) to assess the dysfunctional level.

Results. A total of 1662 questionnaires were completed. 71% were female patients. 82% was part of economic active age categories (20-60 yrs). Nevertheless, 71% is these agegroups were non-active and received alimony from the social security system. Of the new patients (n=909), only 5% reached the MCCP with a pain duration less than 6 months, even only 28% reported pain fewer than 2 years. Of these new patients, 25% (227/909) was referred by primary care but again in 70% only after 2 years.

Based upon the MPI algorithm to identify dysfunctional patients, 64,5% of patients had a dysfunctional profile. In the group of new patients dysfunction was reported in 56%, whereas in the group of patients already in therapy, dysfunction occurs in 44%.

Conclusion. This study reveals that MCCP typically recruit patients who are non-active and had pain of a long duration. In that way, opportunities for secondary prevention are not exploited. Further evaluation is needed to test the efficacy of the MCCPs.

A PROPOSAL TO IMPROVE PAIN MANAGEMENT THROUGH EDUCATION, LINKED TO PATIENT SAFETY

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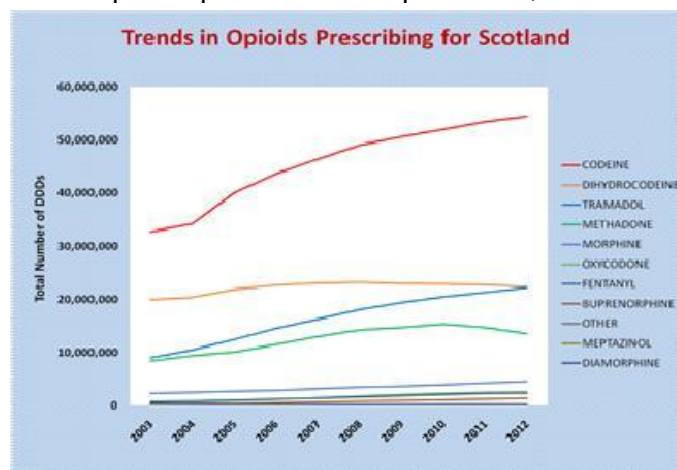
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Background: Pain is one of the commonest reasons for people to seek medical attention, accounting for around 1 in 5 GP appointments. In Scotland, 53% of patients, in the Better Together survey 2013/14, had sought advice for pain.

Despite this there is little time dedicated to pain management in Medical and other educational curricula

Objective: Patients with chronic pain attend many clinics which can result in the formation of unhelpful beliefs about pain. Investigations and treatments can expose patients to further harm such as radiation and polypharmacy. Prescribing of analgesic drugs shows a marked increase in Scotland over the last 10 years, including doubling of weak and strong opiate prescriptions and rises in prescriptions of Antidepressants, and Anticonvulsants



Methods

We will develop Healthcare Professional and public educational resources with the aims of:

1. Education on the Biopsychosocial model of chronic pain; recognition that nonpharmacological treatments are important.
2. Understanding how to assess analgesic trials to inform safe, effective prescribing.
3. Helping staff to develop skills to explain physical symptoms where no clear diagnosis can be given.
4. Understanding how to assess risk of drug dependency before initiating prescriptions.
5. Knowing how to help patients with problematic drug use.
6. Recognition of when specialist support is required.
7. Monitoring of prescribing.

Conclusions: A joint approach through NHS Education Scotland, Pain Service Improvement Groups & Patient Safety leads, supported by Scottish Government, will be developed to improve pain management, linked to patient safety.

ANALGESIC, ANTIULCER, ANTITHROMBOTIC PRESCRIPTION AND ORGAN DAMAGE: A CASE-CONTROL STUDY IN SAN MARINO REPUBLIC

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Oral medications are of paramount importance for pain treatment. Analgesics, Antiulcer and Antithrombotic drugs are oftenly co-prescribed in the older age group. NSAIDs require Antiulcer drugs to lower the risk of peptic ulcer, and potentially interfere with Antithrombotics. We performed a case-control study in San Marino Republic to evaluate the Odds-Ratios for Severe Endoscopic Gastroduodenal Damage (Gastroduodenal Ulcerative or Erosive disease-GUE), Acute Coronary Syndrome or Acute Miocardial Infarction (IHD), and presence of impaired renal function in laboratory tests (NKF classes Moderate-Severe-Terminal of CKD-EPI formula), in the population that received a prescription of the ATC classes A02B (Antiulcer), B01A (Antithrombotics), M01A (NSAIDs) in the past 90 days versus who has not received one or all that classes of drugs. Statistical evaluation has been made with parametrical methods for continuous variables. For discrete variables a chi-square test has been used. The correlation between event and drug use has been evaluated with a step-wise logistic regression. Analyzing Endoscopy group (n=1'255; GUE=491,no-GUE=764), the treatment with Antiulcer decreased the OR for GUE (OR: 0,762; CI:0,598-0,972) while Antithrombotic and NSAIDs increased the risk (OR: 1,238; CI: 0,935-1,638 and OR:1,203; CI:0,909-1,592 respectively). NSAIDs showed an increase (although non-significant) in OR for IHD patients (OR=1,464;CI=0,592-3,621). Antiulcer and Antithrombotic drugs showed significant increased risk for presence of renal failure (OR=1,369;CI=1,187-1,579 and OR=1,818;CI=1,578-2,095 respectively). No effect was shown for NSAIDs.

NSAIDs for pain therapy poses different risks of organ damage not only by itself, but even for the required parallel antiulcer prescription and the widespread co-presence of antithrombotic.

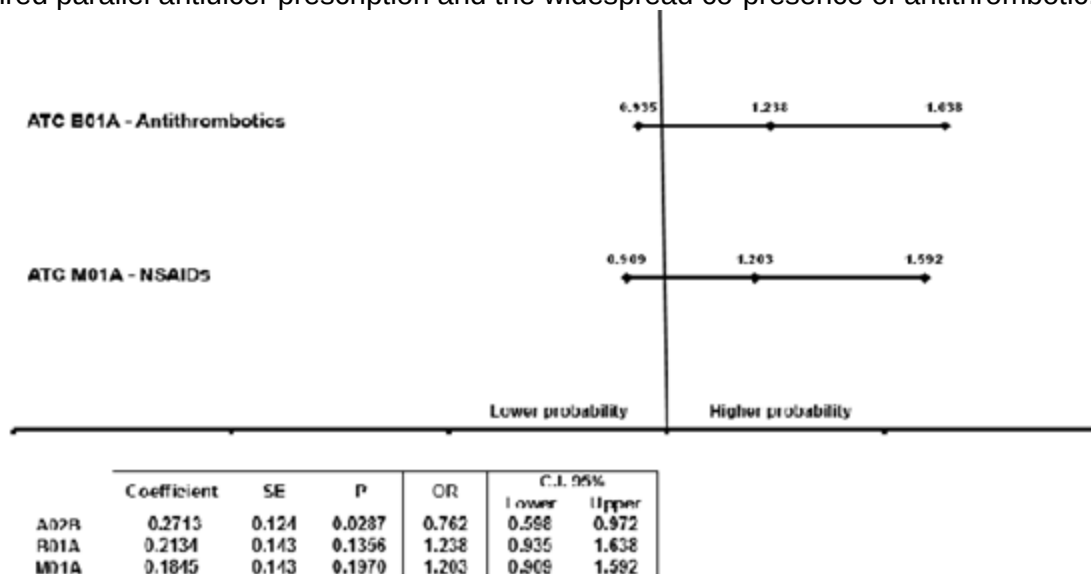


Fig. 1: Odds ratios for presence/absence of Endoscopic Erosive or Ulcerative Gastroduodenal pathology (with or without active bleeding).

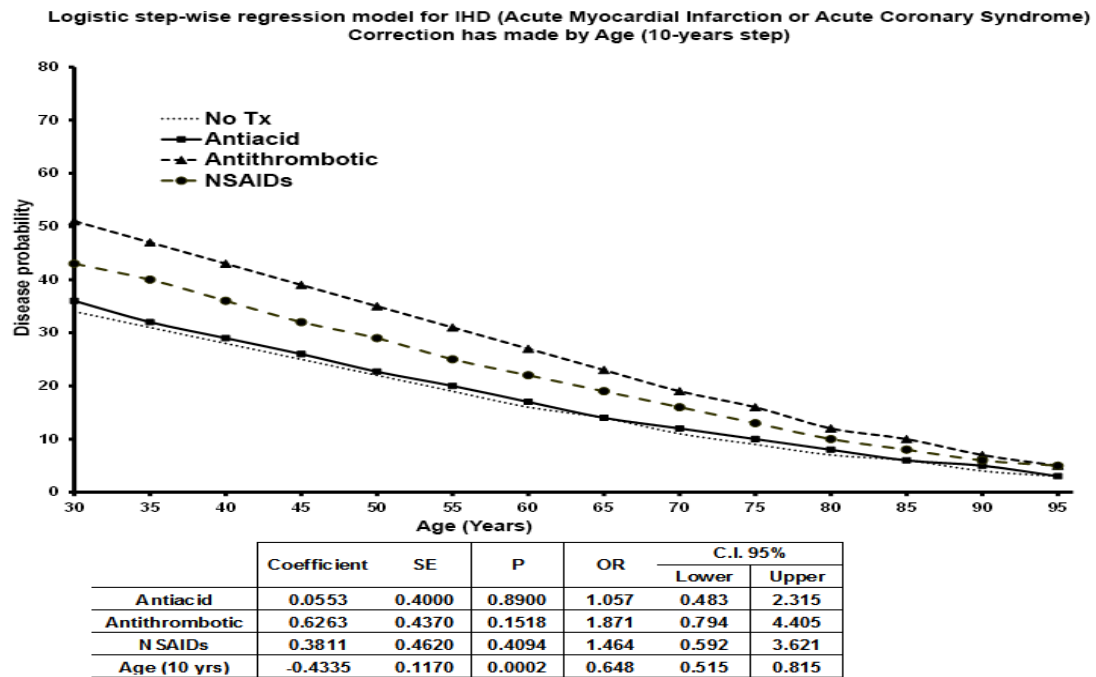


Fig.2 - Step-wise regression logistic model for IHD, adjusted for age.

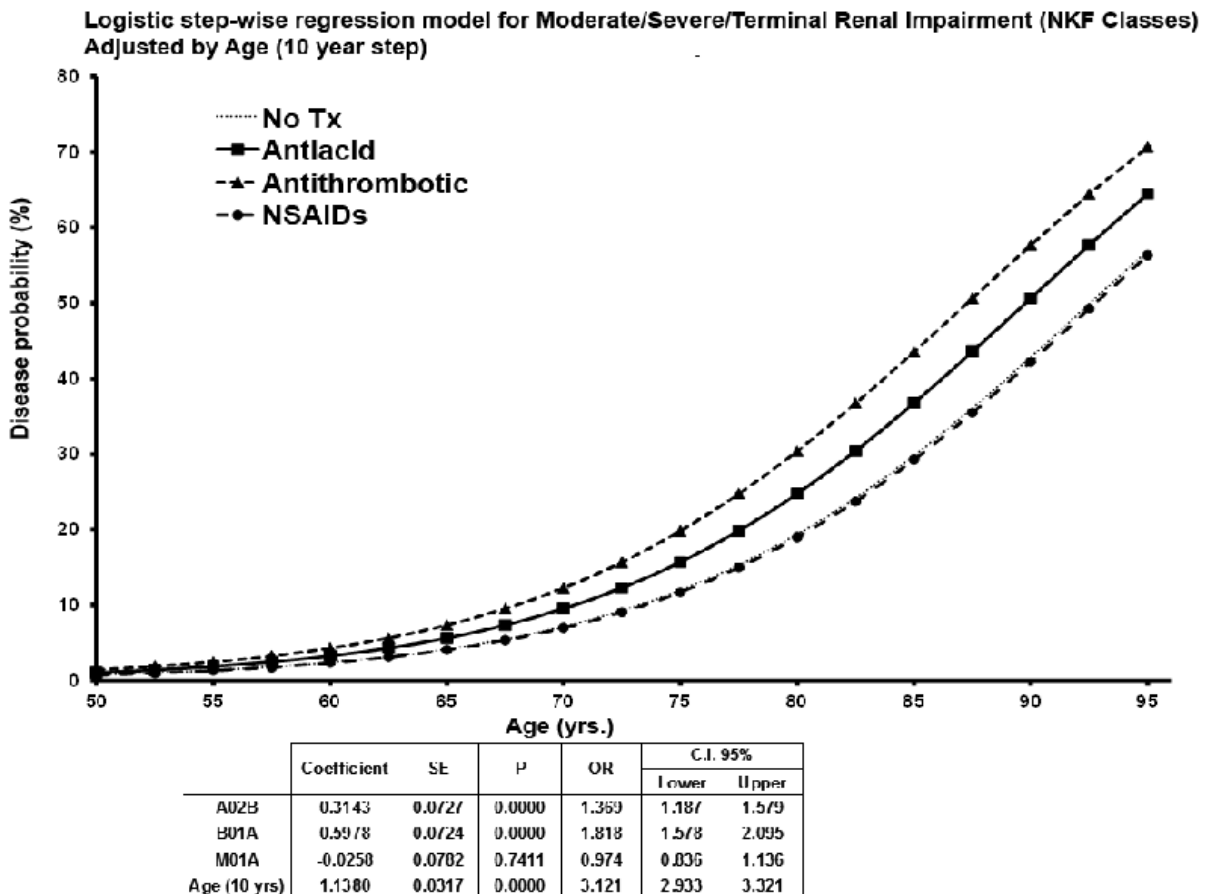


Fig.3: Logistic model for Kidney failure (adjusted for age)

MOOD AND ANXIETY DISORDERS IN FIBROMYALGIA AND IRRITABLE BOWEL SYNDROME. RESULTS FROM THE LIFELINES COHORT STUDY

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Background and aims: Fibromyalgia (FM) and irritable bowel syndrome (IBS) have often been linked to psychopathology. The aim of the current study was to compare prevalence rates of psychiatric disorders between individuals with FM and IBS.

Methods: This study was performed in 94,516 participants (mean age: 44.6 years, SD 12.5, 58.7 % female) of the general-population cohort LifeLines. FSSs were assessed by self-reports. Mood disorders (i.e. major depressive disorder and dysthymia) and anxiety disorders (i.e. generalized anxiety disorder, social phobia, panic disorder with/without agoraphobia, and agoraphobia) were assessed by means of the Mini International Neuropsychiatric Interview. Risks on psychiatric disorders were compared for individuals suffering from FM and IBS using logistic regression analyses adjusted for age and sex.

Results: Prevalence rates of FM, and IBS were 4.0%, 9.7%, respectively. Individuals with FM and IBS had significantly more mood (ORs 1.72 to 2.42) and anxiety disorders (ORs 1.52 to 2.19) than individuals without these syndromes, but prevalence rates were low (1.6 to 28.6%). Major depressive disorder was more common in FM than IBS (OR 1.58, 95%CI=1.24-2.01) whereas these groups did not differ on dysthymia or anxiety disorders.

Conclusions: Mood and anxiety disorders are more prevalent in individuals suffering from FM and IBS. However, most individuals with FM and IBS do not suffer from mood or anxiety disorders.

Acknowledgements: The authors report no conflict of interest.

EFIC5-1042

Epidemiology, assessment, organisation of pain treatment: Epidemiology

DISFUNCTION OF MYOFASCIAL RELATIONSHIPS IN THE CERVICAL REGION AND SHOULDER GIRDLE IN PATIENTS WITH ANXIETY AND PHOBIC DISORDERS

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Objective: To determine the severity of the biomechanical changes the statics and dynamics of patients with pain in the cervical region, with anxiety and phobic disorders.

Materials and Methods: The study involved 77 people with complaints of headaches, pain in the cervical spine and shoulder girdle (32 men and 45 women) aged 18 to 56 years.

Results: According to the localization of a pain syndrome in the main group cervicalgia occurred in 21.3% of patients, cervicocranialgia - at 19.1%, cervicobrachialgia - at 44.7%, mixed forms - at 14.9%. At 68.1% marked syndrome night dysesthesia of the hands: paresthesias in the fingers - from 55.3% in the wrist - at 31.9%, irradiation above the wrist - in 29.8% of patients. In the control group: cervicobrachialgia (60% cases) cervicocranialgia (16.7%) cervicalgia (23.3%). General biomechanical changes (offset common center of gravity, the difference in leg length, foot deformity, flat feet) were identified at an average of 86.7% and 40.4% of patients in the control and basic groups, respectively.

Local changes in the cervix were recorded in all patients of the main group and in 36.7% of the respondents in the control group. In the second group were more frequent voltage ladder muscles and trapezius muscles - 20% of patients), signs of neurovascular compression not identified.

Conclusion: Thus, it was possible to determine that persons with severe anxiety-phobic manifestations of local biomechanical reconstruction of the cervical region prevail over the main, and in the control group there was a reverse trend.

NECK PAIN EVALUATION WITH CONTEMPORARY TOOLS AT PRIMARY HEALTH'

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Background and aims: In this study we aimed to evaluate neck pain in adult population using questionnaires, scales and algometer. We searched for correlation between neck pain, stress, depression. **Methods:** This is the preliminary part of a wider randomized cross sectional study about neck pain in Primary Health. The sample consisted of 71 people who visited the Health Center of Evosmos in Thessaloniki, with and without neck pain using Numeric Rating Scale (NRS), Electronic Von Frey algometer, the Neck Disability Index (NDI) and the Hospital Anxiety Depression Scale (HADS).

Results: We used K independent sample test to find that stress was significantly related to frequency of pain ($p=0,007$) but was not related to depression ($p=0,508$) or disability ($0,068$). Pain threshold was estimated with algometer and NRS was also used to evaluate neck pain 'right now' from 0 to 10. We calculated pain threshold using pressure at 6 points at the area of neck with the algometer. The median of pain threshold produced by algometer was found to be negatively correlated to the number of pain declared at NRS using Spearman's rho Correlation test ($-0,256$).

Conclusions: Neck pain is related to stress but not to depression and disability. The correlation between NRS and algometer was negative but medium. This shows that people with low thresholds of pain show higher levels of pain at neck area but this relation is not very strong. More research is needed to strengthen the evidence of use of algometer as an objective tool to evaluate pain.

PREDICTING PAIN AND DISABILITY OUTCOMES IN HIGH-PERFORMANCE ATHLETES USING THE ENDURANCE-AVOIDANCE APPROACH

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Background and aims. Athletes reveal a substantial prevalence of low back pain (LBP) which is comparable to non-athletes. Pain coping strategies such as fear-avoidance or endurance are known to be positively correlated with pain and disability in non-athletic LBP patients. Despite high levels of physical activity and pain-endurance in athletes, little is known about the relation between avoidance-endurance pain responses and pain outcomes.

Methods. In a cross-sectional study, 160 high-performance athletes with LBP completed the Beck-Depression Inventory, the Avoidance-Endurance-Questionnaire, as well as the Chronic Pain Grad Questionnaire. Bivariate correlations and hierarchical multiple linear regression were calculated to determine the relationship between psychosocial pain responses and both outcomes.

Results. Fear-avoidance variables as well as endurance-related responses correlated with both outcomes. Behavioral endurance and physical exercise in hours were not correlated to pain outcomes. In the multivariate models, disability was best predicted by age, gender, help-and Hopelessness and avoidance of social activities ($R^2=35$). Regarding pain, help-and hopelessness and anxiety/depression were significant predictors ($R^2=.26$).

Conclusion. In high-performance athletes with LBP, anxious and depressive mood, cognitions of help- and hopelessness and avoidance behavior remained as the most important predictors of pain outcomes. In contrast to non-athletic LBP patients, endurance-related pain responses do not seem to play a significant role in the maintenance of pain and disability. Given the high levels of physical activity in this group, this result needs further exploration. The cross-sectional design of this study leaves unclear whether fear-avoidance coping is cause or consequence of pain experience in high-performance athletes.

LONGITUDINAL COMPARISON OF AVOIDANCE- ENDURANCE MODEL SUBGROUPS AFTER A TRAINING INTERVENTION

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Background and aims:

There is evidence that chronic low back pain (cLBP) patients with avoidance-endurance behavior face a higher risk of treatment failure and pain maintenance. The aim of this study was to investigate the impact of avoidance-endurance model (AEM) subgroups on the treatment outcome of cLBP patients.

Methods:

137 cLBP patients were investigated before and after a 6 month training rehabilitation. Patients completed the Roland-Morris disability questionnaire, Pain Disability Index, 36-Item Short-Form Health Survey, Avoidance-Endurance Questionnaire, visual analog scale pain ratings, and performed maximum back extension tests. Outcome variables were pain intensity, disability, quality of life, back extensor torque, and avoidance-endurance behavior. The statistical methods we used include cluster analysis, chi-square tests, and mixed effect models.

Results:

24% of the patients were classified as fear-avoiders (FAR), 17% as eustress-endurers (EER), 34% as distress-endurers (DER) and 25% as adaptive responders (AR). After the intervention patients of all subgroups significantly improved in their pain and disability levels, quality of life and back extensor torque. However, FAR and DER still reported significantly lower quality of life and higher levels of fear-avoidance or endurance behavior than the other subgroups.

Conclusion:

Whereas 6 months of training led to improved bodily performance in all cLBP patients, 2 out of the 4 AEM subgroups still demonstrated inferior quality of life and negative psychological behavior patterns. Thus, rehabilitation outcome in FAR and DER could likely be optimized if interventions intended to improve quality of life and to reduce avoidance-endurance behavior were added to the treatment program.

DEVELOPMENT OF AN ACTIVITY PATTERNS SCALE

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Background

Six activity patterns were identified using several self-report measures in participants with chronic pain: Pain Avoidance, Activity Avoidance, Task Contingent Persistence, Excessive Persistence, Pain Contingent Persistence, and Pacing (Kindermans et al., 2011). It has been proposed that instruments assessing pacing should include items which address three specific pacing behaviours (breaking tasks into smaller pieces, taking frequent short rests, and speeding up or slowing down) each of which have a single goal (increasing activity level, conserving energy for valued activities, or reducing pain) (Nielson et al., 2013).

The aim of this study was to develop an instrument to assess the activity patterns identified by Kindermans et al. (2011). The instrument included three pacing scales, one for each of the aforementioned goals.

Methods

A sample of 229 patients with fibromyalgia and 62 patients with other rheumatic diseases answered online versions of the instrument and the “Patterns of Activity Measure-Pain”.

Three alternative factor structures were tested by confirmatory factor analyses using structural equation modelling.

Results

The structure with the best fit had 8 factors corresponding to the hypothesized scales: Pain Avoidance ($\alpha=.60$), Activity Avoidance ($\alpha=.60$), Task Contingent Persistence ($\alpha=.81$), Excessive Persistence ($\alpha=.84$), Pain Contingent Persistence ($\alpha=.70$), Pacing for increasing activity ($\alpha=.76$), Pacing for conserving energy ($\alpha=.72$), and Pacing for reducing pain ($\alpha=.65$). High correlations in the expected direction were found between the hypothesized scales and the “Patterns of Activity Measure-Pain”.

Conclusions

The instrument showed adequate reliability and structural validity. According to the results, Avoidance, Persistence, and Pacing appear to be multidimensional constructs.

PREDICTING LONG-TERM DISABILITY IN A SAMPLE OF PATIENTS WITH BACK PAIN: A 2-YEAR PROSPECTIVE FOLLOW-UP STUDY

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Background and aims

The predictive power of the Fear-Avoidance Model is well established although further research is needed on the sequential interrelationships among its variables and the role of resilient factors. This paper presents a 2-year prospective follow-up study with the aim of investigating whether back-pain-related disability was predicted by the following variables which were measured when back pain was acute: the initial level of pain-related Disability; Perceived Pain Intensity; Depression; Fear-Avoidance Beliefs; Anxiety Sensitivity, Resilience and, Experiential Avoidance. With the same aim, two time-variant variables were measured when pain was chronic: Pain Fear-Avoidance and Chronic Pain Acceptance.

Methods

A sample of 95 patients treated in five primary care centres was assessed five times: when the patients were having an acute back pain episode and at 6, 12, 18 and 24 months. Multilevel regression models were performed via SAS.

Results

Pain-related Disability over 2 years was significantly predicted by the level of Disability and Fear-Avoidance Beliefs at pain onset, as well as by changes in Pain Fear-Avoidance at the time of the different measurements.

Conclusions

The results highlighted the predictive power of the Fear-Avoidance Model. According to the results, Pain Fear-Avoidance — composed of Pain Catastrophizing, Pain Vigilance, and Pain Anxiety — significantly predicted Disability over time. Also, initial functional disability played a more prominent role than pain intensity in the transition from acute to chronic pain. These results showed that non-psychopathological fear-avoidance beliefs grounded in the social health culture can account for disability across time.

DIFFERENCES IN NORMALIZED BACK EXTENSOR TORQUE AND INTERVIEW DATA BETWEEN AVOIDANCE-ENDURANCE MODEL SUBGROUPS

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Background and aims:

To investigate the differences in normalized isometric back extensor torque, interview data, functional health, and disability between subgroups of chronic low back pain (cLBP) patients classified according to the avoidance-endurance model (AEM).

Methods:

137 outpatients with cLBP completed the Roland-Morris disability questionnaire, Pain Disability Index, International Physical Activity Questionnaire, 36-Item Short-Form Health Survey, Avoidance-Endurance Questionnaire, and rated their pain levels on a visual analogue scale. Psychosocial stressors (family, work-related stress, mental suffering) were assessed by clinical psychologists in semi-standardized interviews. Maximum hand grip tests and maximum back extensor torques completed the assessment. The statistical methods included cluster analysis, chi-square tests, and ANCOVA.

Results:

24% of the patients were classified as fear-avoiders (FAR), 34% as distress-endurers (DER), 17% as eustress-endurers (EER), and 25% as adaptive responders (AR). Subgroups differed significantly in their quality of life, level of disability, and avoidance-endurance behavior. Interview data revealed that FAR demonstrated significantly more mental suffering and family stressors than the other subgroups. In addition, FAR, DER, or EER complained about higher work-related stress compared to AR. Maximum back extension torque normalized to maximum hand grip strength was unanimous between subgroups.

Conclusion:

Results suggest that psychological findings rather than impaired muscle strength seem to determine the different subgroups of the AEM. Mental suffering, family stressors, work-related stress of FAR, DER, or EER could play an important role for pain development and maintenance. The findings imply the demand for subgroup-tailored psychological interventions in addition to a physical empowerment of these patients.

EFIC5-0491

Pain treatment (psychological): Partner assisted treatment

HELPING MOTIVATION AND THE WELL-BEING OF CHRONIC PAIN COUPLES: A DAILY DIARY STUDY

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Background and aims: It is not clear yet why some partners of patients with chronic pain are more distressed than others. As partners may be a primary source of social support for patients who struggle with daily pain, it may be relevant to consider *why* partners provide help. Grounded in Self-Determination Theory, the present study examined the association between day-to-day fluctuations in partners' type of helping motivation (varying from autonomous or volitional motives to controlled or pressured motives) and different partner and patient outcomes.

Methods: Sixty-one couples, of which one partner had chronic pain (72.13% female patients), completed a diary for 14 consecutive days. Daily helping motivation was assessed together with daily positive and negative affect and the amount of conflict. Partners ($M_{\text{age}}=54.48$) also reported on daily helping exhaustion, while patients ($M_{\text{age}}=54.13$) reported on pain intensity, daily satisfaction with received help, disability and indebtedness.

Results: Multilevel analyses revealed both within (28.48%) and between (71.52%) person variation in partner's helping motivation. Partners' daily autonomous, relative to controlled, helping motivation related positively to partners' positive affect and negatively to partners' negative affect, relational conflict and helping exhaustion. Moreover, it also related positively to patient-reported positive affect, satisfaction with received help and negatively with patient-reported relational conflict. No associations were found with patient's negative affect, disability and indebtedness. Analyses were controlled for the amount of interaction during the day and patient's pain intensity.

Conclusions: These findings suggest that reasons why partners provide help are important for both partner's and patient's daily well-being.

EFIC5-0240

Epidemiology, assessment, organisation of pain treatment: Assessment (Quantitative Sensory Testing)

QUANTITATIVE SENSORY TESTING IN POSTSURGICAL NEUROPATHIC PAIN

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Background and aims: Quantitative sensory testing (QST) is a test used to characterize the phenotype of patients suffering from neuropathic pain. Our objective is to compare the items of the QST protocol we use between the sides (healthy and unhealthy) of patients suffering from Postsurgical Neuropathic Pain (PNP) in order to know which fibers are affected.

Methods: Descriptive and cross-sectional study performed in our hospital where we collected the QST values of our patients suffering from PNP after giving informed consent.

The variables analyzed are age, sex and all of the QST protocol in our centre which is based in the one used by German Research Network on Neuropathic Pain (DFNS) .

We performed the test in our patients and compare the results between the healthy and the unhealthy side of all of them.

We used the t of student test as comparison test considering a level of significance $p < 0.05$. We used SPSS 15.0 software for the statistical calculation.

Results: We found statistically significant differences between the cold and warm detection threshold, cold pain threshold, paradoxical heat sensations, thermal sensory limen, mechanical detection threshold, mechanical pain threshold, vibration detection threshold and pressure pain threshold.

Conclusions: We find differences in the sensation of the patients according to the side (healthy or unhealthy) that we are testing. These differences allow us to conclude that the fibers affected in the harmed side of the patients are A δ , C, A α and A β .

EFIC5-0373

Epidemiology, assessment, organisation of pain treatment: Assessment (Quantitative Sensory Testing)

WITHIN AND BETWEEN DAILY SESSION RELIABILITY OF COMPUTER-CONTROLLED PRESSURE CUFF ALGOMETRY

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Background and aims: Computer-controlled cuff pressure algometry (CPA) can be used to determine the pressure pain detection threshold (PDT), pressure pain tolerance threshold (PTT), spatial summation (SS), temporal summation of pain (TSP), and conditioning pain modulation (CPM). The aim of this study was to investigate within and between daily session reliability of CPA.

Methods: Twenty healthy male volunteers participated in two identical sessions, morning and afternoon, in one day. In each session the pain profile (PDT, PTT, SS, TSP, CPM) was measured three times repeatedly with short interval. The pneumatic tourniquet cuff wrapped around the lower leg was automatically inflated and the subject was instructed to continuously rate the pain intensity on the electronic visual analogue scale. The within session reliability was assessed by intra-class correlation coefficients (ICC[3,1]). Absolute reliability was examined by limits of agreement (LoA) and coefficient of variation. For between session reliability, ICC[3,k] and LoA were investigated. Repeated measures ANOVA was adopted for examining between session difference.

Results: All ICCs of within and between daily sessions showed fair to good, or excellent reliability. Except CPM, no significant differences were found between sessions (ANOVA: $P > 0.14$). Even though between daily session ICC of CPM showed good to excellent reliability, evaluation revealed the value of CPM in the afternoon session was lower than the morning ($F(1,15)=8.764$, $p=0.010$).

Conclusions: CPA showed good within and between session reliability in all pain profiles. Interestingly, the afternoon CPM efficacy was decreased compared with the morning assessment.

QUANTITATIVE SENSORY TESTING IN POSTHERPETIC NEURALGIA

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Background and aims: Quantitative sensory testing (QST) is a test used to characterize the phenotype of patients suffering from neuropathic pain. Our objective is to compare the items of the QST protocol we use between the sides (healthy and unhealthy) of patients suffering from Postherpetic Neuralgia (PHN) in order to know which fibers are affected.

Methods: Descriptive and cross-sectional study performed in our hospital where we collected the QST values of 14 patients suffering from PHN after giving informed consent.

The variables analyzed are age, sex and all of the QST protocol in our centre which is based in the one used by The German Research Network on Neuropathic Pain (DFNS) .

We performed the test in our patients and compare the results between the healthy and the unhealthy side of all of them.

We used Student's t-test as comparison test if they distribution was normal or the Mann-Whitney U test if the distribution was non-normal considering a level of significance $p < 0.05$. We used SPSS 15.0 software for the statistical calculation.

Results: We found statistically significant differences between the cold detection threshold (CDT) and pressure pain threshold (PPT).

Conclusions: The differences that we have found in PPT and CDT between the healthy and unhealthy sides allow us to conclude that the fibers damaged in the ill side are Ad and C.

EFIC5-0606

Epidemiology, assessment, organisation of pain treatment: Assessment (Quantitative Sensory Testing)

PARKINSON'S PATIENTS DEMONSTRATE AN ALTERED SENSORY AND PAIN PERCEPTION

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Background and aims: Parkinson's disease (PD) is a progressive neurodegenerative disease generally occurring above the age of 60, and primarily presents as a motor system disorder. Impairment of the sensory system has been less-explored. We investigated PD patients sensory and pain perception in response to non-painful and painful stimuli and potential effects of PD medications on the responses.

Methods: Twelve PD patients (9M, 3F; 68.67±5.5 years) and 12 healthy subjects (8M, 4F; 67.5±5.39 years) were recruited for this study. The participants were tested in forearms, low back, and hands to investigate the sensory perception and pain responsiveness to light brush, pinprick, cold pressure test (CPT), and pressure algometry.

Results: PD patients presented a general higher sensitivity towards the applied stimuli. A significant difference was found in response to brush ($P<0.05$) and pinprick ($P<0.001$) tests compared with healthy subjects independent of the test regions. PD patients had shorter tolerance to CPT ($P=0.016$) and a lower PPT both before ($P=0.011$) and after ($P=0.050$) the CPT. Alterations in sensory perception was independent of the PD medications.

Conclusion: The present study confirmed the presence of sensory disturbances in PD patients in comparison with healthy subjects that might be due to impairment of the central dopaminergic system or peripheral pathways involved in sensory perception and pain. However, a larger scale study is required to confirm these results.

EFIC5-0754

Epidemiology, assessment, organisation of pain treatment: Assessment (Quantitative Sensory Testing)

CAN REGISTERED SURGICAL NURSES' OPIOIDS USAGE HELP THEIR PATIENTS WITH PAIN?

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Background – Aim: Surgical nurses' have to face pain as one of the most frequent symptoms. Especially post-operative patients complain about the fifth vital sign in a few days after surgery. Nurses, as health care professionals, are obliged to alleviate the pain. For pain management, nurses use opioids commonly to manage severe acute pain which occurs after surgery. This paper's aim was to show how surgical nurses record their patients' pain and their necessity of opioids.

Methods: Surgical nurses, who work in Trakya University Health Research And Application Center, constituted this study's universe (N=145). After receiving permission from the hospital management, data was gathered through a questionnaire between the dates January – February, 2015. The questionnaire had 2 vignettes about 2 post-operative patients who were the same except their behaviors.

Results: The nurses' (n=102, 70.34%) mean age was 30.86±6.57 and the mean of occupational experience was 9.25±6.83 years. Nurses pointed out that 46.5% of them used tramadol as the most frequent opioid ordered in clinics and 35.4% of them stated antipsychotic drugs instead of opioids incorrectly. In the questionnaire's first vignette, 12.7% of nurses recorded patient's self-report pain score while 47.1% of them recorded self-report pain score in the second one. Respectively, 68.6% and 33.3% of nurses refused to inject more morphine to their patients in both vignettes.

Conclusion: The results showed that surgical nurses were influenced by the patients' behaviors and inadequate to alleviate the pain because of the lack information about opioids usage.

LONG-TERM TEST-RETEST RELIABILITY OF QUANTITATIVE SENSORY TESTING (QST) IN HEALTHY PARTICIPANTS

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Background & Aims. Quantitative sensory testing (QST) is a diagnostic tool for the assessment of somatosensory changes. In order to establish QST as an outcome measure for clinical trials, in particular for musculoskeletal disorders, knowledge about its long-term reliability is crucial [1]. Therefore, the long-term reliability of the standardized QST protocol of the German Research Network on Neuropathic Pain (DFNS) was tested.

Methods. 22 healthy volunteers, 10 males (38.2 ± 13.1 years), 12 females (54.3 ± 6.9 years), were investigated. The unilateral lower back and hand dorsum (dominant hand) were tested. Each subject participated in two QST sessions separated by 10.0 ± 2.9 weeks, a time period, which corresponds to the duration of a typical intervention for back pain episodes. Intraclass correlation coefficient (ICC) < 0.40 was considered as poor, 0.40 - 0.59 fair, 0.60 - 0.74 good, and > 0.75 excellent [2].

Results. Excellent ICC was observed for Heat Pain Threshold (back, hand) and Mechanical Pain Sensitivity (back). Good ICC was observed for Warm Detection Threshold (hand), Mechanical Pain Sensitivity (hand), Vibration Detection Threshold (back, hand), and Pressure Pain Threshold (back, hand).

Conclusions. Our results indicate that most parameters of the QST are reliable over a time period of 10 weeks in healthy participants. Therefore, the utilized QST protocol may be a suitable outcome for treatment trials. However, attention must be paid how to interpret each subtest.

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THE VALUE OF QUANTITATIVE SENSORY TESTING (QST) IN DIAGNOSING NEUROPATHIC PAIN – PRELIMINARY RESULTS

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Introduction

Quantitative Sensory Testing(QST) is a non-invasive method of examining the sensation and pain thresholds for cold and warm temperatures. The aim of our study is to evaluate the diagnostic value of QST in neuropathic pain.

Methods

QST is performed in a quiet environment of neutral temperature(22°C). The test is performed on the painful and the respective non-painful side, using a 5x5cm thermode. The sensation threshold for warm and cold is evaluated first, followed by the pain threshold for warm and cold. Base temperature is set at 32°C and the rate of change is 1°C/sec. To protect the patient, the thermode temperature cannot exceed 50°C or drop below 5°C.

Results

So far 17 patients with neuropathic pain have been studied(53% females, mean age 63.2 years). Of them, 9 had post-herpetic neuralgia, 5 trigeminal neuralgia, 1 sciatica, post-traumatic pain and 1 central neuropathic pain.

Cold sensation threshold(A δ fibers) was significantly higher in the painful side(25.7 vs 29.5°C, $p=0.011$). Warm sensation threshold(C fibers) was also higher in the painful side(37.3 vs 35.8 °C, $p=0.011$). Cold pain threshold(combination of A δ and C fibers) was lower in the painful area(20.2 vs 15.2 °C, $p=0.028$), when no statistically significant difference was found regarding the warm pain threshold(mainly C fibers) between the two sides.

Conclusions

Our preliminary results confirm differences in QST that have been observed in other case series. We intend to recruit more patients, with neuropathic and nociceptive pain, so to evaluate the value of QST in diagnosing neuropathic pain, in combination with the DN4 questionnaire.

EFIC5-0030

Pain treatment (conservative): Headaches

USE OF THE NON-MEDICATION IN THE TREATMENT OF TENSION-TYPE HEADACHE

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Background and Aims: The effect of the complex (acupuncture, d'arsonval currents and variable magnetic field) on the pain intensity of the patients having tension-type headache was investigated.

Method: 80 patients aged from 18 to 55 (51 females and 29 males) having tension-type headache were observed. The pain was examined and measured according to the visual analogue scale (6 -7 points). All patients were observed (MRI, doppler ultrasound vessels of the head and neck, spondylography etc.)

The patients were divided into two groups. The first group (62 patients) received in addition their basic medication and complex: acupuncture (GI 4, GI 11, E 36, RP 6, P7, MC 6, TR 5, F 2, IG 3, T 12-18, T 20, IG 10, IG 12-15, GI 14-16, V 7-15, VB 19-21, VB 3-9, TR 17, TR21-23, VB1, V 2-6, VB 14-16, T 22-24); variable magnetic field to the neck paravertebrally and d'arsonval current on the scalp and neck and neck and shoulder region. The complete course was 10 - 12 procedures. The second group (control, 18 patients), received only the basic medication.

Result: The pain intensity of the patients in the first group was reduced after 6 - 7 days of treatment (96,7% patients) compared to the control group, where pain reduction after 12 - 16 days of treatment (44,4% patients); $p < 0,01$.

Conclusion: The addition of the acupuncture, variable magnetic field and d'arsonval current to the treatment of tension-type headache resulted in earlier remission.

EFIC5-0035

Pain treatment (conservative): Headaches

COMPARATIVE ASSESSMENT OF CAFFEINE VS. KETOROLAC INTRAVENOUS ADMINISTRATION EFFICACY IN ACUTE MIGRAINE HEADACHES WITHOUT AURA

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Background and aims: This study was aimed to compare the effect of intravenous injection of caffeine vs. Ketorolac in pain management of common migraine sufferers in the ED.

Methods: Patients referred to the ED with acute migraine headache without aura, determined based on the last criteria of DSM IV, underwent double-blinded injection with 60 milligram Caffeine or Ketorolac, intravenously. Their headaches were recorded according to Visual Analog Scale (VAS) before and after 1 hour, and 2 hours from drug administration. 30 millimeters change in VAS was considered as a positive response to treatment.

Results: In the present study 110 patients were equally categorized in to two receiving groups of Caffeine and Ketorolac (59.1% female). The mean of pain severity before therapeutic intervention were 8.4 ± 1.5 in both groups ($p=0.96$). After one hour from drug administration, their pain severity mean were 5.4 ± 2.4 and 4.9 ± 1.9 in Caffeine and Ketorolac group, respectively ($p=0.23$). After 2 hours, the mean of pain severity were 3.5 ± 2.6 and 3.5 ± 2.1 in Caffeine and Ketorolac group, respectively ($p=0.49$).

Conclusion: Both Caffeine ($p<0.001$) and Ketorolac ($p<0.001$) cause significant pain relief after the first and second hour from therapeutic intervention. There is no significant difference in therapy success between both drugs for reducing the pain in the first ($p=0.42$) and second hour ($p=0.59$). It seems that intravenous Caffeine citrate can be as effective as Ketorolac in pain management of patients suffering from migraine without aura.

EFIC5-0923

Pain treatment (conservative): Headaches

LOCAL ANESTHETIC TOXICITY IN G6PD DEFICIENCY SUFFERERS AFTER TRIGGER POINT INJECTION

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Background:

Glucose-6-phosphate dehydrogenase (G6PD) deficiency is an X-linked genetic defect arising from mutations in the G6PD gene which predisposes to hemolysis in response to a number of triggers including certain food and drugs.

Methods:

A 44 years old female patient with G6PD deficiency who previously had uneventful interventions including Nerve root block, epidural and facet joint injection received trigger point injection in the mid thoracic paravertebral region. In total 10ml of 1% Lidocaine was injected at four trigger points after clear aspiration.

Results:

A few minutes later the patient complained of dizziness, hoarseness in voice, tinnitus, and metallic taste, suggestive of Lidocaine toxicity. Patient was treated with high flow oxygen and intravenous fluids. Patient was monitored by the medical staff and made full recovery in 2 hours.

Conclusion:

Despite previous uneventful exposure to lidocaine and it being considered to be a safe drug for G6PD deficiency sufferers, this patient presented with signs of CNS toxicity after administration of Lidocaine. A low index of suspicion for lidocaine toxicity in patients with G6PD deficiency is advised. Further studies are required to ascertain the safety of Lidocaine in these patients.

Referenses:

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EFIC5-0117

Pain treatment (conservative): Headaches

EPIDURAL BLOOD PATCH FOR TREATMENT OF ORTHOSTATIC HEADACHE

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Background : Epidural blood patch has been performed for treatment of orthostatic headache related to iatrogenic and spontaneous intracranial hypotension.

Aim : This retrospective study was conducted to investigate epidural blood patch.

Methods : Data such as gender, weight and height, cause of orthostatic headache, test for evaluating the leakage site of CSF, injection level, the number of conducted procedures, and the baseline and post-treatment pain intensities were collected by reviewing patients' medical records. We classified the patients into two groups according to cause of orthostatic headache: spontaneous and iatrogenic group.

Results : 127 patients (149 cases of epidural blood patch) with orthostatic headache were managed by epidural blood patch. The most common injection site was lumbar spine (71.1%). The average pain intensity (5.3/10) before procedure was statistically higher than that (1.5/10) after the procedure. Most patients (83.5%) presented improvement of their symptom by a single procedure. 27 patients were classified into spontaneous group whereas 100 patients were into iatrogenic group. Both demographic data and pain intensities of each group were not significantly different. The most common injection site was cervico-thoracic junction (41%) in spontaneous group and lumbar spine (90%) in iatrogenic group ($P<0.001$). The average number (1.5) of conducted epidural blood patch in spontaneous group was significantly higher than that (1.1) in iatrogenic group ($P=0.007$).

Conclusions : Epidural blood patch was an effective method for treatment of orthostatic headache. However, patients with spontaneous orthostatic headache require repeat of procedure compared to those with iatrogenic orthostatic headache.

CHRONIC MIGRAINE: THE EFFECTIVENESS OF NON-PHARMACOLOGICAL TREATMENT BY TRANSCRANIAL ELECTRICAL STIMULATION.

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Background. A large number of patients with chronic migraine do not respond to classic abortive pharmacotherapy, which raised the interest of non-pharmacological research methods of treatment, particularly those related to neuromodulation. Transcranial electrical stimulation (TES) is a relatively new non-invasive method with a real perspectives in treatment of chronic migraine.

Aim. To assess the effectiveness of TES in the treatment of chronic migraine.

Method. We recruited 62 patients with chronic migraine with mean age 38.3 ± 10.7 years (50 females, 12 males) divided into: group 1 – 47 patients that received non-pharmacological treatment by TES and placebo group 2 – 15 patients. In patients with curative regime has been applied a continuous electrical current, with the intensity of 1.4 mA, associated with the alternating rectangular impulse form current, with intensity of 2.8 mA, impulse of 4.0 ms and frequency of 77.5 Hz for 40 minutes. Was determined serum levels of β -endorphins and patients completed Autonomic Profile (I. Moldovanu, 2011) before and after the treatment, the results were compared and statistically analysed.

Results. It was a statistically significant reduction in the frequency of migraine attacks and severity of pain in group 1 with increase serum level of β -endorphins compared with group 2 ($p < 0.001$). According to Autonomic Profile, it was revealed a significant reduction of pain, anxiety and cardiovascular dysfunction in group 2, compared with group 1.

Conclusion. TES is a valuable, effective and inexpensive non invasive non-pharmacological treatment of patients with chronic migraine, which need to be implemented in daily clinical experience.

PROPOFOL IN POST DURAL PUNCTURE HEADACHE TREATMENTA. Heroabadi^{1,2}, M.A. Ashraf Noyan³¹Brain and Spinal Cord Injury Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran²Anesthesiology, International Neuroscience Institute, Hannover, Germany³Anesthesiology, Imam Khomeini Hospital, Tehran, Iran

Backgrounds: according to the increased use of spinal anesthesia the disabling Post Dural Puncture Headache (PDPH) after Dural puncture and reduced ICP is a common post-operative complication especially in caesarian section(C/S).

Methods: in this prospective clinical trial 80 patients having PDPH after C/S were randomly divided in 4 treatment groups. Group1 (G1) received conventional treatment including Fluid therapy, NSAIDs, Paracetamol and Coffein. Group2 (G2) received IV Hydrocortisone 100mg every 8 hours for 48 hours, Group3 (G3) received IV Propofol 20mg PRN every 20min maximum 60mg and the fourth group (G4) received a combination of IV Hydrocortisone 48 hours and IV Propofol with the same method as G3. For each group Pethidine 50-100 mg IM/SC repeated every 1-3hr PRN was considered as the rescue treatment. Pain assessment was based on Visual Analogue Score (VAS) that evaluated at the start of treatment and on 1st, 6th, 24th and 48th hour after starting treatment. VAS values < 4 were defined as response to treatment.

Results: a significant response to treatment was observed in G3 and G4 after one hour of starting therapy. In G2 significant response to treatment occurred after 6 hours comparing to G1. After 24 hours there was not any significant difference in VAS between four groups.

Conclusion: Propofol can be considered as a useful therapy for rapid treatment of PDPH, but is not suggested for maintenance therapy and it can be used in combination with other therapies like corticosteroids and analgesics for a longer effect.

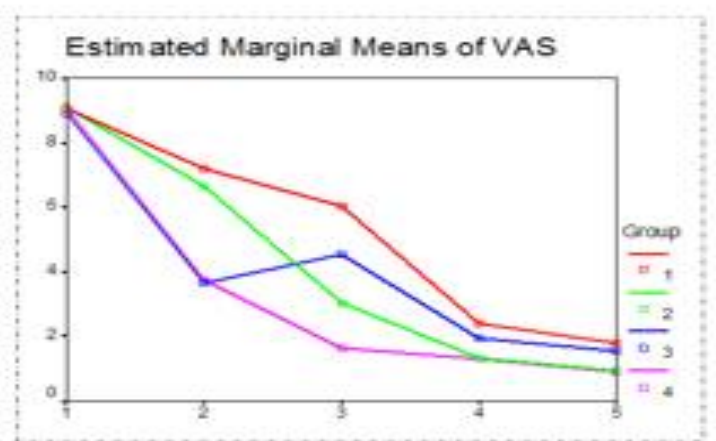


Figure 1: Comparing VAS in 4 treatment groups. 1: start time, 2: 1st, 3: 6th, 4: 24th and 5: 48th hour after start of treatment.

EFIC5-0493

Pain treatment (conservative): Headaches

EFFECTS OF SUBCUTANEOUS DICLOFENAC FOR SYMPTOMATIC TREATMENT OF MIGRAINE

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Background and aims. Although Nonsteroidal Antiinflammatory Drugs (NSAIDs) are not the first line therapy for migraine attacks, especially of severe intensity, they remain the most frequently employed compounds in many countries. This study tested effectiveness and acceptability by the patients of symptomatic migraine treatment with the new subcutaneous formulation of diclofenac sodium (ScD).

Methods. Inclusion criteria: both sexes, age>18 years, migraine diagnosis, no allergy/intolerance/contraindications to NSAID use, scarce responsiveness or contraindications to triptan use, informed written consent. Patients prescribed ScD for their migraine attack/s (25mg or 50mg) were asked to rate: pain intensity before injection and after 1 and 2 hours, and discomfort at the injection [0-10 numeric scales].

Results. Seventy-six migraineurs (49 women, 27 men, aged 44±13SD years) were enrolled (67 without aura, 9 with aura; monthly crises: 4.4±4.8SD). In fifty-three attacks treated with ScD50, pain intensity decreased from 8.38±0.14SE to 2.94±0.31 at 1 hour and 1.34±0.24 at 2 hours. In 31 attacks treated with ScD25, pain intensity decreased from 6.74±0.19 to 5.1±0.22 at 1 hour and 4.77±0.18 at 2 hours. The trend for improvement was significant for both doses, but significantly higher for ScD50 (p<0.001). Discomfort at the injection was mild with both doses, although significantly higher for ScD50 than ScD25 (2.3±0.12 vs 1.13±0.11; p<0.001).

Conclusions. Subcutaneous diclofenac at a dose of 50mg proves highly effective in relieving migraine pain of moderate-severe intensity, with relatively minor discomfort at the injection. It can represent a valid therapeutic option for migraine patients who can be treated with NSAIDs.

EFIC5-0576

Pain treatment (conservative): Headaches

DRUG UTILISATION STUDY OF ANTIMIGRAINE PRODUCTS IN A SOUTH AFRICAN PRIVATE SECTOR PATIENT POPULATION WITH THE FOCUS ON TRIPTAN PRESCRIBING

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Background and aims: The World Health Organisation reports the prevalence of migraine to be 3% to 7% in Africa from community-based studies. Little is known about the treatment and the burden of illness of migraine in Africa. The primary aim was to analyse the prescribing patterns and cost of different antimigraine products and to compare the results with previous studies.

Methods: A retrospective drug utilisation study was conducted on private sector medical aid claims data for 2013. No diagnoses or clinical information was available.

Results: A total of 719 patients received 1507 antimigraine products at a cost of R223423.69 during 2013. The majority of patients (74.41%) were females. Only 12.81% of patients claimed their antimigraine products from the chronic plan of their medical aid scheme. Clonidine was the most frequently prescribed active ingredient (accounting for 52.09% of the number of prescriptions, yet for only 30.66% of the amount claimed for antimigraine products). Triptans (selective serotonin (5-HT_{1B/1D})-receptor agonists) accounted for 23.03% of antimigraine prescriptions, but accounted for 38.59% of cost. Five different triptans were prescribed. The average cost per sumatriptan prescription was the lowest (R181.45) of the triptans. Sumatriptan was the only triptan with generic equivalents that were prescribed. Rizatriptan was the most often prescribed triptan, accounting for 68.59% of triptan prescriptions. Tablets and wafers were the preferred dosage forms.

Conclusions: The results of this study were similar to previous studies, and confirmed a decreasing trend in triptan prescribing and an increase in the prescribing of branded generics.

EFIC5-0770

Pain treatment (conservative): Headaches

DETOXIFICATION IS EFFECTIVE FOR MEDICATION-OVERUSE HEADACHE.

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Background and aims: Patients who fail withdrawal are often excluded from studies on medication-overuse headache (MOH). We aimed to evaluate the long-term efficacy of two different MOH treatment programmes in so-called treatment-resistant patients.

Methods: MOH patients, who had previously been unsuccessfully treated by neurologists, were enrolled in one of 2 structured detoxification programmes in a tertiary headache centre: A) a one-week withdrawal with restricted analgesics, rescue medications and prophylactics from day 1 followed by restricted intake of symptomatic medications or B) a 2-month drug-free period and multidisciplinary education in groups and subsequent initiation of restricted symptomatic medication and prophylactics as required. All patients were closely followed up for a year.

Results: 78 of 89 patients completed the 12-month follow-up. Totally, headache frequency was reduced by 37% ($p < 0.001$), medication use by 61% ($p < 0.001$) and 84% remained cured of MOH. Headache frequency was reduced by $\geq 50\%$ in 43 patients (48%) and 52 (59%) reverted to episodic headache, and with no difference between the groups. Patients in programme B used significantly less symptomatic medication: 6.5 days/4 weeks compared with 8.7 days/4 weeks in programme A ($p = 0.02$), and the 55% of patients in programme B who needed prophylactic medication was significantly less than the 80% in programme A ($p = 0.02$). Furthermore, programme B required fewer resources from the staff.

Conclusions: Structured detoxification with close follow-up for one year is highly effective in patients with previously treatment-resistant MOH. We recommend a multidisciplinary educational programme for patients in groups due to cost-effectiveness and limited use of medication.

EFIC5-0816

Pain treatment (conservative): Headaches

BRIEF INTERVENTION FOR MEDICATION-OVERUSE HEADACHE IN PRIMARY CARE (THE BIMOH STUDY) – AN OPEN LONG-TERM FOLLOW-UP

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Background and aims: Most medication-overuse headache (MOH) patients overuse over-the-counter drugs and are managed by their general practitioner (GP). The aim of this study was to evaluate the long-term effectiveness of a brief intervention (BI) for MOH.

Methods: A pragmatic cluster-randomised controlled trial in primary care in Norway. Fifty GPs were randomised to receive BI training or continue their business as usual (BAU). 25,486 patients aged 18-50 years were screened by a questionnaire. Patients were cluster-randomised and received treatment by their GP. GPs practising BI assessed their patients using the Severity of Dependence Scale. Based on this score, patients received feedback about the risk of MOH, and recommendations for reducing headache medications.

Patients were assessed with a blinded interview after three and six months. After six months, GPs in the BAU group were also taught BI and most patients in the BAU received BI. An open follow-up was conducted after 12 months.

Results: 42% responded to the screening questionnaire. A random selection of 104 patients with self-reported MOH was invited, 75 of these were randomised and 60 included. 57 patients were followed-up after twelve months. BI was better than BAU with improvements only in the BI group at three months which persisted up to 12 months. Patients in BAU that received delayed BI also improved significantly compared to baseline after their BI intervention. Further results are currently being analysed and will be presented.

Conclusion: BI for MOH in primary care has effects lasting over twelve months.

EFIC5-0358

Pain treatment (psychological): Family assisted treatment

PERSON FAMILY WITH CRITICAL ILLNESS: TRAINING AND INVOLVEMENT IN THE CARE PROCESS

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Background and AIMS: The family of a sick person, facing a critical illness situation with hospitalization in an ICU, experienced significant transition changes, with physical and emotional effects. The possibility of relieving pain and suffering of the sick person reveals his family's biggest concern wishing that became a central intervention area for nurses. During visiting times they will look forward to collect information regarding the diagnosis, the prognosis and the therapeutic interventions and also about the diagnostic to be performed as well as to know how they can participate in the care process. The aim of this study was to understand how information empowers the family who experienced living in ICU and how this enables them to get involved in the care process.

Method: 15 adult family members hospitalized in UCI were interviewed. The analysis and interpretation of the narratives, performed according to the phenomenological approach suggested by Van Manen. Support used for Data analysis Nvivo8.

Results: It has been found that information can provide security, support and comfort to the family. Communication with the staff and sharing information allows them to have moments of closeness and feeling like they have been accepted in care context having a connection with the situation. Thus they build the participation and involvement in the care process.

Conclusions: The information enabling the family to understand the situation, the involvement in the care process and the constant well-being and comfort monitoring of his relative, especially in pain and suffering situations.

EFIC5-0998

Ethics, education, history, law: Ethics – animal research

EFFECTS OF BORRERIA VERTICILLATA (L.) G. MEY. ON NOCICEPTION MODEL OF NEUROPATHIC PAIN

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INTRODUCTION: *Borreria verticillata* plant species from Brazil presents antipyretic, analgesic, anti-inflammatory. OBJECTIVE: Evaluate the effects of *Borreria verticillata* on nociception model of neuropathic pain. METHODS: Dried leaves of *Borreria verticillata* were used to obtain the hydroalcoholic extract (EBV). Induction of neuropathic pain was performed constriction of the sciatic nerve (Bennett and Xie). The animals were divided into three groups: constriction (GCTs, n=6), saline (GSC n=6), sham (GS, n=6). We evaluated the thermal hyperalgesia and mechanical allodynia on day 0 (baseline), 1, 5 and 10 and after this period, serum biochemistry analysis was performed. RESULTS: In the assessment of hyperalgesia on day 1 increased by 43.4% to saline GCT compared to the GSC increased EBV 100 hyperalgesia compared to EBV 200 53.5% and 500 52.2%. Treatment with EBV 100, 200 and 500 did not alter the mechanical allodynia when compared to GST saline on days 0, 1 and 5. However, the EBV 100 increased allodynia by 34.2% and 27.6% compared to saline GCT and EBV 200 respectively. The EBV 200 at the same time decreased by 42% compared to the GSC allodynia and 45.9% compared to GS. At the day 10, EBV 500 increased allodynia 99.3% compared to GCT and 60% compared to EBV 200. The EBV doses used did not cause changes in AST dosages, ALT, creatinine, urea, glucose, total cholesterol, HDL and triglyceride. However, EBV 100 lowers HDL in 41.1% compared to the GS. Conclusion: The presented EBV algescic doses showed activity in treating neuropathic pain.

THE MANAGEMENT OF PAIN AND OPIOID USE FOR CANCER PATIENTS AT PALLIATIVE CARE CLINIC

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Background and aims

Pain is one of the most important symptoms in palliative care, which has a major impact on the quality of life of cancer patients. In developing countries, difficulties in accessibility of opioids and lack of well-established palliative care organizations result in under-treatment of pain. Turkey is one of the countries with statistical evidence of inadequate morphine consumption per capita. In 2010, the adequacy of opioid analgesic consumption was only 7% - based on a per capita consumption of 14.31 mg morphine equivalents. This study described the patterns of opioid use among cancer patients in palliative care clinic.

Methods

The data of 418 cancer patients who received specialist palliative care at our palliative care clinic in year 2014 were evaluated retrospectively.

Results

183(44%) of the patients were female and 235(56 %) male. Their ages ranged from 18 to 93 years (61±15). No opioids had been prescribed for 9% of patients, 26% of patients were using weak opioids, and 65% of patients were using strong opioids. Daily oral morphine equivalent dosage per patient was found to be 172±58mg (40-328). Indications for opioid use were pain (61%), dyspnoea (19%), and both dyspnoea and pain (20%).

Conclusion

Although there is limited variety of opioids in our country, the primary role of pain physicians in administration of palliative care in our clinic provided effective and adequate level of pain management. The relatively high incidence of weak opioid use may be associated with the lack of available rapid release opioids in our country.

COMPARISON OF BUPIVACAINE PLASMA LEVELS RESULTING FROM DIFFERENT MODES OF ITS ADMINISTRATION IN PALLIATIVE CANCER PATIENTS

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In advanced cancer, diminished organ(s)' reserve, cytokines' overproduction and polypharmacy affect the safety of a given treatment, bringing the risk of neuro- and cardiotoxicity of the local anaesthetics used to relieve pain refractory to the WHO analgesic ladder drugs. A mode of administration determines these drugs' systemic absorption.

We present five cases of intractable, severe, cancer pain treated in a hospice in-patient unit, to compare analgesic efficacy, safety, and bupivacaine plasma concentrations following different routes of bupivacaine administration: paravertebral (boluses, constant infusion), intrathecal (boluses), epidural (constant infusion) and topical (gauze pad) on a bedsore (all in the lumbar region), as well as the rectal one (enemas). Patients had concomitant disease(s) and hypoalbuminaemia. Bupivacaine plasma levels were quantified by HPLC MS.

Substantial pain relief was achieved in all five cases. Neurotoxicity was transiently observed in one case, when the bupivacaine epidural dose was increased, resulting in its plasma concentrations raised tenfold. Sudden hypotension, following spinal drug administration, regressed after treatment and bupivacaine dose reduction in another patient. All cases had their bupivacaine's total plasma concentrations within safe ranges: 22.9-927.4 ng/mL for paravertebral, 67.5-317.2 ng/mL for intrathecal, 9.6-362.5 for epidural, 46.5-235.7 ng/mL for rectal and <0.5-16.1 ng/mL for topical mode of administration; constant infusions resulted in a higher levels. Bupivacaine elimination constant varied depending on a patient, mode of administration and dosage.

Invasive and non-invasive use of bupivacaine is effective; the first one, especially constant infusions in advanced cancer, require extremely careful drug titration, plasma level monitoring and clinical control.

EFIC5-0718

Pain treatment (conservative): Palliative Care

PAIN MANAGEMENT IN A COHORT OF BRAZILIAN HEMODIALYSIS PATIENTS

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Background and aims: Chronic pain is a significant problem in hemodialysis patients and has been shown to be associated with poor quality of life. The guidelines of the World Health Organization established for the treatment of pain has been adapted to the patients with renal failure, but there is little information on whether pain in hemodialysis patients has been adequately treated. The purpose of this study is to describe the management of pain in a cohort of Brazilian hemodialysis patients. **Methods:** A cross-section of baseline data of 740 of the 837 adult patients enrolled in the Prospective Study of the Prognosis of Chronic Hemodialysis Patients (PROHEMO) in the city of Salvador, Brazil. Pain was evaluated by questionnaire that incorporated the McGill Pain Questionnaire, Brief Pain Inventory and Pain Management Index. Chronic pain was defined as lasting over 3 months. **Results:** The prevalence of chronic pain was 41.5% and 81.8% of patients had moderate or severe pain. Most chronic pain patients reported moderate to severe detrimental interference of pain on general activities. The Pain Management Index was negative in 89.8% of patients, indicating ineffective management. Eighty-eight percent of patients had not used adjuvants therapy such as antidepressants and anticonvulsants for pain control. No-pharmacologic intervention such as physical therapy was reported by 19.5% of patients. **Conclusions:** These results suggest a poor control of pain in hemodialysis patients. The management and assessment of pain in hemodialysis patients is a priority that should be promoted both within clinical practice, interdisciplinary team model and research.

EFIC5-0917

Pain treatment (conservative): Palliative Care

THE FREQUENCY AND FACTORS ASSOCIATED WITH DELIRIUM IN CANCER PATIENTS AT PALLIATIVE CARE CLINIC

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Background and aims

Delirium is a complex but common disorder in palliative care with a prevalence between 13 and 88% but a particular frequency at the end of life, yet often remains insufficiently diagnosed and managed. The aim of our study is to determine the frequency of delirium and identify factors associated with delirium at palliative care clinic.

Methods

Two hundred thirteen consecutive inpatients from October 1, 2012 to March 31, 2013 were studied prospectively. Age, gender, Palliative Performance Scale (PPS), Palliative Prognostic Index (PPI), length of stay in hospital and delirium etiology, subtype were recorded. Delirium was diagnosed with using Delirium Rating Scale (DRS) and Diagnostic and Statistical Manual of Mental Disorders, 4th Edition Text Revision (DSM-IV TR) Criteria.

Results

The incidence of delirium among the cancer patients was 49.8%. Mean age was 60.3±14.8 (female 41%, male 59%, PPS 39.8%, PPI 5.9±3.0, length of stay in hospital 8.6±6.9 day). Univariate logistic regression analysis indicated that use of opioids, anticonvulsants, benzodiazepines, steroids, and polypharmacy, infection, malnutrition, immobilization, sleep disturbance, constipation, hyperbilirubinemia, decreased PPS and increased PPI were risk factors. Subtypes of delirium included hypoactive %49, mixed %41, and hyperactive 10%.

Conclusion

The communication problems associated with delirium generate distress for the patient, their family and health-care practitioners, who might have to contend with agitation, and difficulty in assessing pain and other symptoms. To manage delirium in cancer patients, clinicians must be able to diagnose, identify and treat the underlying or aggravating causes appropriately.

EFIC5-0304

Pain treatment (psychological): ehealth and mhealth delivery

DARWEB: AN ONLINE INTERVENTION FOR CHILDREN WITH RECURRENT ABDOMINAL PAIN AND THEIR PARENTS.

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Background and aims:

One of the most common pain problems in children is recurrent abdominal pain (RAP). Although psychosocial interventions are effective to help children with RAP and their families, access to these interventions is difficult. For this reason, we have developed an online intervention for children with RAP and their parents (DARWeb). In this work we will present preliminary data about DARWeb's effects.

Methods:

Results will include families entering the program until March 2015. Children between 9 and 15 years old with non-organic recurrent abdominal pain, and their parents, are invited to participate. They complete questionnaires to assess abdominal pain (Abdominal Pain Index; API) and quality of life before and after participating in the program (Pediatric Quality of Life Inventory; PEDSQL). Moreover, at the end of the program we also ask them about their subjective perceptions of DARWeb's effects on their condition.

Results:

This is an ongoing pre-post study, and complete results (based on around 20 families) will be presented on the poster. Taking into account the 13 families who have already completed the program, results show a non-significant trend in the reduction in API scores, and most of the families suggest in qualitative analyses that DARWeb helped them. There are no differences on PEDSQL scores.

Conclusions:

Results of this preliminary test are encouraging, and we hope to extend them and find more significant results with a larger sample. If results are confirmed later in a randomized clinical trial, DARWeb could be considered a good alternative for families in this situation.

EFIC5-0452

Ethics, education, history, law: Ethics – clinical practice

BIOETHICAL ANALYSIS OF THE AUTONOMOUS DECISION OF THE PATIENT WITH CHRONIC PAIN TO THE ACCEPTANCE OF OPIOID DRUGS

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Introduction: It is considered that the patient receiving full information about their drug treatment with opioids, according to their understanding and their families will have more tools to make a free and informed decision and improve compliance, which will increase the effectiveness, safety profile and cost of opioid analgesic. Moreover, knowing the reasons that influence or determine the patient's decision to accept or refuse treatment with opioid drugs, allow us to design strategies to improve acceptance and adherence to long term.

The aim of this study is to describe the information provided by the physician of the pharmacological treatment with opioids and understanding the reasons why a patient decides to be treated with opioids.

Methods: Prospective, single-center, observational study developed at the Pain Unit of Alicante General Hospital during 12 months. This will be conducted in regular monitoring visits of 250 patients from the Pain Unit. Medical history information concerning the characteristics of chronic pain, socio and demographic characteristics, presence of adverse drug reactions and the reasons why patients decided to be treated with opioids will be collected.

EFIC5-1061

Ethics, education, history, law: Ethics – clinical practice

EVALUATION OF BIOAVAILABILITY/BIOEQUIVALENCE TRIALS INCLUDING ANALGESIC DRUGS IN OUR CLINIC

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Background and aim: For approval of generic drug products, authorities requires that evidence in similar bioavailability of drugs within acceptable limits. If two drug products are shown to be bioequivalent in average bioavailability, it is assumed that they will reach the same therapeutic effect or they are therapeutically equivalent and hence can be used interchangeably. The bioequivalence trials are changing over years. We aimed to analyse bioavailability(BA)/bioequivalence (BE) trials including analgesic medicines which were carried out in our clinic between 2000-2014 years.

Methods: Retrospectively, investigators trial files of BA/BE trials which were conducted in our clinic, Hakan Cetinsaya Good Clinical Practice Center, between 2000-2014 years were reviewed. The pharmaceutical groups and active ingredients of analgesic drugs were noted and compared according to years.

Results: The number of trials which were performed in our clinic were 1116 until the end of 2014. They were performed for both Turkish and foreign pharmaceutical companies from different countries. If we group these trials, 116 trials included analgesic medicines. Most of them were performed in 2010. The largest group in these medicines was etodolac. Besides that diclofenac, naproxen and flurbiprofen were the other large groups. Some of them were consist more than one drug in a pharmaceutical form.

Conclusions: The number of BA/BE trials that related analgesic medicines changes according to years. Pharmaceutical companies take into account the different parameters for choosing the analgesic drug development. In the last years, modified released pharmaceutical forms and combined therapeutics for analgesics were more performed in these trials.

IATROGENIC SEROTONIN SYNDROME WITH TRAMADOL AND DULOXETINE

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Background and aims

Serotonin syndrome (SS) can result from a complex interaction between serotonergic drugs. We report the case of a patient with mixed chronic pain (neuropathic and nociceptive) with a diagnostic of SS after the simultaneous use of tramadol and duloxetine.

Methods

Male, 66 years old, with previous history of hypertension and type 2 diabetes mellitus, presenting with mixed chronic shoulder pain after multiple surgeries. He was treated with pregabalin, tramadol, duloxetine and lidocaine patches.

Results

At the emergency department, the patient complained of drowsiness, fatigue, behavioural changes and slurred speech. He was hemodynamically stable and subfebrile, with agitation, dysarthria, diaphoresis, repetitive and incomprehensible speech and tremor. He presented with hypoxemia, sinus tachycardia and no radiological or laboratory diagnostic changes. He was hospitalised and in the morning exhibited exuberant myoclonus and a focal crisis with secondary generalization. He did not regain consciousness and was sedated, intubated and ventilated for 2 days. After extubation, he had a total resolution of his condition, with no other complications or seizures.

Conclusions

The SS is a diagnosis of exclusion, demanding a thorough study. Vascular aetiology was excluded with radiological studies and no infectious or toxic agents were isolated. The use of serotonergic antidepressants associated with analgesic drugs which share this mechanism of action (such as tramadol) can result in SS. We decided to maintain duloxetine and replace the analgesic drug with an opioid without serotonergic effects, such as tapentadol.

EFIC5-0021

Pain treatment (psychological): Education and information

THE DEVELOPMENT OF A CLINICAL TOOL FOR THE PATIENT EDUCATION IN CHRONIC PAIN MANAGEMENT

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Background:

Pain neurophysiology education is a way to explain pain mechanisms, which is supposed to induce a reduction of maladaptive cognitive behaviour such as catastrophizing and misleading pain perception. The purpose of this study was to find scientific evidence for this type of patient education in the management of chronic pain. Secondly, we attempted to create a clinical working-sheet as starting point for explaining pain to the patient.

Methods:

A literature review in PubMed and Pedro was performed in order to retrieve all relevant papers. We included papers about pain neurophysiology education for treating persistent pain conditions. A Delphi questionnaire about strategies to increase activity levels with chronic pain was subsequently submitted to a special interest group of the Swiss chapter of IASP.

Results:

10 papers were included at the end of the selection process. A panel of 37 experts was contacted for the Delphi survey (two rounds), 15 participated (40.5%). Experts recommended face-to-face intervention to explain pain with a large use of metaphors. According to the answers of the participants, a tool with simple pictures without words was created, intended to support the explanations of pain.

Conclusion:

Pain neurophysiology education apparently shows good potential in changing some maladaptive cognitive behaviours. However the review literature revealed scarce evidence due to the small number of papers addressing this specific aspect of pain education. More studies are needed to determine the suitability of a specified population, which could benefit from this educational approach.

EFIC5-0257

Pain treatment (psychological): Education and information

THE DEVELOPMENT OF A BOOKLET ABOUT LOW BACK PAIN: A STUDY IN SYMPTOMATIC AND ASYMPTOMATIC SUBJECTS

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Background and aims: A booklet for patients with low back pain (LBP) was developed in our Rehabilitation Center a few years ago. According to a group of experts, it should be even more focused on the biopsychosocial model and the explanation of the neurophysiology of pain. After the modification of the booklet according to the experts' suggestions, the objective of this study was to determine if this new version is adapted to people with or without LBP.

Methods: The appropriateness of the revised version of the booklet (48 pages in a Question and Answer format) was assessed by means of a satisfaction questionnaire submitted to 44 subjects with LBP and 53 asymptomatic participants; they were also asked to score the booklet (0-10).

Results: The satisfaction questionnaire highlighted the great satisfaction of the subjects regarding the booklet (mean score of 8/10, with no statistical difference between groups). Although some asymptomatic subjects (39,6%) found the booklet too long, most subjects with LBP (83,7%) stated that the length of the booklet was appropriate thanks to its specific format (questions and answers) which allows reading only specific parts of it. According to 50% of the participants (no statistical differences between groups) the booklet should be distributed to the general population.

Conclusions: This study demonstrated that the booklet developed in our department is adapted to both asymptomatic subjects and subjects suffering from LBP. A study on a larger scale and with a follow-up should be conducted to know its true impact.

SELF-MANAGEMENT SKILLS IN CHRONIC DISEASE MANAGEMENT: WHAT ROLE DOES HEALTH LITERACY HAVE?

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Background and Aims

Self-management based interventions lead to improved health outcomes in people with chronic diseases, and multiple patient characteristics are associated with the development of self-management behaviours. Low health literacy (HL) has been implicated in poorer self-management behaviours, but the mechanisms behind this relationship remain unclear. The aim of the current review is to assess the impact of low HL on patient characteristics associated with the acquisition of self-management behaviours.

Methods

The review comprised three phases: (i) searches of databases were conducted, (ii) potentially suitable papers were screened for eligibility by two independent reviewers, and (iii) validity and internal reliability of the included studies was assessed.

Results

An initial search generated a total of 705 articles, of which 22 studies fulfilled the eligibility criteria: respiratory (n=3), musculoskeletal (n=3), cardiovascular disease (n=8), diabetes (n=2), kidney disease (n=1), HIV (n=1), and multiple chronic diseases (n=4). A consistent relationship was found between low HL and poorer disease-related knowledge in respiratory diseases and diabetes. A significant association between low HL and poorer self-efficacy was reported in cardiovascular diseases, diabetes, HIV, and multiple disease categories.

Conclusions

The findings from the current review suggest that low HL may impact on the acquisition of skills necessary for the development of self-management behaviours. Given that self-management strategies are core components in effective treatment of a range of chronic diseases, low HL poses a considerable public health concern. Further research is needed in order to develop and implement self-management based interventions from a HL perspective.

IDENTIFICATION OF CHRONIC PAIN AND NEEDS OF RELIEF IN PATIENTS UNDERGOING CHEMOTHERAPY

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Chronic pain is present in cancer patients undergoing chemotherapy. To alleviate this pain is important to have interventions and specific and effective care. The objective of this study was to identify non-pharmacological strategies for relief of chronic pain and nursing protocols for the management of chronic pain in patients undergoing chemotherapy. The methodology was through an interview with adult patients receiving chemotherapy from Chemotherapy Section at Hospital in Botucatu, São Paulo, Brazil. The study was approved by Research Ethics Committee protocol number 670 526 in June, 2014. The questionnaire of MCGILL was applied in 36 patients. This instrument evaluates the presence of pain including questions about pain management in everyday life. The analysis revealed the presence of chronic pain and change in sensitivity. The pain is tiring, radiant and uncomfortable from moderate to severe. Patients do not practice non-pharmacological actions. They take medicine for pain relief. Nursing can guide patients to do things to obtain pain relief promoting pleasure and relaxation. It is important to apply some techniques that to help the pain control without the need for pharmacological actions, such as, heat manipulation, cold manipulation, acupuncture, massage, exercise, yoga, relaxation, deep breathing, educational groups and hypnosis. It was found that nursing needs to have more scientific knowledge of the pain process, as well as non-medical therapies and to instruct patients about pain management. There was failure of nurses with regard to counseling patients because they reported the importance of receiving guidance on the control of pain.

AN INVESTIGATION OF HEALTH LITERACY LEVELS IN INDIVIDUALS WITH AND WITHOUT CHRONIC PAIN - A CROSS-SECTIONAL SURVEY

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Background

Inadequate health literacy (HL) - a person's ability to find, understand and utilise information effectively to make informed decisions about their health, has been linked to poorer health outcomes in a number of chronic diseases. Although inadequate HL scores have been established in Ireland at 40%¹, the impact of HL in those with chronic pain is unknown. Given the high cost of chronic pain to the Health Service, this study aims to establish if HL scores differ in people with and without chronic pain.

Methods

A cross-sectional questionnaire was distributed in three pain clinics, in university hospitals in Dublin. Patients with chronic pain and a control group (non-pain participants) were recruited. The questionnaire comprised a demographic section (gender, age, educational attainment, and socioeconomic status) and a validated tool for measuring HL (Newest Vital Sign).

Results

Overall, 162 participants were recruited: chronic pain (n=81), controls (n=81). Apart from gender where a significant difference was observed ($X^2=6.124$, $p=0.013$), both groups displayed similar demographical characteristics. No difference in inadequate HL scores was found between the two groups: [pain (65.4%, n= 47), control (46.9%, n=35), $X^2=3.556$, $p=0.059$]. For chronic pain participants, those with inadequate HL were more likely to have lower educational attainment ($X^2=16.081$, $p=0.003$), and be older ($X^2=6.124$, $p=0.001$).

Conclusion

Inadequate HL is prevalent in chronic pain patients, and therefore, plain English strategies must be employed to ensure that they have the ability to engage effectively in managing their condition.

1. Doyle et al. (2012) The European Health Literacy Survey: Results From Ireland.

EFIC5-0731

Pain treatment (psychological): Education and information

AN INVESTIGATION OF PEOPLE'S EXPERIENCES OF USING AN ONLINE APPLICATION TO EXPLAIN PAIN AS A MULTIDIMENSIONAL PHENOMENON: THE PAIN GARDEN

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Background: The Pain Garden is an online graphical representation of the experience of chronic pain. It uses garden as a metaphor to explain that pain affects people on different levels – sensory, emotional and well-being – which are separate but linked together.

Methods: 17 adults, each of whom had chronic pain lined with osteoarthritis, Rheumatoid Arthritis or chronic widespread pain completed an online survey after two weeks of access to the Pain Garden website. They gave their opinions about how useful the site was for them and its potential for other people with chronic pain.

Six clinicians were also interviewed.

Results: For people with pain, issues of value were: seeing the Pain Garden as more engaging than traditional information; presentation of the emotional and well-being dimensions of pain; reassurance that their experience is common and normal for someone with chronic pain; the potential to use the garden to link with other people. There was particular agreement that the Pain Garden would be most useful for someone initially trying to come to terms with living with pain. A minority of respondents were indifferent, though not hostile, to the Pain Garden.

For clinicians the issues of value were: potential to help people understand that their experience was normal in chronic pain and not exclusive to them. Their ideas for use in practice included: initiating discussions about pain; and encouraging people to share their thoughts and experiences.

Conclusion: The Pain Garden provides a novel approach to facilitating understanding and communication of pain.

INFORMATIVE AND RELATIONAL GROUND OF CONTACT IN THE COMMUNICATION BETWEEN MEDICAL PERSONNEL AND THE PATIENT OF PAIN TREATMENT CLINIC

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Introduction

In the light of biopsychosocial model of pain therapy the relationship between medical personnel and patients should be perceived through at least two grounds, mutually affecting one another. We assumed that under this model, one should aim at gaining knowledge of the barriers and expectations concerning the communication process at both sides.

Method

The aim of the research was to receive feedback concerning the expectations and barriers existing in the communication between a patient and a doctor during medical interview in Pain Treatment Clinic. The aim of the present work is to draw the readers' attention to the knowledge concerning the contact between a doctor and a patient. Tests have been performed on a group of patients of Pain Treatment Clinic $n=38$ and among the doctors of specialistic pain treatment care $n=9$ with the use of the semistructural interview method.

Results

The results reveal that for both parties i.e. patients and personnel contact make important parts of the diagnosing process and therapy. Informative and relational aspect, understood as showing respect and readiness to involve into a conversation in order to explain doubts, are also very important. The obtained results indicate that for the majority of the research group composed of doctors and nurses, empathic contact with patients makes an additional emotional load.

Conclusion

The research provides the results showing that the relational aspect of communication can influence on the course of analgesic therapy. Patients, who positively assess the way they were treated, are less afraid of consultations in order to control the course of treatment.

EFIC5-0014

Ethics, education, history, law: Education / Professional

INVESTIGATING HEALTH PROFESSIONALS' ACCOUNTS OF CHRONIC PAIN MANAGEMENT IN OLDER ADULTS: IDENTIFYING A FULL CONTENT DOMAIN.

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Background and Aims: Attitudes of health care professionals (HCPs) impacts on their management of chronic pain in older adults. It is important to understand the approaches of HCPs in their management of older adults with chronic pain, in order to address negative attitudes, and provide more targeted education and behavioural change strategies. This study aimed to explore current attitudes and approaches to pain management of older adults, from the perspectives of HCPs' representing multidisciplinary teams.

Methods: A convenience sample of HCPs was contacted via email and follow up postal invite. Semi-structured interviews were audiotaped and transcribed and independently reviewed for themes by two researchers utilising a thematic analysis approach, until it was agreed data saturation had been reached.

Results: Thirteen (46%) of 28 participants agreed to be interviewed and took part in an individual semi-structured interview. Six themes were found comprising; mobility communication, psychology, physiology, time, and resources.

Conclusions: HCPs' attitudes influenced their reported behaviour and these attitudes were projected on to those patients they treated. Their perceptions were often linked to beliefs that older adults would act or think in a certain way, despite evidence suggesting otherwise. These themes will be used to assist in the development of a questionnaire designed to measure attitudes of HCPs in the management of chronic pain in older adults.

DEVELOPMENT OF A MEASUREMENT TOOL OF HEALTH PROFESSIONALS' ATTITUDES AND BELIEFS TOWARD THE MANAGEMENT OF CHRONIC PAIN IN OLDER ADULTS: THE PROFABS-OA

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Background and aims: Chronic Pain has a detrimental effect on biological, social and psychological wellbeing. Older adults need a different approach to pain management, and studies show that health professionals (HPs) hold unhelpful attitudes and beliefs toward the management of pain in older adults; however no specific tools exist to measure this phenomenon. This study aimed to; 1) develop a tool to measure HPs' attitudes towards the management of chronic pain in older adults and; 2) Explore relationships within and between biographical variables.

Methods: A 28-item, 5-point Likert scale questionnaire was sent via email to 1113 HPs from different clinical backgrounds. Questionnaires were analysed for internal reliability using Cronbach's alpha coefficient, and construct validity measured using Exploratory Factor Analysis (EFA).

Results: 391 (35%) responses were received. EFA analysis indicated five components to be retained for examination. Two variables ('Occupation' and 'Others' with Pain) had statistical significance ($F(4, 386) = 12.2, p = 0.000$; $F(3, 387) = 5.76, p = 0.001$ respectively), with GPs' indicating less favourable attitudes and Psychologists indicating more favourable attitudes.

Conclusions: The ProfABS-OA demonstrated internal reliability and construct validity. Analysis found significant differences between occupations and for those with a personal or family experience of pain. The ProfABS-OA is able to distinguish between HP groups, and may also be able to provide some evidence towards methods for improving attitudes and beliefs towards chronic pain management in older adults, as pain education appears to be the only variable revealed that shows any difference when compared with occupational groups.

MANAGEMENT OF COMMON MUSCULOSKELETAL PROBLEMS IN FAMILY PRACTICE: PHYSICIAN'S KNOWLEDGE ASSESSMENT STUDY

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Background: 70% of patients with chronic pain, of who 46 % have musculoskeletal pain (MSP), are managed by primary care physicians (PCP). However, several studies have demonstrated deficiencies in PCPs ability to properly assess and treat MSP.

Aim: To evaluate knowledge of PCP in Israel in the assessment and the treatment of patients with MSP.

Design: PCP who participated in continuous medical education courses (not specifically in pain medicine) were requested to complete a questionnaire which consisted of a demographic and educational information part and 7 questions related to knowledge in MSP.

Results: Questionnaire were completed by 158 PCP who overall scored 68 ± 24 (mean $\pm$ S.D.). Based on their previous education in pain medicine PCP were categorized into three subgroups (Table 1): **I** physicians who were exposed to MSP education during medical school, residency, conferences, etc (n=41), **II**: those, who had no previous education in MSP whatsoever (n=57); and **III**: physicians who attended structured courses related specifically to MSP (n=60). Groups I and II exhibited low scores (57 ± 27 and 63 ± 21 respectively, whereas group III scored significantly higher (83 ± 15). Notably, PCP in group II were about 10 years older and had about 10 years of professional experience more than PCP in the other groups.

Conclusions:

PCP still have poor knowledge in the area of MSP. Informal education in MSP does not seem to improve knowledge in this field. Unfortunately, younger PCP still have similar deficits. These results show that there is a need for formal education to PCP in MSP medicine.

THE INFLUENCE OF EDUCATION ON ATTITUDES CONCERNING OPIOPHOBIA AMONG MEDICAL STUDENTS - A CROSS SECTIONAL STUDY

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Opiophobia is an irrational fear of using or prescribing opioids. Key barriers to prescribing opioids in physicians included addiction potential, abuse or misuse, side effects and fear of review by professional bodies. The consequence is an inadequate pain management.

We aimed to assess knowledge and attitudes of 3rd and 6th year medical students towards the issue of opiophobia in our community. A self-completed questionnaire was delivered to 361 out of 548 students of the 3rd year (65,87 %) and 307 out of 504 students of the 6th year (60,91 %).

Sixth year students estimated that they were more informed on the issue of opioid analgetics (3rd year median value - 2, interquartile range 2-3; 6th year median value - 3, interquartile range 3-4, scale 1-5; $P < 0,05$). Most of students stated that they do not know or not sure what a term "opiophobia" represents (3rd year 67.86%, 6th year 55.92%). Although most of our respondents believe that these drugs can relieve the strongest pain, they pointed out that the risk of abuse of opioids is conspicuous (3rd year median value - 3, interquartile range 3-4; 6th year 4, interquartile range 3-4, $P < 0,05$). The final year students provided significantly more accurate answers concerning the effects of opioids ($P < 0.001$). Also, students estimated that patients are greatly feared of certain side effects of opioids such as tolerance and respiratory depression ($P > 0.05$).

It is necessary to improve knowledge and attitudes of our medical students towards the issue of opiophobia.

EFIC5-0170

Ethics, education, history, law: Education / Professional

NURSES' RATIONALES AND EMOTIONS WHEN ADMINISTERING OPIOIDS

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Background:

Despite progress of in-hospital pain management, 25-40% of patients still suffer unacceptable pain. Reasons are manifold but personal experience suggests nursing staff are often reluctant to give sufficient amounts of opioids. This study was hence designed to explore post-registration nurses' views towards administering opioids.

Methods:

A questionnaire was designed and distributed to all n=334 nursing staff at Chelsea and Westminster Hospital, London, UK between 01.09. and 31.10. 2014. First, based on interviews a preliminary questionnaire was created and its content- and face-validity confirmed. Subsequently, redundant or ambiguous items were removed. The final questionnaire included 8 demographic questions and 14 regarding nurses' views towards administering opioids.

Results:

N=179 from 334 (54%) nurses (mean age: 36+/-10years; 85% female) participated. 48% had more than 10 years' experience. 30% worked in critical care, 23% on medical and 21% on surgical wards. Unambiguous answers were given when asked whether opioids scared them (83% disagreement), whether they associated opioids with assisted death (85% disagreement), whether they were more confident using familiar opioids (92% agreement) and whether they were constantly aware of opioid-induced side-effects (95% agreement). An undirected graphical model for item-dependence revealed four latent variables influenced nurses' answers: Conscious Decision-Making, Practice-Based Observations, Medication-Related Fears and Risk Assessment.

Conclusions:

This study showed nurses are influenced by both knowledge-based (rationale) and subjective (emotional) factors when administering opioids. Future programs to improve pain management would need to account for these findings. However, more research is necessary to determine the precise nature of the emotions that guide opioid administration.

EFIC5-0550

Pain treatment (conservative): Cannabinoids

ORAL INFUSION CANNABIS FOR CHRONIC NEUROPATHIC PAIN

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Background and aim: Neuropathic pain is a debilitating form of chronic pain resulting from nerve injury, disease states, or toxic insults, often refractory to conventional pharmacotherapies. Cannabinoids drugs have the potential to address this unmet need.

Methods: Bedrocan® a 'Sativa' dominant strain of cannabis characterized by 19% THC and <1% CBD was administered to adult patients with post-traumatic, post-surgical or degenerative neuropathic pain, afferent to the Centre for Pain Therapy of Careggi University Hospital, Florence, Italy. All patients gave written informed consent. The Visual Analogue Scale and the Brief Pain Inventory were used to evaluate pain intensity and quality of life.

Results: 23 patients have been included in the study and are currently under treatment, respectively 13 males (56.5%) and 10 females (43.5%). Mean age is 52.8±16.2 (48.9±18.7 M and 58.0±11.2 F (p=0.19). Mean duration of treatment is 172.7±103.4 days. Mean daily dose of Cannabis is 240.2±212.8 mg. Mean VAS was 7.5±1.9 at baseline and 5.3±1.9 following the treatment (p=0.0004). All patients showed a significant improvement in pain at its worst (p=0.0028) and at its least (p=0.0016) in the last 24 hours, on the average (p=0.0024) and instant (p=0.0404). The relief provided by pain treatments or medications was significantly improved (p<0.0001). Patients showed a significant improvement in general activity (p<0.0001), mood (p=0.0056), sleep (p=0.0005) and enjoyment of life (p<0.0104).

Conclusions: Our study reaffirm that cannabinoids show efficacy in suppressing diverse neuropathic pain states. Cannabinoids show promise for treatment of neuropathic pain either alone or as an add-on therapy.

POSTTRAUMATIC STRESS DISORDER AFTER HIGH-DOSE-RATE BRACHYTHERAPY FOR CERVICAL CANCER WITH TWO FRACTIONS IN ONE APPLICATION UNDER SPINAL/EPIDURAL ANESTHESIA: INCIDENCE AND RISK FACTORS

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Background and aims

To investigate the psychological consequences of high-dose-rate brachytherapy with 2 fractions in 1 application under spinal/epidural anesthesia in the treatment of locally advanced cervical cancer.

Methods

In 50 patients with locally advanced cervical cancer, validated questionnaires were used for prospective assessment of acute and posttraumatic stress disorder (ASD/PTSD) (Impact of Event Scale-Revision), anxiety/depression (Hospital Anxiety and Depression Scale), quality of life (European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30/Cervical Cancer 24), physical functioning (World Health Organization performance status), and pain (visual analogue scale), before and during treatment and 1 week and 3 months after treatment. Qualitative interviews were recorded in open format for content analysis.

Results:

Symptoms of ASD occurred in 30% of patients 1 week after treatment; and of PTSD in 41% 3 months after treatment in association with this brachytherapy procedure. Pretreatment predictive variables explain 82% of the variance of PTSD symptoms. Helpful experiences were the support of the treatment team, psychological support, and a positive attitude. Stressful factors were pain, organizational problems during treatment, and immobility between brachytherapy fractions.

Conclusions

The specific brachytherapy procedure, as performed in the investigated setting, bears a considerable risk of traumatization. The source of stress seems to be not the brachytherapy application itself but the maintenance of the applicator under epidural anesthesia in the time between fractions. Patients at risk may be identified before treatment, to offer targeted psychosocial support. The reported stressful factors serve as a basis for improvement of patient management.

HOW DOES THE HEALTH-RELATED QUALITY OF LIFE CHANGE AFTER MULTIDISCIPLINARY PAIN MANAGEMENT ?

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Background and aims

The outcomes of multidisciplinary pain management (MPM) of chronic non-malignant pain patients vary between individuals. Our aim was to assess the effect of MPM on health-related quality of life (HRQoL) and to search for factors predicting good or poor HRQoL outcome.

Methods

This was a prospective, observational follow-up study of 1425 chronic non-malignant pain patients attending a tertiary pain clinic. A generic HRQoL instrument (15D) was filled in by 1425 patients at the start of treatment and at 6 and 12 months after. Patients also answered the standard questionnaire of the pain clinic at the first visit.

Results

A total of 903 patients (63.4%) responded to the 15D follow-up at 12 months. Of these, 53.3% had experienced at least a minimum clinically important improvement in the HRQoL score (> 0.015) and 42.4% had experienced a clinically major improvement (> 0.035). The mean change in the score was 0.019. However, 23.7% experienced a clinically major deterioration (< -0.035). In the preliminary analyses, only non-significant or very weak predictors for the score change were identified.

Conclusions

After MPM, the mean HRQoL score of the patients improved in a clinically important manner, but in nearly one fourth of the patients the HRQoL deteriorated. Pain-related factors, such as pain intensity VAS, were not significant predictors of good or poor HRQoL outcomes, and factors showing statistically significant predictive value (socioeconomical position, low baseline 15D score) explained only a minor fraction of the observed change in HRQoL.

CAN WE PREVENT PERSISTENT POSTOPERATIVE PAIN?

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Aim of Investigation: A number of pre-operative risk factors can increase the probability of chronic postoperative pain including previous pain conditions, psychosocial factors, genetic factors, intraoperative factors and individual pain sensitivity. The aim of our work is to identify pre-operative risk factors that appear to increase the probability of chronic postoperative pain.

Methods: We analyzed 73 patients who underwent open cholecystectomy. Our multimodal perioperative analgesic protocol has implied for all patients: detail preoperative interview (early pain experience), preemptive medication (coxibs, midazolam), surgical wound infiltration with local anaesthetic (Bupivacain 0,25%) and postoperative analgesic combination ketoprofenum and tramadol. Before surgery all of the patients had done psychological tests MMPI (*Minnesota Multiphasic Personality Inventory*) and PIE (*Emotions Profile Index*) for personality assessment.

Results: Based on the MMPI and PIE personality assesment test before surgery, it was found that over 75% were frightened and agitated patients. For the pain assessment we used VAS (*visual analogue scale*) every 6h the first two days after surgery when we measured arterial blood pressure (ABP), heart rate (HR) and respiratory rate (RR) also. We have analysed the influence of sex, age, preoperative chronic pain, anesthetic technique, surgical procedure.

Conclusions: Peristant postoperative pain is a disabling disease and prevention of this can be of significant health benefit. Special attention to the importance of surgical techniques for preventing persistent postsurgical pain. Careful perioperative analgesia results in the high quality of care. MMPI and PIE can be useful in prevention of persistent postoperative pain.

EFFECTIVENESS OF MULTIMODAL ANALGESIA AFTER TOTAL HIP ARTHROPLASTY

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Aim of Investigation: Knowing the specifics of orthopedic surgical procedures, as well as potential complications, is a prerequisite for optimal postoperative treatment. Inadequate analgesia at any point of the perioperative period will introduce the patient to sensitization, inflammation and chronic pain syndrome. Our aim was to evaluate the effectiveness of multimodal analgesia procedure after total hip arthroplasty in the early postoperative period.

Methods: The protocols were based on multimodal therapy, with the association of nonsteroidal anti-inflammatory drugs (NSAIDS), opioids and regional anesthesia techniques. The advantage of regional over general anesthesia in orthopedic surgery is prolonged postoperative analgesia and lower incidence of postoperative complications. The following information was recorded: type of surgery, anesthetic protocol, vital signs, pain intensity (visual analog scale) at 12, 24 and 48 h, patients' satisfaction and side effects.

Results: Data of 89 (53 females, 36 males) undergoing elective total hip arthroplasty were included. A total patients of ASA physical status class II and III, mean (SD) age of 67.4 (14) years were treated with multimodal analgesia. Analyzing pain intensity in our patients we observed that during first two days postoperatively they had pain weaker than 3,5 (VAS).

Conclusions: The protocols of multimodal analgesia used for acute pain management after total hip arthroplasty provide an adequate postoperative pain control in a high percentage of patients, mainly when regional anesthesia techniques are used. Regular evaluation of postoperative pain and timely administration of analgesics reduce the intensity of the painful sensation to a minimum (VAS<4).

EFIC5-0752

Multidisciplinary pain treatments

QUALITATIVE ANALYSIS OF MALE PATIENTS WITH CHRONIC PAIN PARTICIPATING IN GENDER-SPECIFIC GROUP THERAPY

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Background and aims Although there is evidence that men and women report using different pain coping strategies, there is lack of knowledge on men living with chronic pain and what the experience of being in a group therapy setting means to them.

Group therapy has traditionally played an important role in the treatment of chronic pain in multidisciplinary pain centers, but only few studies have investigated whether gender-specific group interventions may provide additional benefits and enhanced treatment outcomes for men.

Our aim was to investigate whether the single-gender group composition would provide an enhanced sense of comfort and support and a cohesive group environment, as well as an opportunity for men to openly discuss gender-specific topics.

Methods The material consists of 8 semi-structured individual interviews with men suffering from chronic pain who attended group-therapy eight times over a period of three months.

Data was organized in NVivo and analyzed by a grounded theory approach.

Results One core theme emerged: Male sanctuary.

Three subcategories formed the theme male sanctuary. These were pain fellowship, male emotions and new insights.

All the men describe participation in the group as useful. The respondents valued the solidarity, empathy, acceptance, humour and information they gained from the others in the group.

Conclusion This study indicates that group-cohesion and mutual support allowed the men to focus on both the implications of living with chronic pain and gender-relevant topics. These advantages of single-gender group therapy can increase treatment satisfaction and treatment outcomes.

EFIC5-0777

Multidisciplinary pain treatments

SUBLINGUAL FENTANYL FOR DYSPHAGIA CONTROL AND GRADE 3-4 MUCOSITIS PAIN IN LOCALLY ADVANCED HEAD AND NECK CANCER TREATMENT WITH RT-CETUXIMAB

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14 patients with locally advanced laryngeal squamous cells cancer (N2-N3 lymph nodes involvement), have been evaluated between February and October 2014 and treated as follows: PCT induction therapy with TPF (3 cycles) followed by RT-Cetuximab.

100% of patients achieved cytoreductive response for induction therapy and received after consolidation therapy with RT-Cetuximab. 11 patients achieved complete remission and started with 3 months of follow-up. 2 patients had locally progression of disease and received rescue surgery. 1 patient with progression disease was unresectable at surgical and started BSC. RT-Cetuximab therapy has been loaded by grade 2-3 mucositis, epidermolysis for Cetuximab association, and grade 3 furunculosis treated with antibiotic. Treatment has not been stopped and patients had adherence therapy thanks to correct weight always preserved, due to good analgesic coverage guaranteed a correct alimentation. Analgesic therapy was as follows: 100 mcg Sublingual Fentanyl 1 tablet (SFT) 10 minutes before main meals and 100 mcg STF when needed and for swallowing pain (maximum 3 times a day). All patients have taken 100 mcg SFT and 100% of them benefited of it, avoiding meals suspension. Specific therapy with miconazole have been started for grade 3-4 mucositis. Adverse events due to Sublingual Fentanyl administration were: constipation in 7 patients and nausea in 2 patients.

Sublingual Fentanyl administered during the meals and when needed in association with mucositis therapy permitted in all patients a correct alimentation, weight maintenance required for perfect therapy adherence with RT-Cetuximab and no interruptions treatment. Treatment with Sublingual Fentanyl has been well tolerated.

EFIC5-0786

Multidisciplinary pain treatments

EFFECT OF LOCAL INJECTION TREATMENT OF FOOT PAIN..

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Backgrounds: 64% of people suffered from foot pain. Most of them are women's. The main reason is Morton disease, flatfoot and load arthropathy of small joints.

The aim of study was to demand the effect of local treatment.

Material and methods: We treated 50 women (age 37 ± 12.7) with foot pain lasted more then 6 month. All had different stages of flatfoot, pain 7 ± 2.1 VAS and a problems with movements. They had no vessels problems and diabetes. We divided into two groups of 25 patients each. One received traditional therapy: NSAIDs local and per os during 14 days, orthotics correction and physiotherapy. Others, in addition to standard therapy, injections of local anesthetics in accupoints and points of pain performed. We used a small dose of lidocaine 2%-1.0ml in solution of saline 1.0ml. The total amount was 2.0ml. We used a different number of points once a day, three times a week. The total number of procedures-7.

Results: in the first group we received significant decreased of pain during last two weeks up to 4 ± 0.7 VAS, in second group- 2 ± 0.9 VAS($p < 0.05$). All of the patients could walk more fluently with Local injection therapy showed high efficacy in the treatment of pain in the foot and can be used in complex therapy. out severe pain. We had no complications, except pain during the procedure in 6 patients.

Conclusion: local injection therapy showed high efficacy in the treatment and can be used in complex therapy.

EFIC5-0791

Multidisciplinary pain treatments

TREATMENT OF THE EXPRESSED RADICULAR PAIN SYNDROME OF LOW BACK PAIN IN THE PREOPERATIVE PERIOD.

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According to the European recommendations in patients with severe radicular pain syndrome (RPS) of the lower part of the back often used combine conservative therapy, where the leading role is played by invasive anesthetic techniques (IAT) and surgery.

Objective: To evaluate the efficacy of the treatment of acute IAT RPS lumbar spine in the preoperative period.

Material and Methods: prior to surgery of 25 people with severe RPS and intervertebral disc hernia were treated by drugs per os and IAT course: from 1 to 3 central (lumbar or caudal performed access with local anesthetics and "depot" of corticosteroids). The intensity of pain was assessed by the VAS.

The Results: The first time RPS intensity on the VAS was $8,4 \pm 0,7$ B. Problems with the laying of the patient in 1-st were 54%, 2-nd blockade were - 10%. After the 1st caudal blockade after 24 hours the intensity of the RPS VAS was $2,8 \pm 0,9$ B; 3-4 day - $6,8 \pm 0,9$ B for 5-6 day - $3,8 \pm 0,9$ B, which allowed significantly reduce the severity of pain and optimize the preoperative period. We had no technical difficulties in the performance of IAT and complications of therapy per os.

Conclusion: IAT harmoniously fit into the scheme of preoperative preparation and complex treatment of RPS, because they have a "focal" direction and allow pathogenic influence the cause of the disease. IAT, are more effective in the hands of an experienced professional who owns a fast technique execution procedures.

CHANGING APPEARANCE USING VISUAL ILLUSIONS IMPROVES OWNERSHIP OF THE PAINFUL HAND IN COMPLEX REGIONAL PAIN SYNDROME

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Background and aims

People with Complex Regional Pain Syndrome (CRPS) experience a diminished sense of ownership of their painful limb. Evidence of a reduction in pain when the affected limb is visually altered in size, suggests that targeting central processing by using visual illusions could restore coherence and reintegrate the disrupted limb representation.

Methods

We hypothesized that creating visual illusions via the MIRAGE system, a form of augmented virtual reality to change hand appearance, would improve ownership of the hand.

Thirty nine patients with CRPS of one arm were randomly allocated to either a control or experimental group. While both hands were placed in the MIRAGE system, the experimental intervention involved digitally making visual changes to the affected hand according to the patient's description of how they desired their hand to appear. The procedure was similar with controls except that no visual changes to hand appearance were made. Participants were exposed to the resultant image for one minute. Perceived ownership ratings of the hand were recorded pre and post intervention.

Results

Twenty participants aged 51 (mean; SD=11) with disease duration of 50 months (mean; SD=2.5) reported a significantly improved sense of affected hand ownership post illusion when compared to controls ($p = 0.02$).

Conclusion

Changing the visual appearance according to how those with CRPS would like their affected hand to look improves ownership. These findings may be clinically useful for patients with CRPS.

EFIC5-0851

Multidisciplinary pain treatments

THE CONNECTION BETWEEN ACCUPUNCTURE ANALGESIA, BLOOD PRESSURE AND HEART RATE

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Aim: The Aim of this paper is to prove or disprove the connection between acupuncture analgesia with the level of blood pressure and heart rate.

Methods: Pain intensity, heart rate and blood pressure were measured before placing the acupuncture needles, and immediately after removing the acupuncture needles.

Results: The study was conducted on 64 patients. With the Wilcoxon test, we proved a significantly lower pain intensity after acupuncture with the second, the third, fourth and seventh measurements.

The pain intensity on the VAS scale was significantly higher in the first measurement before acupuncture and as it was after acupuncture. The systolic pressure was significantly reducing pressure in the first two measurements and in the fourth and the fifth measurements after acupuncture. The diastolic blood pressure was significantly lower in the fifth and in the last two measurements. Measurements from 6-10 were significantly lower systolic and diastolic pressure before acupuncture in relation to systolic and diastolic blood pressure in the first five measurements before acupuncture. The pressure values after acupuncture were not significantly changed during the measurement. Heart rate before and after acupuncture does not change the measurements significantly, but was significantly lower after acupuncture in the first eight measurements

Conclusion: During the first five therapies acupuncture significantly reduced intensity of pain after acupuncture treatment, the level of blood pressure, and thereafter maintains the achieved level of pain intensity and blood pressure (6-10 acupuncture treatment), which were lower compared to the first measurement (1-5 acupuncture treatment).

CORE OUTCOME SET TO ASSESS EFFECTIVENESS IN MULTIMODAL PAIN THERAPY – VAPAIN PRELIMINARY CONSENSUS STATEMENT

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Introduction

Multimodal pain therapy (MPT) has been established internationally considering a bio-psycho-social perspective in diagnostic and therapy. There is convincing evidence of effectiveness of programs according to MPT. Still, the comparability of those studies is strongly limited due to the diversity of study design and outcome measurement methodology. Aim of the study is a *core outcome set* (COS) deemed necessary for medical and therapeutic decision making by an international Consensus Process according to methodological standards (OMERACT, COSMIN).

Methods

25 stake holders of MPT (patient representatives, methodological experts, physicians, psychotherapists and physiotherapists) were identified by associations.

Two rounds of online exercises were conducted prepared by a systematic review on common outcome domains. In both rounds participants were asked to rate the provided domains by their importance. After online survey a presence meeting of the stake holders was conducted, followed by an online survey to define the recommended outcome domains.

Response rates for all steps ranged from 100% to 88%.

Results

Prepared by online survey the stake holders defined eight important domains to be measured in any clinical trial: Pain intensity, Pain Frequency, emotional well-being, health related QoL, satisfaction with social roles and activities, physical activity, patients perception of treatment goal achievement, and productivity. All domains met the criteria of at least 70% agreement of stake holders.

Conclusions

The recommended domains differ compared to recommendations by other COS initiatives such as IMMPACT. This might be because of the specific therapeutic aim of MPT which focus on physical and psychological activation.

EFIC5-0860

Multidisciplinary pain treatments

GENERAL PRACTITIONER'S MANAGEMENT OF NON-SPECIFIC LOW BACK PAIN IN AN IRISH PRIMARY CARE SETTING: A PILOT STUDY

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Background and Aims

General practitioners (GPs) manage the majority of patients with chronic low back pain (LBP) in the Republic of Ireland's health system. International best practice guidelines have been established for both acute and chronic pain, however it is not known if Irish GPs comply with these recommendations. This study aims to establish GPs' treatment management strategies, and compare them to the 2006 European guidelines by Arakinson et al.

Methods

A cross-sectional online survey was conducted on a sample of Irish GPs in a single region (n=71). The survey examined GPs management strategies for LBP patients presenting at (i) initial consultation, (ii) at six weeks and (iii) four months duration. Responses were compared with the European guidelines.

Results

The response rate was 35.21 % (n=25). Results show that LBP patients comprise 7.93% of the daily GP caseload. At initial consultation GPs complied with guidelines: reassurance as to the benign nature of LBP, advice to stay active, and prescription of paracetamol and NSAIDs given. Six weeks following initial consultation GPs demonstrated increased referral to physiotherapy and prescription of opioids in line with guideline recommendations. Results at four months following initial consultation revealed the continuing adherence to the bio-psychosocial framework despite an increase in the referral to secondary care.

Conclusion

The results of this pilot study show general adherence to best practice guidelines but illustrate that the biomedical strategies become more common when faced with persistent non-resolving symptoms. However findings should be interpreted with caution due to the small non-randomised sample.

EFIC5-0862

Multidisciplinary pain treatments

MYOFASCIAL THERAPY TECHNIQUES FOR THE TREATMENT OF PAINFUL SHOULDER IN REHABILITATION

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Background and aims:

Chronic pain is a major health problem with a particular impact on the individual, health services and society. The economic impact is also important and involves costs of investigation and treatment.

In our clinic we treat an increased number of patients with shoulder pain pathology, many of them professionally active. For that reason we felt the need to adapt new therapeutic techniques in the rehabilitation treatment to determine the resolution of the disease in a short time.

Methods:

We selected a total of 20 patients treated in our clinic, aged between 45 to 60 years, with various pathologies of the shoulder (posttraumatic, degenerative). Patients were divided into 2 groups of 10.

The first group received the standard program of rehabilitation (electrotherapy and physiotherapy) and the second group received the standard rehabilitation program and myofascial therapy. The treatment was extended at 10 days for both groups.

Patients were evaluated at the start-up of treatment, 5 days later and at the end of the treatment in terms of functionality (range of motion) and pain (VAS).

Results:

It was found that 5 days after the beginning of the treatment as well as at the end of it, the patients in the second group suffered a higher improvement for both functionality and pain assessment.

Conclusions:

The use of myofascial therapy techniques helped patients to achieve better results in a shorter period of time regarding the improvement of the pain and range of motion scores, which allowed faster professional reinsertion.

EFIC5-0864

Multidisciplinary pain treatments

PATIENTS FACING CANCER AND DEATH – PSYCHOANALYSIS AT THE PAIN CLINIC OF THE BRAZILIAN NATIONAL CANCER INSTITUTE: A TOOL IN ONCOLOGICAL TREATMENT

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AIM OF INVESTIGATION – Based on Freudian observation of the impossibility to imagine one's own death, the approach to death in the research draws on literature, since Freud also noticed that through the world of fiction it becomes possible to be reconciled with death. Nonetheless, he stresses that one is reconciled not with one's own death but that of "the other". A Tolstoi's passage reads "the very fact of the death of someone so close aroused, as usual, in each one to whom he was acquainted, a happy feeling that an other had died and not oneself. There he lies, dead; not me – thought or felt each one".

METHODS – Patients (n =50) were heard during routine attendance at pain clinic. The psychoanalytical method treatment and investigation occur at the same time. Professionals listened patients experiences in the "transference relation" in view of mentioned conceptual framework and circumscribed ways to cope with the eminence of death. During the treatment the pain intensity was measured using numerical pain scale(NPS).

RESULTS – Being listened at one's afflictions opened some space to the inexorability of death to being faced. According to the NPS , this approach had important effects . Helping control pain state

CONCLUSION – When the subject take in his hands the decision to face the impossibility and the inexorability of death other ways to cope with the horror of death may be opened. This tool can be regarded as crucial means to giving patients the conditions to face the disease.

AQUATIC EXERCISE EFFECT ON PAIN ITEMS OF THE KNEE INJURY AND OSTEOARTHRITIS OUTCOME SCORE (KOOS)

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Background: Pain is the main symptom of Knee Osteoarthritis (KOA) and aquatic exercise has been indicated as an effective non-pharmacological treatment for KOA symptoms. In general, KOA pain is assessed by simple scales or by multicomponent self-reported questionnaires, mainly the Knee Injury and Osteoarthritis Outcome Score (KOOS) and WOMAC Osteoarthritis Index. Some studies had reported the effectiveness of aquatic exercise on KOOS pain dimension but not on each pain item.

Aim: This study aimed to investigate how pain items of KOOS questionnaire are affected by 3 months aquatic exercise program for overweight and obese individuals with KOA (PICO).

Methods: Eligibility criteria were 40 ≤ age ≤ 65 years; BMI ≥ 28kg/m²; clinical and radiographic KOA. Participants were randomized in aquatic exercise group (AEG) and control group (CG). Aquatic program was twice a week, 45 min each session. Pain was assessed by KOOS. Descriptive statistics and Univariate Analyses of Covariance (ANCOVA) were used as primary analyses.

Results: Final sample included 48 adults (BMI: 35.0±4.9 kg/m², age: 55±7 years), 23 in the CG and 25 in AEG. Significant group effect was found in all pain items (p <.05), except for pain frequency (P1) and pain on bending knee fully (P4). Better group effect was found in the item pain on walking (P5) (p <.001).

Conclusion: PICO aquatic program was effective in improving knee pain in seven of nine activities of KOOS, in individuals with KOA.

Trial Registration: NCT01832545

Table 1. Group effect analysis of items scores (P1-P9) of the Pain dimension of KOOS questionnaire (0-4 where 4 is the worst condition). ANCOVA adjusted for sex and BMI values at baseline.

	Control Group			Aquatic Exercise Group			ANCOVA	
	Mom1	Mom2	Changes ^δ	Mom1	Mom2	Changes ^δ	Group effect	
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	F	p-value
P1:Frequency	2.9(0.9)	2.7(0.9)	0.2(0.9)	3.0(0.7)	2.3(1.0)	0.7(1.3)	2.87	.097
P2:Twisting	1.9(0.9)	1.9(1.0)	0.0(1.1)	2.4(0.6)	1.4(1.0)	1.0(1.0)	6.41	.015**
P3: Straighten	1.6(0.9)	1.7(1.0)	-0.1(1.4)	1.9(0.9)	1.0(1.1)	0.9(1.1)	6.88	.012**
P4:Bending	2.0(1.3)	1.8(1.2)	0.2(0.8)	2.3(0.8)	1.5(1.2)	0.8(1.4)	1.97	.168
P5:Walking	1.1(0.8)	1.5(0.9)	-0.4(1.0)	1.6(0.8)	0.6(0.8)	1.0(0.9)	19.07	<.001***
P6: Up/Down stairs	2.3(1.3)	2.2(1.2)	0.1(0.9)	2.8(0.6)	1.5(1.1)	1.3(1.1)	12.49	.001**
P7:At night	1.4(1.0)	1.5(1.1)	-0.1(1.1)	1.8(0.9)	0.8(0.9)	1.0(1.2)	9.72	.003**
P8:Sitting	1.3(0.9)	1.3(1.0)	0.0(0.9)	1.6(0.8)	0.8(0.9)	0.8(1.0)	7.06	.011*
P9:Standing up	1.8(1.0)	1.6(1.1)	0.2(0.7)	2.2(0.8)	1.2(1.2)	1.0(1.2)	5.54	.023*

EFIC5-0891

Multidisciplinary pain treatments

LONG-TERM EFFECT IN ADL AFTER INTERDISCIPLINARY REHABILITATION FOR WAD PATIENTS: A MIXED-METHOD STUDY FOR DEEPER UNDERSTANDING OF PROGRAMME EXPERIENCES.

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PURPOSE:

To evaluate long-term effects in self-perceived occupational performance and satisfaction in Activities of Daily Living (ADL) for patients with Whiplash Associated Disorders (WAD) with chronic pain in an interdisciplinary rehabilitation programme, and investigate patients' opinions of programme effects.

METHOD:

A mixed-method with sequential explanatory design was used. Fifty-three patients with WAD were followed-up 12 months after discharge. The Canadian Occupational Performance Measure was used to evaluate the change in ADL and the Multidimensional Pain Inventory for psychosocial functioning. Telephone interviews, based on five structured questions about the perceived impact of the rehabilitation programme, were made.

RESULTS:

The 12-month follow-up showed significant ADL improvement ($p < 0.001$). There was less interference in ADL due to pain ($p < 0.01$), life control increased. More people worked. Interviews revealed the environment as strengthening and safe, participants felt they were met with respect. Key success factors were to be treated with respect to being part of the social context and to obtain new knowledge.

CONCLUSIONS:

Despite the absence of pain reduction the programme had initiated a process of change towards a more active life comprising both ADL and work for participants.

IMPLICATIONS FOR REHABILITATION:

Chronic pain affects the entire life for many people. Long-term effects on ADL, life control and work ability have shown positive results after an interdisciplinary rehabilitation programme based on behavioural and cognitive principles. The key success factors were to be treated with respect to being a part of a social context and to obtain new knowledge.

THE IMPACT OF THE ULYSSES COGNITIVE BEHAVIOURAL PAIN MANAGEMENT PROGRAMME ON SLEEP QUALITY IN PATIENTS WITH CHRONIC PAIN

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Background and Aims

Sleep disturbance is common in people with chronic pain. The efficacy of cognitive behavioural therapy pain management programmes (CBT-PMP) in terms of improving quality of life and reducing the pain experience is well established. There is, however, limited objective evidence for its effect on sleep quality. This pilot study will therefore investigate the impact of a CBT-PMP on sleep quality in patients with chronic pain.

Methods

In this non-randomised controlled pilot study patients on the Ulysses CBT-PMP waiting list were assigned to either the intervention group or the waiting list control (WLC) based on where they appeared on the waiting list. Sleep quality was assessed at baseline and at 12 weeks post CBT-PMP using the Pittsburgh sleep quality index (PSQI), and actigraphy (over 7 nights).

Results

Twenty three patients completed the CBT-PMP and 22 were in the WLC group. Both groups were comparable at baseline, and all had sleep disturbance. The PSQI correlated with only two of the 7 objective sleep measures (fragmentation index $r=0.34$, $p=0.02$, and sleep efficiency percentage $r=-0.31$, $p=0.04$). Significant improvements in favour of the CBT-PMP were found for PSQI ($d=0.18$) and three of the actigraphy measures: sleep efficiency ($d=0.21$), mean activity ($d=0.34$) and fragmentation index ($d=0.3$). Those in the CBT-PMP had significantly fewer mean number of wake bouts compared to the WLC group ($d=0.76$, $p=0.016$).

Conclusions

Patients attending a CBT-PMP have high prevalence of sleep disturbance, and preliminary analysis of the impact of a CBT-PMP on sleep is promising, and warrants further investigation.

EFIC5-0906

Multidisciplinary pain treatments

STOP THE PAIN PROJECT: PHYSICAL ACTIVITY AS AN AIDE IN PAIN RELIEF AND QUALITY OF LIFE IMPROVEMENT: IS IT POSSIBLE?

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INTRO: According to the WHO, 100 million people suffer from chronic pain worldwide, 14% of pain is related to joint, articulation and musculoskeletal. Chronic pain interferes directly in quality of life.

OBJ: To evaluate levels of pain and the impact on quality of life on chronic pain patients when participating in a supervised physical activity program.

METHODS: 32 patients with chronic pain in the PROJECT. Supervised physical activity 2x a week, measured for 6 months. We used a semi structured questionnaire: personal info, pain evaluation, pain treatment and quality of life.

RESULTS: Most female (87,5%), average age 67. Pain location: Low back (90%), shoulders (34%), cervical pain (28%), head ache (12,5%). Pain duration 3 yrs. Pain intensity at day 1: 50% mild pain, 31% moderate pain, 13% high intensity pain. 53 % lost their jobs, 46% lost quality of sleep, leisure and physical activity, and 9% reported impact on sexual activity. After 6 mo. of program, we had: 47% reduction of 50% in pain intensity. Quality of life, 50% improved in sleep and phys activities, 47% at leisure, 12% improvement in work. CONCLUSION: We realize that the awareness of the practice of supervised physical activity shows promising results when evaluating its impact in reducing pain, and consequently improvement in their quality of life by improving their motivation and humor. Furthermore, we noticed that the program promotes a positive social and emotional interaction in the group, reinforcing the need to maintain this program and the assessment in the long term.

EFIC5-0963

Multidisciplinary pain treatments

HEALTHY LIVING PROGRAM (HLP): DOES IT HELP IN RELIEVING PAIN, ENHANCING PHYSICAL AND PSYCHOLOGICAL HEALTH STATUS OF COMMUNITY-DWELLING FRAIL OLDER ADULTS?

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Background and aims:

Prevalence of pain is high among older adults and negatively impact their functional mobility and psychological status. We had carried out HLP to relief pain and enhance physical and psychological health status of older persons.

Methods:

A 6 weeks HLP was carried out in elderly community center; the content include impact of pain, the use of drugs and non-drug strategies for pain relief, 10 minutes of physical exercise in class, and, tips on healthy eating. Levels of frailty, pain, mobility level, hand grip, Body mass index, nutrition status and happiness status were collected before and after the HLP using validated instruments.

Results:

A total of 36 older adults (35 female and 1 male, mean ages 80.5 ± 8.3) joined the HLP. 77 % of them suffered from pain and 55% of them were either overweight or obesity. Upon the completion of HLP, there was a reduction of pain score from 3.4 (± 2) to 2.6 (± 2) on a 10 point scale; ($p > 0.5$); frailty score, hand grid and time up and go were significantly improved ($p < 0.5$), while happiness increased from 16.8 (± 4) to 18.6 (± 5), ($p > 0.5$).

Conclusions:

HLP was effective in relieving pain situations, increased happiness as well as physical conditions of community-dwelling frail older adults. To meet the needs of frail older persons and to promote functional longevity, such kind of health education program in pain relief, proper nutrition and exercise is important. It is planned to carry out the HLP for another 80 older adults in coming months.

EFIC5-1012

Multidisciplinary pain treatments

ERYTHROMELALGIA. WHAT'S NEW?

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A 18-year-old boy who suffer Primary Erythromelalgia with hands and feet affectation. First outbreak was treated successfully with sympathetic block (Dupen catheter). Patient referred to Pain Unit after many treatments as botulinum toxin, mexiletine, gabapentin and amitriptyline. But the last upsurge was resistant to any treatment. After a failed epidural block trail we implanted a spinal stimulator. Two tetrapolar cervical electrodes and two tetrapolar lumbar electrodes were implanted. After 72 hours hands recovered to normality with no pain or erythema. Feet got even worse, due to water immersion all the day. A new spinal stimulator was setting. A dorsal ganglion root electrodes were implanted in L5 roots. No recovery was observed after a week. Patient was still water immersion dependant. A new conservative trial with intravenous lidocaine was successful showing recovery en 12 hours. A intravenous perfusion of lidocaine (1 mg/kg/h) was maintained for 3 days with total recovery of feet.

Erythromelalgia still is an unknown disease. Multifactorial autonomic disorder non response to any treatment. A sodium channel disorder could be the beginning of the healing.

EFIC5-1068

Multidisciplinary pain treatments

PREVALENCE AND IMPORTANCE OF FEAR-AVOIDANCE BELIEFS AMONG BACK PAIN PATIENTS WITH AT LEAST 4 WEEKS DISABILITY

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Background and aims: Beside somatic and demographic factors affecting treatment response and outcome a lot of psychological factors (e.g. fear, anxiety and depression) interfere with the response of back pain (BP) patients to different treatment approaches.

Methods: Post-hoc analysis of responder and non-responder data from the fear-avoidance-beliefs questionnaire (FABQ) focusing on FABQ subscales physical activity, work and workplace derived from 10.000 BP patients who entered an integrated, medical treatment program after at least 28 days sick-leave due to BP.

Results: Patients who responded within 4/8 weeks showed a significant improvement (BL-W4-W8) within all FABQ-subscales [physical activity 13.9±5.8 - 10.9±6.3 ($p<0.001$) / 14.4±5.8 - 12.9±6.1 - 11.2±6.6 ($p<0.001$ each); work 18.9±10.4 - 14.3±10.5 ($p<0.001$) / 20.7±10.1 - 18.4±10.5 - 15.3±9.9 ($p<0.001$ each); workplace: 10.4±8.5 - 8.8±8.0 ($p=0.009$) / 11.5±8.4 - 10.8±8.3 - 9.4±8.2 ($p=0.043/0.012$)] in contrast to non-responders [physical activity 15.0±6.0 - 14.5±6.1 - 13.5±6.2 ($p=ns$ each); work 22.7±10.4 - 22.6±11.3 - 22.8±11.1 ($p=ns$ each); workplace: 16.6±8.0 - 16.5±7.6 - 16.4±9.8 ($p=ns$ each)]. Among all baseline parameters assessed, FABQ-subscales workplace and work have the highest negative predictive value for return to workplace.

Conclusions: Fear and fear-avoidance-beliefs are important and frequently underestimated factors influencing treatment response and outcome of treatment approaches in patients suffering from back pain.

EFIC5-0224

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

TIME TO ONSET OF ACTION OF A COMBINATION OF IBUPROFEN/CAFFEINE COMPARED TO IBUPROFEN MONO IN A RANDOMIZED, PHASE III TRIAL

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Background: To investigate efficacy and safety of a fixed dose combination (FDC) of ibuprofen/caffeine (400/100mg) versus ibuprofen (400mg) caffeine (100mg) and placebo.

Methods: Randomized, active- and placebo-controlled, double-blind, single-center, 2-stage parallel group study in patients undergoing dental surgery reporting time to meaningful pain relief and time to first perceptible pain relief via stopwatch after having received one dose of randomized trial medication. Randomization list was generated using a validated computer system.

Results: 562 patients were randomized and treated (FDC: 213; ibuprofen: 209; caffeine: 70; placebo: 70). In the FDC group median time to meaningful pain relief was 1.13 h (95%CI:0.93,1.35). Median time for Ibuprofen was 1.78 h (95%CI:1.48,2.02). In the caffeine and placebo group less than 50% of the patients reported meaningful pain relief within 8 hours. Median times to first perceptible pain relief were 0.40 h (95%CI:0.35,0.45) for FDC, 0.48 h (95%CI:0.47,0.57) for ibuprofen and 0.75 h (95%CI:0.48,1.52) for caffeine. Less than 50% of the patients in the placebo group reported first perceptible pain relief within 8 hours. FDC provided significantly faster onset of action compared to ibuprofen, caffeine and placebo in both measures. After 30 min FDC showed a pain intensity difference compared to baseline twice as high (1.8 vs 0.9 on 11-point NRS scale) compared to ibuprofen. All treatments were safe and well tolerated.

Conclusions: FDC provided significantly faster onset of action compared to ibuprofen mono based on time to first perceptible pain relief and time to meaningful pain relief.

Trial registration: clinical trials NCT01929031

Funding: Boehringer Ingelheim

DIFFERENCE BETWEEN THE AMOUNT AND TYPE OF ANALGESICS SOLD IN DRUGSTORES IN SAO JOSE DOS CAMPOS IN SUMMER AND WINTER

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Background and aims: The weather in the city São José dos Campos, located in southeastern Brazil, is subtropical with average annual temperature of 19.8 °C. In the hottest month, February, the average temperature is 22.3°C and in the coldest month, July is 15.6°C. Although the average temperature varies little between winter and summer, the aim of this study is to analyze if the use of drugs for pain relief varies in these two seasons, due to different incidence and prevalence of diseases in those seasons.

Methods: There were analyzed the number of non-steroidal anti-inflammatory drugs (NSAIDs), non-opioids analgesics and muscle relaxants, sold with or without prescription in drugstores in the city of São José dos Campos during the months of January and July, 2013.

Results: The number of units of the three kind of analgesics sold in July was 949, while in January there were sold 731 units of those analgesics. The number of units of painkillers sold without prescription was 918, exceeding by 20.5% the number of units sold with prescription that was 762. NSAIDs were the most analgesic drugs sold in the summer and muscle relaxants in winter. Diclofenac was the most sold NSAID, dipyrone was the most sold non-opioid analgesic and orphenadrine was the most sold muscle relaxant.

Conclusion: The sale of drugs for pain control was higher in winter with an increase of 29.8% compared to the summer, showing increased incidence of pain despite the small decrease in the average temperature of only 6.7°C.

EFIC5-0289

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

IBUPROFEN/CAFFEINE IS A SUPERIOR ANALGESIC COMPARED TO IBUPROFEN, CAFFEINE AND PLACEBO: A RANDOMIZED, PLACEBO-CONTROLLED TRIAL IN PATIENTS WITH POSTOPERATIVE DENTAL PAIN

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Background and aims:

To investigate efficacy and safety of a fixed dose combination (FDC) of ibuprofen/caffeine (400/100mg) versus ibuprofen (400mg), caffeine (100mg) and placebo on postsurgical dental pain. Ibuprofen and caffeine both have a well-established safety profiles over a long history of use.

Methods:

Randomized, active- and placebo-controlled, double-blind, single-centre, 2-stage parallel group study in patients undergoing dental surgery, reporting baseline dental pain intensity of at least moderate on a 4-point verbal rating scale and ≥ 5 on a 0 to 10 numerical pain rating scale. Primary endpoint: time-weighted sum of pain relief and pain intensity difference (PID) from 0 to 8 h (SPRID0-8h); secondary endpoint: SPRID0-2h.

Results:

562 patients were randomized and treated (FDC: 213; ibuprofen: 209; caffeine: 70; placebo: 70). Overall, about 58% suffered from severe pain; mean (SD) pain intensity was 7.7 (1.09).

The primary endpoint was met. Adjusted means (SE) for SPRID_{0-8h} were: FDC, 52.291 (2.027), ibuprofen, 40.165 (2.047), caffeine, 15.824 (3.525), placebo, 10.554 (3.527). SPRID_{0-2h}, values were: FDC, 10.584 (0.404), ibuprofen, 6.990 (0.408), caffeine, 2.612 (0.702), placebo, 2.059 (0.703) ($p < 0.0001$ for all comparisons of the FDC versus comparators). Even at 8h post-dose PID was larger for the FDC (4.074 (0.187), compared to ibuprofen (3.519 (0.195), $p = 0.0398$). All treatments were safe and well tolerated.

Conclusion:

Ibuprofen/caffeine 400mg/100mg reduced moderate to severe postsurgical dental pain between 0-8h more effectively compared to ibuprofen alone, caffeine, and placebo. Ibuprofen/caffeine provided 30-50% stronger pain reduction over 0-8h and 0-2h, compared to ibuprofen alone.

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EFIC5-0344

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

PHASE III TRIAL TO EVALUATE THE EFFICACY AND SAFETY OF ETODOLAC-LIDOCAINE PATCH IN THE TREATMENT OF ACUTE LOW BACK PAIN

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Etodolac-Lidocaine Topical Patch 4.4% w/w (MRX-7EAT) is a novel, selective COX-2 inhibitor, non-steroidal anti-inflammatory drug (NSAID) patch, developed by using a novel transdermal delivery system based on a proprietary ionic liquid technology. We conducted a Phase III, randomized, multi-center, double-blind, placebo controlled study in the U.S. to evaluate the safety and the efficacy of MRX-7EAT once daily application for 14 days in the treatment of acute low back pain. Subjects with the onset of the current episode ≥ 3 and ≤ 7 days and a Current Pain Intensity (CPI) of ≥ 4 but ≤ 6 on an 11-point were eligible for the trial. This study enrolled 232 subjects aged 14 years old or older at 7 sites for 6 months, from December 2013 to May 2014. The Summed Pain Intensity Difference (SPID) score change from baseline to Day 8 as the primary endpoint was numerically greater in the MRX-7EAT group vs. the placebo group. This difference was not statistically significant in the ITT population ($p < 0.068$), but did show statistical significance in the PP population ($p < 0.049$). Further, the MRX-7EAT patch performed numerically better than the placebo patch in other endpoints including treatment satisfaction and time to resolution of pain. There were no deaths and no serious adverse events (AEs). AEs affected about 13% of subjects in both groups. Most AEs were mild. Etodolac-Lidocaine Topical Patch is safe and is more effective for the treatment of pain due to acute low back pain than placebo.

EFIC5-0347

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

PECULIARITIES OF THE USE OF NSAIDS IN PATIENTS WITH RHEUMATOID ARTHRITIS AND ANKYLOSING SPONDYLITIS

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NSAIDs are widely used to control the main symptoms of rheumatoid arthritis (RA) and ankylosing spondylitis (AS). NSAIDs can also slow down AS progress. Many patients with RA and AS receive NSAIDs on a long-term continuous basis which requires adequate prevention of complications.

Study Objective: To determine peculiarities of the use of NSAIDs and the rate of gastrointestinal complications in patients with RA and AS.

Material and Methods: We examined 1084 patients with RA (80.7% women and 19.3% men, 50.9±13.9 years old) and 402 patients with AS (24.2% women and 75.8% men, 35.2 ± 10.7 years old) admitted to our clinics from 2011-2013, who received NSAIDs for ≥ 1 month at the time of examination. Total 14.3% and 16.2% of patients received proton pump inhibitors. We compared NSAIDs received by these patients at the moment of examination. All the patients underwent endoscopic examination.

Results: Patients with RA and AS differed in NSAIDs use. Thus, patients with RA received Nimesulide (43.1%), Diclofenac (17.9%), Meloxicam (16.4%) and other NSAIDs (12.0%). Selective COX-2 inhibitors were received by 10.6%. Patients with AS received Diclofenac (38.3%), Nimesulide (25.9%), Indomethacin (14.4%), Meloxicam (10.1%) and other NSAIDs (5.1%). Selective COX-2 inhibitors were received by 6.2%. Endoscopic examination showed a lower rate of gastric/duodenal ulcers in patients with RA compared to patients with AS (p<0.05).

Conclusion: Russian physicians prefer prescribing Nimesulide to patients with RA, and Diclofenac to patients with AS. Patients with AS use less safe NSAIDs (Diclofenac and Indomethacin) more often than patients with RA.

EFIC5-0348

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

RISK OF NSAIDS-RELATED COMPLICATIONS IN PATIENTS WITH OSTEOARTHRITIS VERSUS PATIENTS WITH BACK PAIN: DATA FROM A ONE STAGE CROSS-SECTIONAL EPIDEMIOLOGICAL STUDY

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NSAIDs are the main agents for pain management in patients with osteoarthritis (OA) and back pain. However, they may cause serious gastrointestinal (GI) and cardiovascular (CV) complications. Prevention of these complications is based on the evaluation of the existing risk factors.

Study Objective: To compare risk factors in patients with OA and back pain requiring NSAIDs.

Material and Methods: We conducted one stage cross-sectional epidemiological study. Total 2021 physicians from Russia-CIS conducted a survey of patients requiring NSAIDs with musculoskeletal pain (VAS >40 mm) or current use of NSAIDs. Data on 4978 patients with OA and 11990 patients with back pain were received.

Results: GI risk factors were observed more in patients with OA compared to those with back pain: history of GI bleeding: 2.0% and 1.5%, history of ulcers: 12.7% and 11.7%, dyspepsia: 30.4% and 21.3%, use of low-dose aspirin: 30.4% and 12.7%. The total number of patients with a high risk of GI complications was 31.7 and 22.1% ($p < 0.001$). A similar situation was observed in CV risk factors: a history of myocardial infarction or stroke: 10.8% and 6.2%, CHD: 30.3% and 13.2%, arterial hypertension: 56.6% and 30.1%, diabetes: 14.0% and 5.7%. The total number of patients with a high risk of CV complications was 42.2% and 20.4% ($p < 0.001$).

Conclusion: Patients with OA are older with larger number of comorbidities compared to patients with back pain. The use of NSAIDs in OA is associated with a higher risk, which requires adequate prevention or use of alternative pain-management techniques.

EFIC5-0492

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

POST-OPERATIVE ANALGESIA PRACTICES AFTER CAESAREAN SECTION SURGERY IN SOUTH AFRICA: RESULTS OF A NATIONAL SURVEY

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Background and Aims

The caesarean section rate in South Africa (SA) is high. Analgesia is important for these patients in order to ensure they have a positive post-operative experience.

The aim of this study was to determine the post-operative analgesic practices used by doctors for patients having caesarean section surgery in SA.

Methods

Following ethics approval, a national survey was conducted in SA during 2014 amongst doctors involved in the administration of anaesthesia.

Results

There were 973 respondents. 40 respondents did not meet the inclusion criteria.

76.1% (704/925) of the cohort believe that the anaesthesiologist should be responsible for the analgesic management, yet in only 62% (577/924) of the respondents' practices does the anaesthesiologist take responsibility for post-operative pain management.

The majority (91%, 853/933) of the respondents do not use epidural analgesia, citing inadequate post-operative monitoring as the most common reason why they do not use this technique.

Patient controlled analgesic (PCA) pumps are also uncommon. Only 17% (164/933) use PCA's, with morphine being the most commonly used PCA analgesic (110/164).

75% (702/933) of respondents use NSAIDs, while intravenous paracetamol is only used by 64% (601/933) of the doctors.

The majority of the respondents (76%, 712/933) feel that their patients are satisfied with their post-operative analgesia.

Conclusions

The results of this survey have revealed details regarding the analgesic prescription practices for caesarean section surgery. This survey indicates that in SA there is a trend for patients to receive systemic analgesia in favour of regional analgesic options.

EFIC5-0678

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

EFFICACY OF 0.35% INDOMETHACIN PATCH IN ACUTE ANKLE SPRAIN PATIENTS

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Background and aims

A 0.35% indomethacin patch has been approved in Japan and China as an over-the-counter product to treat joint muscle pain.

This study investigated the efficacy of the 0.35% indomethacin patch in pain relief of ankle sprain.

Methods

This was a multi-centre, randomised, examiner and subject blind, two-group, group-sequential, placebo-controlled study. Patients with acute sprain ankle were randomised to 0.35% indomethacin patch or placebo applied twice daily. Rating Pain Relief Score (PRS) and Numerical Rating Scale (NRS) were recorded. Sum of Pain Intensity Difference (SPID) was calculated based on NRS. The primary analysis was analysis of covariance performed on SPID_{1-3days}.

Results

270 subjects were randomised and included in Intent-to-Treat analysis with 245 completing the study. There was a statistically significant difference of 0.72 (22.0%) in favor of indomethacin patch on SPID_{1-3days} ($p=0.0201$). Indomethacin patch was statistically significant better compared to placebo using NRS and PRS at all time points from 12 hours after first dose to the end of Day 7 (except NRS at 24 hours after dose). Indomethacin patch had significantly less median time to onset of pain relief as compared to placebo ($p=0.0004$).

There were total 10 treatment related adverse events, five in each group, and all were at the patch application site.

Conclusions

0.35% indomethacin patch delivered shorter time to onset of pain relief and significantly pain relief from 12 hours after the first dose to Day 7 in ankle sprain patients with twice-daily use. 0.35% indomethacin and placebo patches were generally well tolerated.

PATIENT DISCONTINUATION RISK WITH TRADITIONAL NSAIDS (tNSAIDS) OR OPIOIDS VERSUS PLACEBO IN OSTEOARTHRITIS (OA): RESULTS OF META-ANALYSESA. Moore¹, S. Pandhi², R. Nixon³, R. Chaves⁴, P. Guyot⁵, A. Karabis⁶¹Pain Research, University of Oxford, Oxford, United Kingdom²Global Development, Novartis Pharma AG., Basel, Switzerland³Statistical Methods and Consulting, Novartis Pharma AG., Basel, Switzerland⁴Global Medical Affairs, Novartis Pharma AG., Basel, Switzerland⁵Health Economics & Outcomes Research, MAPI, Lyon, France⁶Health Economics & Outcomes Research, MAPI, Houten, Netherlands

Background and aims: tNSAIDs and opioids are commonly used for the management of chronic pain in OA, but there is a lack of head-to-head comparisons between these drug classes. Comparative discontinuations with placebo or active treatment allow broad comparisons between different classes, and network-meta analyses (NMAs) because of larger number of patients reduce the potential for differences driven by chance. We compared discontinuations with tNSAIDs (diclofenac, ibuprofen, and naproxen), opioids, or placebo in patients with OA.

Methods: Two NMAs were performed for tNSAIDs: (1) Systematic literature review using Medline/EMBASE/Cochrane (up to 06/2013) to identify randomized controlled trials (RCTs) for 146,524 patients in 176 studies and (2) NMA of 19 RCTs conducted by Novartis (legacy studies conducted between 1982 and 1999) including 5030 patients with OA. Withdrawal data across dose ranges were available for both analyses. Patient discontinuation with opioids was sourced from a Cochrane meta-analysis evaluating 22 trials and 8275 patients with OA (Da Costa et al. 2014) - all included opioids were pooled.

Results: In the systematic literature NMA, risk of discontinuation for all causes or lack of efficacy was lower whereas risk of discontinuation due to adverse events (AEs) was higher with tNSAIDs than placebo. The 2 NMAs were internally broadly consistent. Opioids were associated with a higher risk of withdrawal due to AEs than placebo (**Table**).

Conclusions: The potentially increased likelihood that patients will need to withdraw from therapy due to AEs with opioids compared with tNSAIDs should be taken into account in clinical decision making.

Table. Discontinuations with tNSAIDs or opioids versus placebo

Comparison Drug versus placebo	All-cause discontinuation	Adverse event discontinuation	Lack of efficacy discontinuation
Systematic literature NMA, Relative Risk* (95%CI)			
Diclofenac (all doses)	0.7 (0.6–0.8)**	1.6 (1.3–1.9) ^{§§}	0.4 (0.3–0.4)**
Naproxen	0.7 (0.6–0.8)**	1.4 (1.2–1.7) ^{§§}	0.4 (0.4–0.5)**
Ibuprofen	1.0 (0.8–1.1)	1.7 (1.4–2.1) ^{§§}	0.5 (0.4–0.6)**
Novartis legacy studies NMA, Relative Risk* (95% CI)			
Diclofenac 75 mg	0.5 (0.4–0.7)**	1.7 (0.9–3.3) [§]	0.3 (0.1–0.5)**
Diclofenac 100 mg	0.5 (0.4–0.8)**	1.9 (1.0–3.6) ^{§§}	0.2 (0.1–0.4)**
Diclofenac 150 mg	0.6 (0.5–0.8)**	2.2 (1.3–3.7) ^{§§}	0.4 (0.2–0.6)**
Diclofenac 200 mg	0.5 (0.3–0.8)**	1.9 (0.8–4.3) [§]	0.1 (0.0–0.3)**
Cochrane opioid meta-analysis, Relative Risk (95% CI)			
Opioids (all combined)	Not reported	3.8 (2.9–4.8) ^{§§}	Not reported

Key: ^{§§}=placebo more tolerable than active; [§]=placebo likely more tolerable than active; ^{*}=active likely more tolerable than placebo; ^{**}=active more tolerable than placebo; ^{*} = Rate Ratios were mapped to relative risks using the respective mean placebo rates of the NMAs (i.e., 0.28 per person-year in the SLR NMA and 0.75 in the legacy studies NMA) and a trial duration equal to the median trial duration in the Cochrane meta-analysis (i.e., 6 weeks); CI, confidence interval

EFIC5-0719

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

DIFFERENCES IN ANALGESIC USAGE AMONG NURSING, PHARMACY AND PHYSIOTHERAPY STUDENTS

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Background and Aims: Habits of analgesic usage among healthcare team may differ from normal population. Besides, members of a healthcare team may have different perspectives from each other. Therefore; this study aimed to investigate the differences in analgesic usage among nursing, pharmacy and physiotherapy students.

Methods: This comparative-descriptive study was conducted with 574 bachelor-degree students in the faculty of health sciences in a private university. The sample consisted of 144 (25.1%) nursing, 237 (41.3%) pharmacy, and 193 (33.6%) physiotherapy students. The data were collected by a survey prepared by the researchers.

Results: Regular usage of analgesics was found more than expected count in pharmacy students. The students who prefer and use alternative methods (e.g. massage) than taking analgesic as a first option were more than expected count among physiotherapy students. Nursing students were more likely to carry analgesics in their bags while physiotherapy students carrying analgesic with them less than expected count. The number of pharmacy students who reported that they always suggest an analgesic to somebody needs was found more than expected count. When the analgesic doesn't help, the pharmacy students very found more likely to increase the dosage of the same analgesic.

Conclusions: Pharmacy students have more confidence in using and suggesting analgesics in comparison with nursing and physiotherapy students. Physiotherapy students were found more likely to use alternative methods in parallel with their education. As the nursing students in this study highly consisted of females, their habits of analgesic usage may be affected by possible dysmenorrhea.

EFIC5-0889

Pain treatment (conservative): NSAIDs, COX2 inhibitors and acetaminophen

COMPARISON OF ETORICOXIB AND DICLOFENAC FOR PERIOPERATIVE ANALGESIA IN TOTAL HIP ARTHROPLASTY A SINGLE CENTER, PROSPECTIVE, DOUBLE-BLINDED, RANDOMIZED, CONTROLLED TRIAL

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Background:

Non-selective NSAIDs and selective COX-II blockers can suppress inflammatory prostaglandins and have been proven to be effective for perioperative analgesia of moderate to severe pain. We hypothesized that etoricoxib has a superior analgesic efficacy over diclofenac.

Material and Methods:

100 patients were included (50 in each group) in this trial. Etoricoxib (90 mg) was administered once and diclofenac-sodium (75 mg) twice per day for 9 days after primary cementless total hip arthroplasty (THA). In case of persistent pain, all patients received additional opioids (i.e. oxycodone, piritramide, tramadol). All patients had to record their perioperative course of pain on each day on a visual analogue scale three times a day.

Results:

The amount of additional opioids was calculated in morphine equivalents and displayed as total dosage and mean daily dosage. Total dosage (84.5 ± 73.7 in the DIC-group; 65.4 ± 47.9 in the ETO-group) and the mean daily dosage (19.1 ± 5.5 in the DIC-group; 16.9 ± 5.0 in the ETO-group) were not statistically different. The number of patients in each group who needed additional opioids (22 in the DIC-group; 28 in the ETO-group) and duration of use (4.1 ± 3.1 days in the DIC-group; 3.8 ± 2.6 days in the ETO-group) were not statistically different between the two groups. The number of adverse and serious adverse events was not significantly different.

Conclusion: There was no superior analgesic efficacy of etoricoxib over diclofenac in patients after primary THA. Both drugs offered an equally high analgesia and had a good tolerability, which was not different between groups.

VALIDATION OF A MULTI-CRITERIA DECISION ANALYSIS (MCDA) FOR ASSESSING THE BENEFIT AND RISK (B/R) OF OTC ANALGESICS

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Background and aims: An expert group developed an MCDA model to assess the benefit / risk balance of six commonly used OTC analgesics listed in table 1.

Methods: A group of experts provided initial evidence for benefit and risk for the six therapies on three favourable effects and eight unfavourable effects. An additional external panel of experts subsequently reviewed quality and interpretation of data used in the model. A secondary sensitivity and correlation analyses was performed; incorporating new data.

Results: Overall weighted preference scores remained within 3/100 for all analgesics except for diclofenac and aspirin. Ibuprofen-S remained the most preferred of these six, scoring 100 on three of the most heavily weighted effects – overdose toxicity, pain relief and speed of onset, which together scored 79 out of its total of 93. Sensitivity analyses confirmed that the model is very robust to differences in clinical judgements.

Conclusions: Ibuprofen-S stands as most preferred over a wide range of effect criterion weights. Its benefits are overall better than the other five drugs, and, with ibuprofen-acid, safety is better than the other four. Naproxen stands in second place, performing somewhat less well on pain relief, speed of onset and overdose toxicity, but better than Ibuprofen-S on duration of action. Paracetamol and diclofenac show moderate benefits but paracetamol is much lower for safety. Aspirin is the poorest for both benefits and safety. The model provides a robust analysis tool to assist prescribers and patients choose an OTC analgesic for acute pain.

Product	before	after
Ibuprofen salts & solubilised (S)	93	94
Naproxen	80	83
Ibuprofen acid	55	57
Diclofenac	31	54
Paracetamol	39	38
Aspirin	28	13

Table 1: Before and after peer-review scores

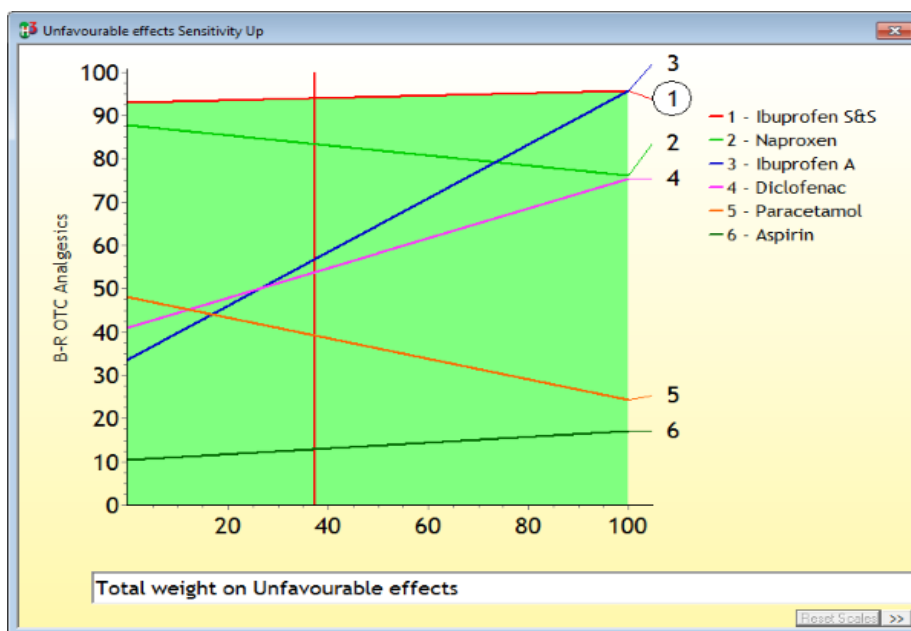
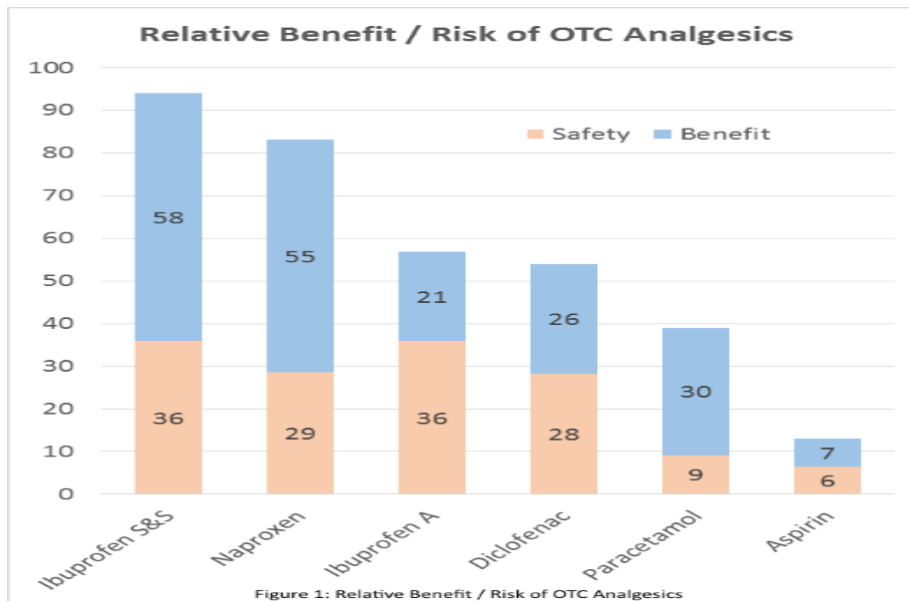


Figure 2: The weight on Unfavourable effects is shown by the vertical red line. Increasing or decreasing it over the entire range leaves Ibuprofen S as most preferred

EFIC5-0981

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

PREVALENCE OF WORK-RELATED MUSCULOSKELETAL PAIN AMONG STAFF OF A NIGERIAN UNIVERSITY: A CROSS-SECTIONAL STUDY

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Background: Musculoskeletal pain contributes to unproductive service delivery in any organisation. However, few studies have investigated the prevalence of Work-Related Musculoskeletal Pain (WRMP) among university staff in Nigeria. The purpose of this study was to investigate the WRMP among staff of a Nigerian tertiary institution.

Methods: This cross-section survey recruited 260 respondents (110 academic and 150 non-academic staff) of the Obafemi Awolowo University, Ile-Ife, Nigeria using a multi-stage sampling technique. Data on socio-demographic characteristics were obtained while WRMP was assessed using the Nordic Musculoskeletal Pain questionnaire. Data were analysed using descriptive and inferential statistics. Alpha level was set at $p < 0.05$.

Results: The mean age of respondents was 45.7 ± 10.2 years. The prevalence of WRMP among academic and non-academic staff were 71.7 % and 63.0 % in the last 12 months respectively. Of all WRMP, neck pain constitutes about 41.9% followed by low-back and shoulders pain were 40.0% and 22.5% respectively. Almost half, 45.2% identified prolonged sitting as a major cause of pain while 11.0% were absent from work due to pain. Significant relationships were found between pain intensity and each of pain occurrence ($r=0.517$; $p= 0.001$ and $r = 0.789$; $p=0.001$), pain duration ($r=0.641$; $p= 0.001$ and $r=0.702$; $p=0.001$) and absenteeism due to pain ($r=0.262$; $p=0.049$ and $r=0.380$; $p=0.001$) among academic and non-academic staff respectively.

Conclusion: Prevalence of work-related musculoskeletal pain among staff of the Obafemi Awolowo University, Ile – Ife, Nigeria is high and prolonged sitting was identified as a major contributing factor.

THE DISTRIBUTION OF MYOFASCIAL TRIGGER POINTS ON PATIENTS WITH CHRONIC TENSION-TYPE HEADACHE

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Background and Aim: Chronic tension-type headache (CTTH) may associate with myofascial trigger points (TrPs) presenting on the areas of head and neck muscle. Aim of this study need to compare the common location and distribution of TrPs in these body regions among CTTH with healthy subjects.

Methods: A hundred and six participants, 53 CTTH subjects and 53 age-and gender-matched controls were studied. To identify the location of TrPs; The left/right sides of the areas of head, upper back, neck, and shoulder were divided into 4 regions. The Simons' diagram of referred-pain zone was used to identify each specific muscle having trigger points on manual palpation. Pressure pain threshold (PPT) was measured on the most painful trigger point using a digital algometer.

Results: The average numbers of active TrPs on the left/right upper neck and occiput for the CTTH showed a significant greater than the healthy group ($p < 0.05$). In term of the most 3-common muscle having active TrPs, in CTTH found mostly in right temporalis muscle (62.26%), right suboccipital muscle (60.38%) and left suboccipital muscle (58.49%), respectively, While in control group found only tenderness points. In addition, the lowest PPT in CTTH was presented in both side of temporalis muscle (0.69 ± 0.24 kg/cm² on left and 0.74 ± 0.29 kg/cm² on right).

Conclusion: The active TrPs on the area of upper part of head and neck, mostly in temporalis muscle may be the possible cause of CTTH. These results may provide more information for developing the effectiveness therapeutic for CTTH.

IS INTRAEPIDERMAL NERVE FIBER DENSITY A RELIABLE BIOMARKER OF PROGRESSION IN PAINFUL AND PAINLESS DIABETIC NEUROPATHY?

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Background

Intraepidermal nerve fiber density (IENFD) was found to be a useful marker of disease progression in diabetic neuropathy (DPN) using 6-month interval (Narayaswamy et al. 2012). We aimed to confirm this observation in patients with early type 2 diabetes mellitus (DM2) using longer time interval.

Methods

In a group of 23 healthy subjects (median age 57 years, 14 men) and 30 DM2 patients (median age 60 years, 17 men) with short duration of diabetes (<3 years), we serially evaluated skin biopsies from distal leg using IENFD of PGP 9.5-immunoreactive fibers. Eighteen DM2 patients complied with the criteria of symptomatic diabetic polyneuropathy (DPN), 9 of them with painful and 9 painless form, and 12 had no neuropathy (nDPN). Time interval between biopsies were >2 years (median, range: 29.6, 24.7-58.4, and 33.8, 25.5-54.1 months in controls and DM2 patients, respectively).

Results

At first skin biopsy, the IENFD was normal in all controls (mean [SE]: 9.5[0.7] fibers) and nDPN patients (7.9[0.9]), compared to abnormal IENFD in 77.8% of DPN patients (3.4[0.9]). Drop in IENFD expressed as a proportion of the 1st IENFD value in % per year in both painful and painless DPN patients was significantly higher (11.95[3.82]/year, $p < 0.001$) compared to control subjects (1.92[1.81]) and similarly to DM2 patients without DPN (12.16[4.38]).

Conclusion

Decrease in IENFD values in early DM2 patients is about 12% of the initial IENFD value irrespective of symptoms and/or signs of DPN at initial evaluation and several times quicker compared to healthy subjects.

VALIDATION OF THE FRENCH VERSION OF THE « PATTERNS OF ACTIVITY MEASURE » IN CHRONIC MUSCULOSKELETAL PAIN PATIENTS

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Background

Activity patterns "avoidance", "pacing" and "overdoing" are known to have influence on chronic pain and disability. The "Patterns of Activity Measure" (POAM-P) is a self-administred questionnaire whose aim is to assess these patterns. Our objective was to validate a French version of the POAM-P (POAM-P/F) in chronic musculoskeletal pain patients.

Methods

A single-center prospective study is currently conducted in the « Clinique Romande de Réadaptation-suvacare », in the French speaking part of Switzerland. Four hundred rehab inpatients admitted for chronic musculoskeletal pain after traumatic injuries have already been included.

Data collected include pain localization and the following questionnaires: POAM-P/F, TAMPA Scale for Kinesiophobia, subscales of the Chronic Pain Coping Inventory, Pain Catastrophizing Scale, Brief Pain Inventory and Hospital Anxiety and Depression Scale.

As a part of the whole study, the recommended procedure for translation and transcultural adaptation of questionnaires was followed to validate the POAM-P/F: translation and back translation by an expert committee, pretesting, validity and reliability.

Results

Face and content validities were checked during the transcultural validation process. On the four hundred first patients included, criterion and construct validities were satisfactory ("Avoidance" scores better correlate with TAMPA than "Pacing" and "Overdoing" scores do; respectively, $r=0.52$, $p<10^{-6}$, $r=0.23$, $p<10^{-6}$, $r=-0.29$, $p<10^{-6}$; there are three distinct dimensions on the confirmatory factor analysis), as well as reliability (Intraclass Correlation Coefficients range 0.78-0.82).

Conclusions

POAM-P/F is about to be validated. The next step will be to explore the possibility of fitting the rehabilitation program to each patient according to its activity pattern.

INTERNATIONAL VALIDATION STUDY OF THE ALGOPLUS SCALE IN FIVE LANGUAGES

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Background and aims

Acute pain is frequent and underestimated in elderly patients, especially when these patients suffer from cognitive disorders. Algoplus® is one of the few validated scales for acute pain evaluation in patients with communication disorders. We present the validation by expert teams of Algoplus® in 5 languages: Spanish, English, Italian, Portuguese and Turk.

Methods

After translation of the scale according to international recommendations, 50 patients have been included for each language in Spain, Australia, Italy, Portugal and Turkey. Test-retest (the scale is administered by the same trained clinician, on two occasions four hours apart) and inter-rater (2 physicians assess pain independently) reliabilities have been evaluated with the Pearson and the Intra-class correlation coefficients. Kappa statistics were calculated for each item of the Algoplus® scale. Appreciation of the scale by the clinicians was also evaluated.

Results

For the five languages, Pearson and intraclass correlation coefficients are >0.80 (good to excellent) and Kappa statistics are also excellent (range 0.80-0.98).

Discussion

Results show that reliability tests and correlations are good or excellent for all 5 languages. The scale is also considered to be clear, requiring a very short time to be administered. This study provides evidence that the Algoplus® scale is a reliable and easy to use instrument: it brings a unique opportunity to include the translated Algoplus® scale in daily assessment of elderly persons with communication disorders in many countries.

EFIC5-0313

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

COMPARISON OF ONCOLOGY PATIENTS' AND THEIR FAMILY CAREGIVERS' ATTITUDES AND CONCERNS TOWARDS PAIN AND PAIN MANAGEMENT

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Background and aim: Both cancer patients and their family caregivers (FCs) report concerns about pain and pain management. When dyads share appraisal of the illness context, they may experience better dyadic adjustment. The aims were to compare oncology outpatients' and their FCs' attitudes and concerns towards pain and pain management.

Methods: In this cross-sectional study, outpatients with pain (n=71) and their FCs completed the Barriers Questionnaire II (BQ-II), Brief Pain Inventory, and information about demographic characteristics. Correlations and paired sample t-tests were done to evaluate the strength of the associations and differences in barriers scores between the patients and their FCs.

Results: Congruence was found in patients' and FCs' beliefs about pain and the use of analgesics on four out of seven BQ-II subscales (i.e., tolerance, immune system, side effects, distract the medical doctor) and on the BQ-II total score. Both patients and their FCs were most concerned about addiction.

Conclusions: Both patients and their FCs have concerns about pain and the use of analgesics that may act as barriers to effective pain management. However, only small differences were found in concerns between the patients and their FCs.

CANCER PAIN RELIEF AT 24H AND 48H AFTER ADMISSION

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Background and Aim. Humanized care requires fast and effective relief of symptoms. The aim of this study was to determine the pain relief in palliative cancer patients at the first 48 hours after admission.

Method. Convenience sample comprising 286 consecutive adults admitted in one general and one oncology hospital, from 2012 to 2013, with pain ≥ 4 (0-10). All the patients were assessed three times: at admission (0h), at 24h and 48h from admission about pain intensity (0-10). Analyses were performed to calculate the pain frequency and intensity reduction in the period. Q Cochran and Generalized Estimating Equations tests were used. Level significant adopted was 95%.

Results. Pain occurred in 76% of patients at admission and declined to 59%(CI95% 53-66;p<0.0001) after 24h and to 58%(CI95% 50-65;p<0.0001) after 48h from admission. Mean of pain intensity was 7.12(CI95% 6.81-7.43) at admission, 4.01(CI95%3.52-4.56) at 24h and 3.85(CI95%3.32-4.47) at 48h.The mean differences in pain intensity showed a reduction of 3.11(CI95% 2.54-3.68; p<0.0001) at 24h and 3.26(CI95% 2.66-3.87; p<0.0001) at 48h from admission. No difference was found for all comparisons between 24h and 48h.

Conclusion. Marked reduction in pain frequency and promising pain relief was achieved after 24h from admission, but no improvement occurred after 48h; at this point, residual pain was still 3.8 (0-10). The literature lacks information about how much time is necessary to achieve acceptable pain relief and about how much pain relief we can expect for advanced cancer patients.

Supported by: CNPQ

EVALUATION OF THE IPHONE PAIN ASSESSMENT APPLICATION FOR USE IN THE PARAMEDIC PRE-HOSPITAL SETTING: TO IMPROVE PAIN ASSESSMENT IN PEOPLE WITH DEMENTIA

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Aims

Pain assessment in older adults with cognitive impairment is often a challenge and paramedics are not given sufficient tools/training to assess pain. The development of this App may improve pain assessment, and in turn management, in this vulnerable population. The aim of this study was to evaluate the use of the iPhone pain assessment application as a tool for use in clinical paramedic practice to improve pain assessment of older adults with cognitive impairment.

Methods

Focus groups with paramedic students and a Delphi panel of qualified paramedics were conducted. Participants looked over the app and the paper-based algorithm from which the App was developed. The potential use for the App was discussed. Focus groups were recorded and transcribed verbatim, analysed using a framework approach. Proposed recommendations were disseminated to the Delphi panel who reviewed the App and recommended changes.

Results

24 paramedic students from two UK ambulance services attended focus groups. The overall opinion of the pain assessment App and its potential were very positive. Recommended changes were grouped into three key areas: Use of technology in paramedic setting; Specific App based changes; General changes. The Delphi panel subsequently ordered the changes in terms of priority.

Conclusion

Results indicate that the iPhone pain assessment App provides a useful tool in the pre-hospital setting. By providing access to a tool specifically developed to help identify/assess pain in a user-friendly format, we are likely to see improvements in pain management and subsequently improved quality of life for the adult with dementia.

CONDITIONED PAIN MODULATION IN HEALTHY VOLUNTEERS EVALUATED WITH A NEW CUSTOM-MADE QUANTITATIVE COLD PAIN STIMULATOR

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Background and aims: Cold pain stimulation is the most efficient conditioning stimulus (CS) to induce conditioned pain modulation (CPM). Recently we developed a compact quantitative cold pain stimulator (QCPS) to deliver tonic cold stimulus at regulated constant temperature (0-32°C) to a 16cm² area. The aim of the study was to investigate whether QCPS is sufficient to induce CPM in healthy volunteers.

Methods: QCPS consists of a thermode with a ceramic contact plate (40x40mm) cooled by a Peltier element ($I_{\max}=8A$, $V_{\max}=15.4V$, $Q_{\max}=76W$; Hebei International, China) regulated by a thermistor (103JT-100; SEMITEC, JAPAN) feedback and a microcontroller (PIC24FJ64GA004; Microchip Technology, USA). Ten healthy subjects participated. Tonic cold CS was applied to the left forearm by QCPS with a pain intensity of VAS7/10. Pressure pain threshold (PPT) was measured as test stimulus (TS) using the electronic pressure algometer (AIKOH Engineering, Japan) at right forearm before, during, and 10 min after CS. The application of CS was started 3 minutes before TS measurement until the end of the measurement (for 6 min). CPM effect was defined as $\{(PPT \text{ during CS}) / (PPT \text{ at baseline}) - 1\} \times 100 (\%)$ and was analyzed by ANOVAs.

Results: The target temperature was obtained in 60-130sec and was kept constant ($8.2 \pm 0.5^\circ C$) with a pain intensity of VAS6.9 $\pm$ 0.1. PPT at baseline and during CS were 156.7 $\pm$ 11.3kPa and 237.3 $\pm$ 14.3kPa, respectively. Significant positive CPM effect (53.8 $\pm$ 6.3%; $P < 0.001$) was detected compare to baseline (0.0 $\pm$ 0.0%).

Conclusions: The custom-made QCPS is sufficient to induce CPM in healthy volunteers. The compact QCPS is easy for clinical bedside use.

EFIC5-0428

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

RECEIVING ANALGESICS IN LONG-TERM CARE: THE ROLE OF COGNITIVE IMPAIRMENT

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Background and aims

Analgesic treatment in long-term care may be moderated by the residents' ability to communicate their needs. Communication skills are known to decrease with advancing cognitive impairment. Therefore, the aim of this investigation is the comparison of medication treatment for pain in nursing home residents relative to their cognitive state and ability to articulate pain.

Methods

Data stems from the baseline of a non-experimental pre-post-study in 12 Austrian nursing homes. A cross-sectional analysis of residents' pain and their medical documentation (n=425) was carried out. Residents were first divided into two groups dependent on their cognitive state. Cognitively impaired residents (MMSE

Results

Cognitively less impaired residents (MMSE >18) are more likely to receive analgesics (p

Conclusion

Results point towards an undertreatment of cognitively impaired residents, especially those unable to communicate their pain verbally. Since this vulnerable group is at risk to get no analgesics if in pain, the need for particular attention and action regarding their pain-treatment is indicated.

EFIC5-0464

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

MEPROBAMATE AND CODEINE PHOSPHATE AS CONSTITUENTS OF COMBINATION ANALGESICS: OVERVIEW AND USAGE PATTERNS IN SOUTH AFRICA

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Background and aims: The South African analgesic market contains a variety of combination (polycomponent) analgesics. Two of the active ingredients in these combinations are currently under review, namely meprobamate and codeine. The primary aim was to report on recent developments with respect to meprobamate and codeine, and to report on studies conducted on their prescribing and use.

Methods: Legislative changes to the scheduling status of meprobamate and codeine were reviewed, as well as South African drug utilisation studies on the prescribing and use of combination analgesics.

Results: The scheduling status of meprobamate is currently under review with the possibility of introducing stricter controls on its availability. In February 2015, the quantity of codeine dispensed was limited and scheduling changes were also made to codeine-containing products in an attempt to prevent their abuse. More than 130 combination analgesics under different branded generic names are available in South Africa, with especially two combinations dominating the market. There are, for example, 21 Schedule 5 (prescription-only) tablet formulations containing 320mg paracetamol, 8mg codeine phosphate, 32mg caffeine and 50mg meprobamate. Similarly, there are 13 Schedule 2 over-the-counter pharmacy-only analgesics containing 450mg paracetamol, 10mg codeine phosphate, 30mg caffeine and 5mg doxylamine. In a study conducted on 2011 data which included 31 854 patients, 62.10% of the products in ATC category N02 were analgesic combinations, and 20.85% were analgesic combinations with meprobamate. These products also contained codeine.

Conclusions: Health care practitioners should be conscious about the benefits and risks of the active ingredient combinations in pain management.

CORE OUTCOME MEASURES FOR COMPLEX REGIONAL PAIN SYNDROME CLINICAL TRIALS (COMPACT): DEVELOPMENT OF A CORE MEASUREMENT SET.

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Background and Aims

Complex Regional Pain Syndrome (CRPS) is a chronic pain condition. Currently, synthesis of clinical trial evidence is limited as there is no standardised core measurement set of internationally agreed outcome measures. An international consortium of patients, clinicians and researchers was established in 2013, under the auspices of the IASP CRPS Special Interest Group, to agree on a minimum core set of outcome measures advocated for use in all CRPS clinical trials.

Methods

Four workshops informed the development of the first core measurement set using an iterative process of consensus. Attendees (range 15-27 per workshop) comprised patients, clinicians and researchers recruited from the global CRPS community via email. Workshop (W) 1 established the research question and core domains to be evaluated. W2 agreed constructs within the domains. W3 identified preliminary instruments for the first draft core measurement set. Supplementary work included a systematic literature review, modelling of potential measurement sets, teleconference and email correspondence to the wider group. W4 in August 2015 will consider the presentation and content of the final draft set.

Results

Key domains for evaluation in CRPS clinical trials were agreed by consensus as: pain, disease severity, participation and function, emotional and psychological function, self-efficacy, catastrophizing, and patient's global impression of change. The first draft core measurement set will comprise existing instruments integrated with an established item bank of outcome measures.

Conclusions

The development of COMPACT will facilitate multi-centre international collaborations that use a common dataset, to advance our understanding and treatment of CRPS.

NURSES' ADHERENCE WITH USING A PAIN MANAGEMENT ALGORITHM IN INTENSIVE CARE UNIT PATIENTS

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Background and aims. While many patients in intensive care units (ICU) experience pain, an evidence-based algorithm for pain management does not exist. Therefore, a pain management algorithm was developed and implemented in three ICUs. The aim of this study was to evaluate nurses' level of adherence with the algorithm and associations between level of adherence and patient and unit characteristics.

Methods. The algorithm was used in patients ≥ 18 years of age who could express their pain (i.e., by self-report or by observation of behavior). Regression analysis was used to evaluate associations between nurses' level of adherence with the algorithm and patient and unit characteristics during the first six days of each patient's ICU stay.

Results. In total, 285 ICU patients' pain was assessed using the algorithm. Overall, nurses' level of adherence with the algorithm was 73.5%. Adherence rates were lower on the evening and night shifts compared to the day shift. Males were assessed significantly less frequently than females. Patients with 'injury, poisoning, or certain other consequences of external causes' were assessed significantly less frequently than patients with 'diseases of the respiratory system'.

Conclusions. Findings from this study suggest that ICU nurses can learn to use a pain management algorithm on a consistent basis. Nurses must be aware that both gender and diagnoses can impact the number of times they assess an ICU patient's pain.

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ADAPTATION OF SAN SALVADOUR SCALE FOR PAIN ASSESSMENT IN NON COMMUNICATING DISABLED PERSONS

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Background and aims: The assesment of pain in non communicating or multiple disabled persons is very difficult, especially in Tunisia. The aim of this study is to present the interest of the translation of French San Salvadour Scale (SSS) in Tunisian Arabic dialect in order to assess pain in persons with multiple disabilities and to help the care givers to diagose pain as well as to prevent it.

Method: The French SSS consists in 10 questions (noted from 0 to 4) describing the patient's usual behavior; this information is obtained either from the child's parents or from the caregivers. The total scores are between 0 and 40; from 6, the pain is present and should be treated. Translation and cultural adaptation of SSS have been done in 2014 and tested within a group of 30 non communicating or multiple disabled persons. These persons were also assessed by clinical examination, environmental factors, Functionnal Independance Measurement (FIM).

Results: The group was heterogeneous, with multiple disabilities (mental, motor, sensorial disabilities), acquired disability in 30% - congenital in 33%, with extreme ages ranging from 1 to 50 (3 infants, 13 children, 14 adults) and sex (17 Male / 13 Female), with FIM < 80/126, requiring a permanent third person. The completion of the test lasted 10 minutes. This scale diagnosed better pain. The treatment of pain was multidisciplinary.

Conclusions: The San Salvadour Scale translated into Tunisian Arabic dialect is valid, reliable, and useful within an acceptable time with caregivers of multiple disabled persons; it may be developed.

EVALUATION OF FORWARD HEAD POSTURE IN STATIC AND DYNAMIC POSTURE CONDITIONS

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Reliable assessment of forward head posture (FHP) has been an important issue for the efficient rehabilitation of head/neck disorders; no standardized evaluation methods have yet been developed.

This study was to quantitatively evaluate the effects of body posture on head position to understand how the FHP assessment is influenced by patient's such body posture conditions as sitting, standing, and walking.

This research was a within-subject experimental study.

A total of 20 asymptomatic participants were recruited and their head position relative to the upper back were measured in 3 different dimensions (craniovertebral angle, horizontal gap between the tragus and the 7th cervical vertebra, and horizontal gap between the tragus and the acromion processes) 3 times per dimension in 7 different body posture conditions (comfortable sitting and standing, upright sitting and standing, walking at 4 km/h and 6 km/h, and running at 8 km/h).

The 3 head position dimensions differed significantly ($p < 0.001$) between posture conditions. Standing posture conditions and upright upper body conditions resulted in the smaller craniovertebral angle and horizontal gap values than sitting or comfortable posture conditions. Test-retest reliability by Cronbach's α -value was high ($\alpha > 0.9$) for all dimensions, regardless of the body posture condition.

Study results do not indicate the validity of the 3 head position dimensions in assessing the severity of FHP.

FHP assessment method in clinics needs to be standardized to minimize the effects of body posture conditions. Assessment in dynamic conditions such as walking could produce more reliable outcomes in repetitive evaluations in rehabilitation treatment.

PAIN QUESTIONNAIRE: NEUROPATHIC PAIN OF ONCOLOGIC PATIENTS

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Introduction

Approximately 40% of oncologic patients with intermediate stages of the process and 60–87% of them with the disease generalization suffer from different degrees of pain syndrome. Herewith, 10-20% of patients suffer from intractable pains which can't be stopped using existing schemes recommended by WHO [1]. The amount of oncologic patients suffering from neuropathic pain ranges from 15 to 70 % [2].

Purpose

- 1.To study the structure of existing forms and questionnaires for the diagnosis of neuropathic pain;
- 2.To evaluate sensitivity and specificity of existing questionnaires;
- 3.To describe the possibility to use the existing questionnaires for diagnosis of neuropathic pain in oncologic patients;
- 4.To create a specific questionnaire to evaluate neuropathic pain in oncologic patients in the light of specific features of pathogenetic mechanisms of pain in cancer patients.

Methods

- 1.Advanced search of published data in databases RubMed, Elsevier, Embase, Scopus, AMED and Cinhal.
- 2.Methods of empirical investigation: comparison and material modeling.

Expected Results

1. Existing questionnaires to assess neuropathic pain without pathogenetic specificity in oncologic patients.
2. It is necessary to create a questionnaire to evaluate neuropathic pain in oncologic patients in the light of earlier pain medication usage, current and planned treatment, that will enable to improve the efficiency of pain control and improve the quality of patient's life.

Disclosure

- 1.The author has created the questionnaire to evaluate the neuropathic pain, which was adapted for oncologic patients. Intellectual property right was registered.
- 2.The specific questionnaire is currently being tested for sensitivity and specificity.

ANALGESIC PRESCRIPTION HABITS AMONG PHYSICAL AND REHABILITATION MEDICINE SPECIALISTS IN A TERTIARY HOSPITAL

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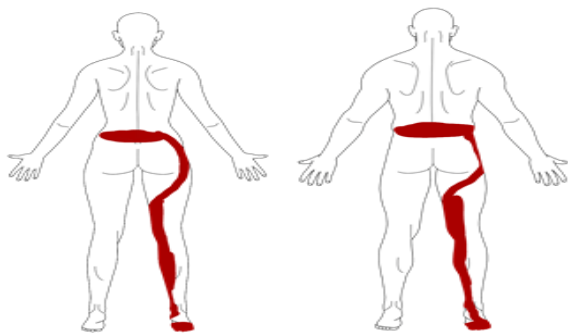
BACKGROUND: Physical medicine and rehabilitation specialists in Eastern European countries still rely to a on physical modalities when treating pain. **AIM:** The aim of this study was to determine the habits of physical medicine and rehabilitation specialists (PRM) in the prescription of analgesics. **METHODS:** We performed a retrospective study that included outpatients treated at the Clinic for Physical Medicine and Rehabilitation, Clinical Center Serbia in Belgrade, during a 3 month period. The assessment was performed by patient reports analysis. **RESULTS:** 340 outpatients (mean age of 43.52+/- 4.32 years) were included. Our patients suffered most frequently from degenerative spine disease (32.6%), followed by extra- articular rheumatism(14.7%), post operative conditions(14.7%), soft tissue injuries(14.4%), fractures (13.2) and osteoarthritis of peripheral joints (10.3%). PRM specialists did not use any validated pain scale in 87.1% of cases to measure pain intensity. Most patients (89.1%) where prescribed physical modalities, while 42.1% received an analgesic, 38.5% received a combination of analgesics and a physical modality. The most often prescribed analgesics were NSAIDs (26.5%, Topical analgesics in 15% patients, followed by paracetamol in 9.7% of cases, Co-analgesics in 2.8% of all patients, while opioid analgesics in only 1.5% of all cases. Amongst our patients, 2.4% were advised to use analgesics optionally. **DISCUSSION:** This study has shown very low percentage of analgesics usage and measured pain intensity. For most patients physical modalities are prescribed, while opioids were prescribed sparsely. **CONCLUSION:** Pain education amongst PRM specialist is very important in order to improve medical treatment of painful musculoskeletal conditions.

DOES GENDER SPECIFIC BODY CHARTS FACILITATE MEASUREMENT AND COMMUNICATION OF PAIN? A PATIENT'S PERSPECTIVE.

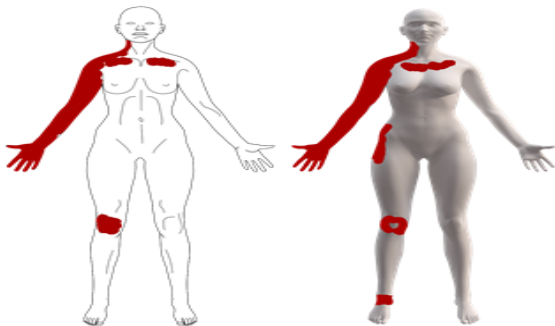
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Background and Aim: Chronic pain is more prevalent amongst women; however the majority of standardized pain drawings for the purpose of documenting pain area and location are male-like androgynous body representations. The purpose of this study was to assess whether gender-specific body schemas facilitate the communication of pain. The aims of this study were to investigate the user-experience and level of agreement between pain areas drawn on 1) line drawings of male and female body-schemas and 2) female line drawings and matching high-resolution 3D body-schemas. **Method:** A convenience sample of 82 female patients with chronic pain (heterogeneous diagnosis, duration > 2 yrs.) was equally divided the two sub-aims. Using a mixed-methods cross-over design patients were asked to provide detailed drawings of their current pain on a computer tablet. **Results:** Level of agreements were high (Aim 1: ICC=0.981, Aim 2: ICC=0.986). Only 6/41 patients preferred the male line drawing, and this was due to a larger representation of a body region in the male drawing (e.g. neck). Preference for line drawings to 3D body schema was 18:23, respectively. The 3D body-schema was report to be too human and did not allow for deep pain to be expressed, whereas others reported that the detailed contours of the musculature and skeletal structure enabled a more accurate expression. **Conclusion:** The option of gender specific body-schemas may facilitate communication and line drawings and 3D body-schemas should be used accordingly.



Male vs. Female



Line drawing vs. 3D body-schema

EFIC5-0773

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

APPRAISING THE TRANSLATIONAL RELEVANCE OF EFIC'S TOPICAL WORKSHOPS

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Background and aims: EFIC® is a multidisciplinary pain research organization, representing 36 European countries of IASP®. EFIC's 9th Congress, *Translating Evidence into Practice*, showcases the pursuit of clinically relevant research and translation of basic science into practice. To encourage discussion and debate in this area, key topical workshops were chosen by the scientific committee. This paper aims to describe the selected workshops and their translational significance.

Methods: 33 workshops were selected from 139 submissions. Workshops were described based on demographics, scientific rating, and knowledge translation (KT) scores. KT involves two key challenges; the conversion of fundamental basic science into interventions of proven value (KT1), and the incorporation of evidence-based interventions into routine practice (KT2). Each workshop was categorised as KT1 or KT2 and scored regarding how much of the workshop information addressed KT with respect to the topic as well as the findings and recommendations.

Results: In total the 33 workshops include speakers from 20 different countries and span many different topics (Figure 1-2). The workshops were categorized into 3 groups; KT1 (40%), KT2 (23%) or both (33%). All proposals included some information relevant to KT; overall ratings of KT relevance were moderate across groups, with 34% of workshops scored as highly KT-relevant and 55% scored as moderately KT-relevant. Only 10% were scored as having minimal information related to KT however this corresponded with a lack of reporting within the proposal itself (Figure 3).

Conclusions: These results are promising for providing a constructive KT platform for researchers and clinicians.

VALIDITY OF MODIFIED VERSIONS OF THE PAIN MANAGEMENT INDEX

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Background and aims: The Pain Management Index (PMI) is an indirect measure of the adequacy of pain treatment. A drawback of the index is that it only includes non-opioids and opioids. The aim of the study was to explore whether modified versions of the PMI, including neuropathic pain medications and local-anesthetics, are valid measurements of the adequacy of pain treatment.

Methods: This was a descriptive point-prevalence study. Participants were 282 medical and surgical patients, ≥18 years old, hospitalized ≥24 hours, alert and capable of participation. Data were collected with the American Pain Society outcome questionnaire and from medical records. Four PMI versions were calculated: The Cleeland-version (prescribed treatment, PMI-C), the Ward-version (administered treatment, PMI-W), and both versions modified to include medications for neuropathic pain and local-anesthetics (PMI-Cn & PMI-Wn).

Results: The mean age of participants was 68.9 years (SD=17.0) and 49% were women. The % of patients considered to be under-treated according to each of the PMIs was: PMI-C 25%, PMI-Cn 22%, PMI-W 42%, and PMI-Wn 38%. No difference in pain variables was found between PMI-C or PMI-Cn. Patients with adequate PMI-W had better pain relief and spent less time in severe pain than patients with an inadequate index, $p \leq 0.05$. This difference was not detected for the PMI-Wn.

Conclusions: The addition of neuropathic and local-anesthetics made little difference in either the PMI-C or the PMI-W. The results indicate that modified versions of the PMI are valid indicators of adequacy of pain treatment, but not superior to the original one.

EFIC5-0821

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

EVALUATION OF PAIN IN PATIENTS WITH DISORDERS OF CONSCIOUSNESS IN REHABILITATION SETTINGS

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Background : Detecting pain in non-communicative patients with disorders of consciousness (DOC) is a real challenge and demands trained staff and sensitive tools. Patients admitted for acute rehabilitation with DOC are not assessed routinely for presence of pain, former being reported only if it interfered with exercise treatment.

Methods: We evaluated 15 consecutive patients with DOC after severe traumatic brain injury included in early rehabilitation program using nociception coma scale revised (NOC-r) on admission and discharge and compared it to patients having pain during exercise treatment, which was reported by physiotherapists.

Results: Eleven patients were in MCS and four in VT; age range of 25-73. They started rehabilitation 5-12 days after injury and average length of stay in the hospital was 27 days. Level of pain assessed on admission in MCS ranged 2-7 and for patients in VT 1-4. Thirty per cent of patients in MCS group had NOC-r score >4 and 25 % in VT had score >3. There was no statistically significant difference between level of pain on admission and discharge ($p = 0.02$). Physiotherapists reported pain in only 6 patients and mean NOC-r score in this group wasn't significantly different from the rest of the patients ($p = 0.43$).

Conclusion: Certain number of patients with DOC in early rehabilitation settings is suffering from pain, which is not detectable by simple monitoring of pain signs presented during exercise treatment. Pain should be systematically assessed in order to detect patients with increased level of pain.

EFIC5-0927

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

PREVALENCE OF PAIN IN ELDERLY PEOPLE SUPPORTED BY HOME CARE SERVICES

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Background and aims

Elderly people in need of home care services suffer from multiple diseases, chronic conditions and pain. Because of their functional limitations they need support in their activities of daily living. There are no specific data available on prevalence of pain and it's management. The aim of this study was to evaluate systematically pain prevalence, pain intensity and the individualised pain management in this specific group.

Methods

In a prospective study, interviews were conducted by using a questionnaire with all clients of the Austrian Red Cross during a specific week. Nurses conducting the interviews were trained ahead of time. The clients or their legal representatives had to subscribe the informed consent a few days before the interview.

Results

During the survey week 965 clients were supported by home care services. Six persons had been too fragile, 91 persons refused to participate and 24 subjects had not been capable to give consent. Finally, 844 participants (mean age 80.9 ± 9.96 years, 71 % female) were included in the study

Concerning the Activities of Daily Living (ADL), 23.9% were self-sufficient, 70.3% needed support to different extent and 5.6% were completely dependent.

74% of the clients suffer from pain. According to the verbal rating scale, the mean pain level had been two. More detailed statistical analysed data will be ready for presentation at the conference.

Conclusion

Pain is highly prevalent in elderly people receiving home care services.

EFIC5-0985

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

THE TRAJECTORY OF SYMPTOMS OF CRPS OVER A YEAR

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The literature on the outcomes of CRPS over time is contradictory. Some studies report almost complete recovery and others substantially unaltered symptoms over 12 months. At least part of the inconsistency is likely attributable to inconsistent diagnostic criteria across studies and different and incomplete sets of symptoms being assessed. We carefully documented the extent of recovery from each of the signs and symptoms of CRPS in a sample of 65 newly diagnosed CRPS patients who were initially assessed within 12 weeks of symptom onset or initiating event, and then after 6 and 12 months. Recovery in symptoms tends to occur mostly in the first 6 months and then tends to plateau. While symptom improvement overall is clinically significant, 2/3 of participants still met the IASP-Orlando criteria for CRPS at 12 months and outcomes are less optimistic than shown by other prospective studies.

IS THERE ANY CORRELATION BETWEEN CHILD'S DISABILITY TYPE, PAIN AND PSYCHOLOGICAL CONDITION OF INDIVIDUALS WITH DISABLED CHILDREN?

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Background and Aims:

The existence of a disabled child is likely to negatively affect the life of families. This negative effect can lead to increasing in caregiver's pain and stress levels during their daily living.

The aim of our study was to assess the correlation between child's disability type, pain and psychological status of parents with disabled children.

Methods:

126 mothers of disabled children were included in the study. Demographic information of mother's and disabled children were assessed by special evaluation forms, effects of pain state on daily living activities were assessed by SF-36 pain subscale and stress level was also assessed by SF-36 emotional functioning subscale and Beck Depression Inventory.

Results:

The average age of mothers was $36,46 \pm 7,2$. Disability types of children were detected as 67,5% physical, 16,7% mental, 7,9% autism, 4,8% hyperactivity, 3,2% hearing and speaking problems. A meaningful positive correlation was found between results of Beck Depression Inventory and emotional role of SF-36 ($r=0,355$, $p<0.001$) and also with SF-36 pain sub score ($r=0,435$, $p<0.001$) among cases. The relationship between disability type of children and emotional role of SF-36 in cases couldn't reach the meaningful level ($p=0,06$)

Conclusion:

It was detected in this study that pain perception of mothers with disabled children was more related to mother's psychological condition than child's disability level.

We believe that beside physical and social supporting aspects, psychological support would be effective in preventing stress-related pains of caregiver parents in the rehabilitation of disabled children.

EFIC5-1008

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

DETERMINING RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, PAIN AND PSYCHOLOGICAL STATUS IN NON-SPECIFIC BACK PAIN

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PURPOSE: The aim of this study is to determine relationship between physical activity level, pain severity and psychological status in patients with non specific back pain.

METHODS: International Physical Activity Questionare (Short Form), Beck Depression Index and Visual Analogue Scale (were used for patient's assessment in this study,

RESULTS: The study included 27 people (females/males: 18/9) (age range: 21-68 years). The average height of the participant's was 167.89 ± 9.07 cm and average weight was 76.78 ± 17.57 kg. 17.9% of patients were doing regularly exercises. Patient's physical activity level was high ($5858,08 \pm 4071,21$ MET-min/week). Beck Depression Index results was found 'Mild Depressive' (mean score: 11.67 ± 6.08). Mean pain severity was found 6.22 ± 1.67 according to VAS in patients' evaluation. According to physical tests were found several musculoskeletal and postural problems (89.3% hip flexors shortness, 53,6% hamstring shortness, 57.1% trunk extensors shortness, 17.9% gastrocnemius shortness, 37% rounded shoulders, 77.8% of anterior pelvic tilt). When the results are analyzed, it was found statistically significant positive relationship between psychological status and pain ($r = 0.492$ $p = 0.09$). There was no correlation between patient's physical activity levels, pain and other parameters ($p > 0.05$).

CONCLUSION: We have identified poor psychological state affects pain. In addition, we think to investigate the effects of doing regularly exercise on low back pain with more cases in future studies.

DETERMINE OF USED PAIN RATING SCALES IN NEUROSURGERY CLINICS: A SHORT REVIEW

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DETERMINE OF USED PAIN RATING SCALES IN NEUROSURGERY CLINICS: A SHORT REVIEW

Background and aims: Pain is one of the most common symptoms in neurosurgical diseases (1,2). Measurement and evaluation of pain is very important in the relief of patients with pain (3,4). This review aim to determine the most used pain assessment tools in neurosurgery clinics.

Methods: When literature examined, there are various assessment pain assessment tool for measure pain in the neurosurgical intensive care unit and clinics; numerical rating scales (NRS), visual analogue scales (VAS) nonverbal pain scale (NVPS), McGill Pain Questionnaire (MPQ), Wheelchair User's Shoulder Pain Index (WUSPI), the Critical-Care Pain Observation Tool (CPOT), Behavioral Pain Scale (BPS), Critical-Care Pain Observation Tool (CPOT) (5-11).

Results: Scales provide information about characteristics of pain. Especially, pain routinely is monitored in intensive care units (12). Visual analogue scale (VAS) or numeric rating scale (NRS) can use to assess pain intensity. The Behavioral Pain Scale (BPS) and the Critical-Care Pain Observation Tool (CPOT) are the most valid and reliable behavioral pain scales (13).

Conclusions: Pain is individual (14). Considering the individual differences, appropriate assessment tools should be used. In neurosurgical patients, validity and reliability scales should be used.

CLINICAL ANALGESIA CORRELATES WITH DECLINE IN TEMPORAL SUMMATION IN RESPONSE TO REMIFENTANIL INFUSION IN PATIENTS WITH CHRONIC NEUROPATHIC (RADICULAR) PAIN

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Introduction: Animal studies have shown that in addition to their anti-nociceptive effects, opioids have attenuated the electrophysiological 'wind-up' phenomenon. Although effects of opioids on clinical pain and on temporal summation (TS), the human correlative of this phenomenon - have been tested repeatedly, correlations between these two parameters have not been reported so far. The present study was designed to search for possible correlations between the effects of remifentanil on clinical pain intensity and on the magnitude of TS in patients with chronic pain.

Methods: Clinical pain intensity and thermal TS were assessed in 31 patients (7 F/ 24 M, mean±SD age of 53 ± 14 years) with chronic lumbar (radicular) neuropathic pain. Assessments were performed at four time points: baseline, during intervenous administration of saline, during intervenous administration of remifentanil and 20 minutes following cessation of remifentanil infusion.

Results: Friedman test revealed statistically significant differences in the magnitudes of both clinical pain intensity and TS ($\chi^2(3) = 73$, $p < 0.001$; and $\chi^2(3) = 11.38$, $p = 0.01$, respectively) . Post hoc analysis (Wilcoxon signed-rank test) showed significant differences between clinical pain intensities measured at all time points. However significant reductions in the magnitudes of TS were found only during remifentanil compared to baseline ($p=0.014$) and to saline ($p=0.019$). The change in clinical pain between saline and remifentanil positively correlated with the change in TS measured at the same time points ($r_s=0.444$, $p=0.012$).

Conclusions: These results point to possible causative relationship between TS and opioid analgesia

EFIC5-0197

Pain treatment (conservative): Opioids

ACUTE AND REFRACTORY PAIN CONTROL IN MUSCULOSKELETAL PATHOLOGY WITH TAPENTADOL IN AN EMERGENCY DEPARTMENT OF A TERTIARY HOSPITAL

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Background and aims:

Acute-onset and refractory musculoskeletal pain are frequent motives for consultation in the Emergency Department and its immediate control is a priority. The objective of this study is to evaluate the response to tapentadol in patients complaining of acute or treatment resistant pain in several conditions.

Methods:

A unicentric, prospective observational study was performed. Pain location and other pain characteristics were assessed by a predefined questionnaire that included VAS and BPI and evaluation of quality of life by the EQ-5D at initial consultation and 15 days after first visit.

Results:

29 patients were included: 14 women and 15 men; 66% of patients suffered mixed pain, 28% neuropathic pain and 6% nociceptive pain. Primary localization of pain was lumbar (13/29 patients) and cervical (5/29). Previous treatment included NSAIDs (25/29 patients) and pregabalin (8/29 patients). 14 patients were treated with tapentadol 50mg daily and 15 patients with tapentadol 100mg daily, doses chosen according to type of pain and previous treatments.

There were positive significant variations in all the BPI dimensions: increasing the pain relief in the patients (BPI8) and EQ-5D and decreasing in all the rest with bilateral significances $< 0,005$ in all the cases for the non-parametric Wilcoxon signed-rank test.

Satisfaction was significantly higher in the group of patients treated with tapentadol 50mg daily than in the group of patients treated with 100mg daily.

Conclusions:

Tapentadol is an adequate option of treatment for musculoskeletal pain control in Emergency Department, resulting in improved the QoL of patients treated

DEVELOPMENT OF A NOMOGRAM FOR EQUIANALGESIC DOSE CALCULATION FOR OPIOID ROTATION

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Background and aims: Opioid rotation is a medical strategy that consists in substituting one opioid with another by using the same or another route of administration. Safe and effective opioid rotation requires to calculate an equianalgesic dose, the dose most likely to provide the same pain relief of the previous opioid. Equianalgesic dose calculations can be difficult to perform and to learn.

Methods: Using a table of accepted equianalgesic ratios, a nomogram were created with the objective of allowing an easy system for equianalgesic dose calculations. In this nomogram there is a series of lines, each of which represents a different opioid and route of administration. The line of each opioid and route is numbered using a different proportion in accordance with their relative potency.

Results: The complete nomogram can be seen in the Figure 1. This nomogram permits easy equianalgesic dose calculations by identifying the lines that represent the initial and target opioids and routes of administration, and then drawing a perpendicular line that crosses both lines in the place of the dose of the original opioid that is being used by the patient. The equianalgesic dose is obtained from the point where that perpendicular line crosses the line representing the target opioid.

Figure 1. Nomogram for equianalgesic dose calculation.



Conclusions: This nomogram is a proposal to simplify equianalgesic dose calculation. Using a system like this has the potential to reduce the difficulty and therefore errors when choosing doses in opioid rotations, especially when learning and teaching.

EFIC5-0294

Pain treatment (conservative): Opioids

RARE ADVERSE DRUG REACTIONS INDUCED BY OPIOID ANALGESICS

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While the use opioid analgesics in clinical practice, we meet with the occurrence of adverse drug reactions of varying clinical symptoms. In the period from January to December 2014 in our Clinic we recorded 67 cases of adverse reactions in patients treated with opioid analgesics. The severity of these adverse reactions forced to rotate opioids (n=54) and as many as 13 cases, both the clinical symptoms and severity of unwanted symptoms forced to stop drug use, and the search for alternative methods of pain treatment. The following describes adverse reactions for each of opioid analgesics.

Morphine (n=5)- rhabdomyolysis, cardiotoxicity, priapism

Oxycodone (n=3)- QT prolongation, Baboon syndrome

Fentanyl (n=42)- Headache, serotonin syndrome, tachycardia, anaphylactoid reaction, rhinitis

Buprenorphine (n=11)- abscess, bradycardia, QT prolongation, serotonin syndrome.

Methadone (n=6)- Angiooedema, renal failure, tremor, headache

Knowledge of the safety profile of opioid analgesics allows aware of their use in clinical practice.

This paper describes the analysis of the observed adverse reactions

EFIC5-0351

Pain treatment (conservative): Opioids

DIFFERENTIAL EFFECTS OF OXYCODONE/NALOXONE VS. OXYCODONE VS. MORPHINE IN LOW BACK PAIN PATIENTS PRESENTING WITH NEUROPATHIC VS. NOCICEPTIVE PAIN

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Background and aims: Despite their widespread use in general practice, the efficacy of strong-opioids in chronic low back pain (cLBP) is under question. Beside general differences among available opioid analgesics, differences in the underlying LBP-pathophysiology are frequently used as explanation. We've compared the analgesic effects of morphine (MOR), oxycodone (OXY) and oxycodone/naloxone (OXN) for patients suffering from nociceptive (NOC) vs. neuropathic (NEP) cLBP.

Methods: Post-hoc analysis of data from a prospective randomized open-label blinded endpoint study (PROBE) with 901 cLBP patients who were offered a randomized treatment with MOR, OXY or OXN (1:1:1) for 3 months. Subgroup analysis of NOC vs. NEP patients.

Results: At study end, average ($\pm$ SD) LBP improved significantly in all three treatment groups vs. baseline: MOR / OXY / OXN: $46.0 \pm 17.5 \rightarrow 24.8 \pm 19.4$ / $46.0 \pm 17.5 \rightarrow 24.1 \pm 19.8$ / $45.5 \pm 13.6 \rightarrow 17.8 \pm 16.9$ ($p < 0.001$ for each), however, between group comparisons showed superior relief rates for OXN both vs. OXY and MOR ($p < 0.001$ for each). Relative LBP relief for NOC/NEP was -47.3/-43.7% (D: -3.6) for MOR, -47.6/-41.3 for OXY (D: -6.3), -58.2/-64.5% for OXN (D: +6.3), and corresponding 50% response rates were 55.1/51.9% for MOR (D: -3.2), 58.9/54.9% for OXY (D: -4.0), and 68.4/72.3% for OXN (D: +3.9).

Conclusions: Under the conditions of this PROBE study (where therapeutic options and management strategies available in clinical practice were incorporated into the rigor of a prospective RCT), LBP treatment with OXN shows not only in general a superior analgesic efficacy in comparison with OXY as well as MOR, but also irrespective of the underlying LBP pathophysiology.

EFIC5-0352

Pain treatment (conservative): Opioids

GASTROINTESTINAL SAFETY AND TOLERABILITY OF OXYCODONE/NALOXONE VS. OXYCODONE VS. MORPHINE IN LOW BACK PAIN PATIENTS WITH AND WITHOUT CONSTIPATION

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Background and aims: Opioid-induced bowel dysfunction (OIBD) is a major complication in long-term opioid treatment. Controlled-release (CR) oxycodone/naloxone (OXN) demonstrated an improved OIBD profile vs. conventional opioid analgesics such as oxycodone (OXY) or morphine (MOR) in controlled trials, however, only limited data exist for the differential effects in patients with or without constipation prior opioid-use.

Methods: Post-hoc analysis of data from a prospective randomized open-label blinded endpoint study (PROBE) with 901 opioid-naïve chronic low back pain (cLBP) patients who were offered a randomized treatment with MOR, OXY or OXN (1:1:1) for 3 months. Subgroup analysis of patients with vs. those without constipation.

Results: Prior opioid use, 643 patients (71.4%) presented with a bowel function index (BFI) ≤ 28 and were classified as non-constipated (NCP), 258 (28.6%) showed BFI scores > 28 and were grouped as constipated patients (COP). For NCP, average ($\pm$ SD) BFI scores increased in all treatment groups from baseline to study end (MOR: $9.2 \pm 9.6 \rightarrow 45.6 \pm 32.4$; OXY: $9.4 \pm 10.1 \rightarrow 37.3 \pm 29.1$; OXN: $9.5 \pm 9.6 \rightarrow 19.2 \pm 19.9$); vice versa the proportion of patients with normal BFI scores dropped to 40.1, 46.2 and 76.2%. For COP, BFI increased as well (MOR: $47.4 \pm 89.7 \rightarrow 4.7 \pm 24.2$; OXY: $45.8 \pm 9.1 \rightarrow 74.6 \pm 22.8$; OXN: $46.0 \pm 9.5 \rightarrow 56.7 \pm 19.6$). For all treatment groups, observed changes were significant, but significantly more for NCP vs COP ($p < 0.001$) and significantly less with OXN vs. OXY or MOR ($p < 0.001$ for each).

Conclusion: Under the conditions of this PROBE study, OXN induced significantly less OIBD complications than OXY or MOR, especially – but not exclusively – in opioid-naïve patients without constipation prior opioid use.

EFIC5-0526

Pain treatment (conservative): Opioids

EFFECTIVENESS AND TOLERABILITY OF TAPENTADOL PROLONGED RELEASE COMPARED WITH PRIOR OPIOID THERAPY FOR CHRONIC KNEE ARTHRITIS.

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Background: many patients with severe knee pain receive WHO step III opioids. the objective of this study is to evaluate the effectiveness of Tapentadol prolonged release (PR) 50 mg three times a day when it substituted other opioids

Methods: 84 patients, male and female, all over 40 years old, who had taken WHO step III opioids for at least two weeks for severe knee arthritis were included in the study. Patients switched directly to oral Tapentadol PR 50mg three times daily during a 4 week titration and 4 week maintenance periods. Oral Tapentadol 50mg immediate release was allowed max twice daily for acute pain episodes. Visual Analogue Pain Scale was used to assess pain at week one (baseline) and at week 4 (primary endpoint). We counted the percentage of patients with same or less VAS at week 4 vs week 1. We also noted adverse effects and discontinuation rates.

Results: 4 patients (4.7%), discontinued the study due to adverse effects or lack of efficacy. From the remaining 80 patients 43 (53%) showed improvement of VAS at week 4 ($p < 0.01$) and 37 (47%) showed no improvement. The most common side effects were constipation (46%) and nausea (24%).

Conclusions: Tapentadol PR 150mg daily is effective for patients with severe chronic knee pain who previously received other opioids. Mean pain intensity scores were 5 at baseline (week 1) and 2.4 at week 4 (primary endpoint) and 1.8 at week 8 (end of study).

EFIC5-0538

Pain treatment (conservative): Opioids

A LARGE DUTCH PROSPECTIVE REAL-LIFE STUDY ON THE TREATMENT OF NON-MALIGNANT PAIN WITH LOW-DOSE 7-DAY BUPRENORPHINE TRANSDERMAL SYSTEM (BTDS).

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Aims

This analysis describes the efficacy of low-dose 7-day buprenorphine transdermal patch (BTDS) in Dutch daily clinical practice with regard to treatment of patients with non-malignant pain.

Methods

Outcome data were collected in a 12-weeks, prospective, multicentre, real-life study in the Netherlands. Efficacy of BTDS with regard to pain-relief was evaluated with pain score (NRS 0-10) as well as by the physician on a 7-point scale (much worse, worse, slightly worse, similar, slightly better, better and much better). Patient convenience (7-point scale) was also evaluated.

Results

2866 subjects were included in the efficacy analysis of the observational study. Mean age of subjects was 67 years (20-99) (68% female; predominant pain site low back pain (39.2%)). Average (sd) pain score (NRS) at first visit was 8.0 (1.7) (n=2861). Over time mean (sd) pain score decreased to 5.0 (2.6) at last visit (n=2847). 71.7 % of physicians indicated improved efficacy of BTDS with regard to pain relief compared to previous treatment at last visit and 81.3% of patients indicated that treatment with BTDS was easier to use compared to previous analgesic treatment. 23.6% of patients (685/2902) reported an adverse drug reaction. For 7 patients (0.2%) an SAE was reported (2 probably related, 2 definitely related and 3 not related).

Conclusions

This real-life study shows that treatment with low-dose 7-day BTDS results in improved pain-relief over time as well as an improved efficacy with regard to pain as evaluated by physicians. The majority of patients indicated that BTDS-use was easier compared to previous therapy.

EFIC5-0558

Pain treatment (conservative): Opioids

TRANSDERMAL BUPRENORPHINE VS. TRANSDERMAL FENTANYL FOR CHRONIC PAIN TREATMENT IN ELDERLY PATIENTS

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Background and aims

Transdermal Buprenorphine and transdermal Fentanyl are common used opioids for chronic pain treatment. Aim of this research is to find out which transdermal opioid is better for chronic pain treatment in elderly patients.

Methods

Included: patients more than 60 years old.

Excluded: patients who usually suffer from dizziness, nausea, vomiting, constipation.

Two groups, randomised clinical trial: Buprenorphine group of 40 patients received transdermal Buprenorphine 35 mcg/h and Fentanyl group of 40 patients received transdermal Fentanyl 25 mcg/h.

Pain measurement before transdermal application and 48 hours after application. Numeric Rating Scale 0-10

After 48 hours measurement of opioid side effects dizziness, nausea, vomiting, constipation and patients satisfaction with opioid therapy.

Statistica: t-test and level of significance $p < 0,05$

Results

In Buprenorphine group there was significant analgesia after 48 hours ($p < 0,001$). The same in Fentanyl group ($p < 0,001$).

There was no difference in pain between groups at the beginning ($p = 0,82$) and after 48 hours ($p = 0,51$).

In Fentanyl group there was significantly more dizziness, nausea and vomiting than in Buprenorphine group ($p < 0,001$).

Constipation was without difference between groups ($p = 0,86$).

Patient satisfaction was significantly greater in Buprenorphine group than in Fentanyl group ($p < 0,001$).

Conclusions

Transdermal Buprenorphine 35 mcg/h has similar analgesic effect as transdermal Fentanyl 25 mcg/h. Fentanyl produces more side effects (dizziness, nausea and vomiting) than Buprenorphine. Constipation is without difference between Buprenorphine and Fentanyl. Patients satisfaction with Buprenorphine is greater than Fentanyl, because there are less side effects.

EFIC5-0713

Pain treatment (conservative): Opioids

BLADDER FUNCTION AND QUALITY OF LIFE BENEFITS OF PROLONGED-RELEASE OXYCODONE/NALOXONE (OXNPR) IN PATIENTS WITH BLADDER PAIN SYNDROME (BPS)

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Background and aims

Symptoms of BPS include urgency and increased frequency of urination. Pain control and increased bladder capacity are key objectives of treatment. This pilot study investigated the effect of OXNPR on symptoms of BPS.

Methods

Patients were randomised to double-blind OXNPR (up to 20mg oxycodone/10mg naloxone, N=32) or placebo (N=28) BID for 8 weeks; with ibuprofen 400mg as rescue. Fifty-three patients subsequently received open-label (OL) OXNPR for 4 weeks, with oxycodone immediate release 5mg as rescue. Urinary and pain symptoms and their impact on patients were assessed using the O'Leary-Sant Interstitial Cystitis Symptom Index (ICSI) and Problem Index (ICPI), Patients' Perception of Intensity of Urgency Scale (PPIUS), SF-36, and by recording micturition volume/time.

Results

Mean ICSI and ICPI scores decreased by 5.4 and 4.5, respectively, with OXNPR and by 1.4 for both scores with placebo at Week 8; the treatment difference was statistically significant for ICSI ($p=0.019$) and ICPI ($p=0.019$). Further significant ($p<0.001$) mean decreases of 2.5 (ICSI) and 2.6 (ICPI) at Week 4 of OL phase. Despite a large placebo effect, a trend for greater QoL improvements with OXNPR than placebo was observed for several SF-36 subscales and reported health transition. Larger improvements in micturition parameters were observed for OXNPR; results were confirmed by the PPIUS assessment. Further significant improvements in QoL and micturition parameters were recorded during the OL phase.

Conclusions

The results indicate OXNPR might increase bladder capacity and reduce urgency and therefore positively influence the normalisation of bladder function.

Study sponsor: Mundipharma Research GmbH & Co. KG

EFIC5-0716

Pain treatment (conservative): Opioids

SAFETY AND ANALGESIC EFFICACY OF PROLONGED-RELEASE OXYCODONE/NALOXONE (OXNPR) IN PATIENTS SUFFERING FROM SEVERE PAIN DUE TO BLADDER PAIN SYNDROME (BPS)

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Background and aims

Therapeutic options for BPS are limited and pain control remains of key importance. This pilot study assessed efficacy and safety of OXNPR in patients with BPS, to support evidence for use of opioids in this indication.

Methods

Patients were randomised to double-blind OXNPR (up to 20mg oxycodone/10mg naloxone, N=32) or placebo (N=28) BID for 8 weeks; with ibuprofen 400mg as rescue. Fifty-three patients subsequently received open-label (OL) OXNPR for 4 weeks, with oxycodone 5mg as rescue. Average pain over the last 24h was measured on the Pain Intensity Scale (NRS 0-10), pain severity/interference were measured using the modified Brief Pain Inventory (BPI-SF), and rescue medication intake was recorded.

Results

There was a trend for greater improvement with OXNPR in all pain scores. Mean NRS scores decreased from 7.3 to 5.0 for OXNPR, and from 7.5 to 5.5 for placebo at Week 8, with a further decrease from 5.4 to 3.8 during the OL phase. BPI-SF pain severity decreased by 8.6 (OXNPR) and 5.8 (placebo) at Week 8 and by 4.9 in the OL phase, while pain interference decreased by 16.3 (OXNPR) and 10.9 (placebo) at Week 8 and by 10.8 in the OL phase. Mean rescue ibuprofen use was >50% higher for placebo (3072.7mg) than OXNPR (1981.8mg) at Week 8. The incidence of adverse events was lower with OXNPR.

Conclusions

Pain is one of many symptoms in this multifaceted disease; however, our results suggest OXNPR might reduce pain in patients with BPS.

Study sponsor: Mundipharma Research GmbH & Co. KG

PROLONGED-RELEASE OXYCODONE/NALOXONE (OXN PR) FOR SEVERE PARKINSON'S DISEASE (PD)-RELATED PAIN: OUTCOMES FROM A DOUBLE-BLIND, RANDOMISED, PLACEBO-CONTROLLED STUDY

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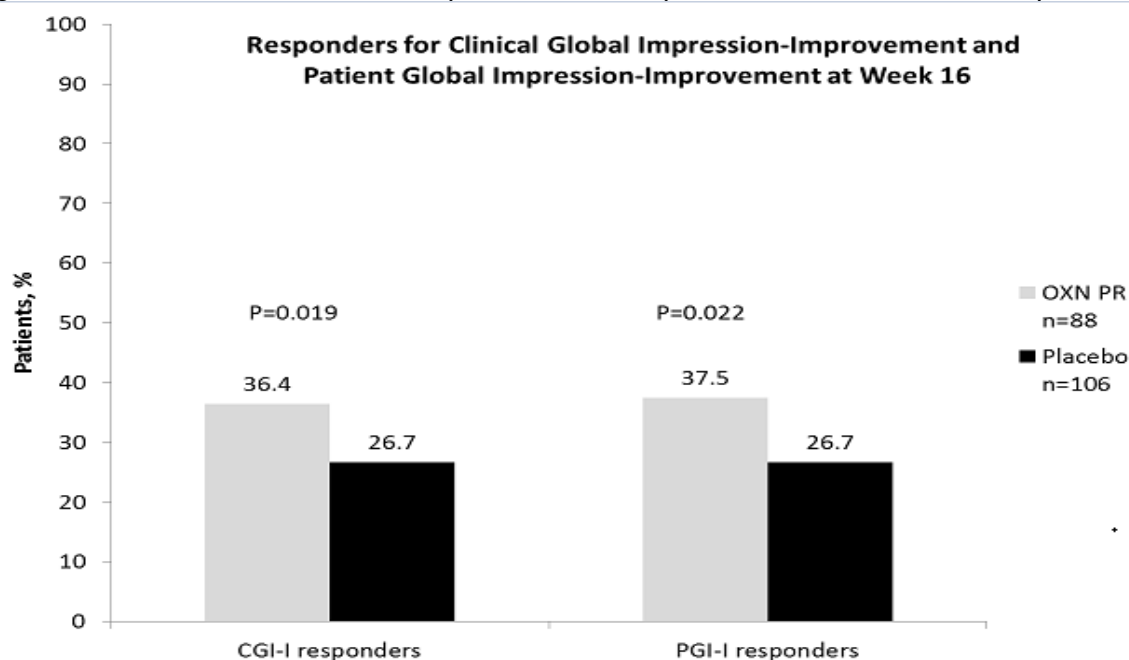
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Background and aims: OXN PR provides equivalent analgesic efficacy and improved bowel function versus oxycodone PR for many types of moderate-to-severe chronic pain. A randomised, double-blind study investigated OXN PR vs placebo for severe PD-related pain.

Methods: Patients with PD (Hoehn & Yahr Stage II–IV), severe pain in ≥ 1 section of King's PD Pain Scale and average 24-h pain score ≥ 6 (11-point scale: 0 'no pain' to 10 'worst pain imaginable') were randomised to OXN PR (N=93; titrated to $\leq 20/10$ mg bid) or placebo (N=109) for 16 weeks. Primary endpoint was average 24-h pain score (Week 16, Full Analysis Population [FAP]). Secondary endpoints included assessment of illness improvement/worsening vs baseline using Clinical Global Impression-Improvement (CGI-I) and Patient Global impression-Improvement (PGI-I) scales, and safety.

Results Mean 24-h pain was numerically improved with OXN PR vs placebo at Week 16 in the FAP (least squares mean difference [95% CI] -0.6 [-1.26, 0.02] points, $p=0.058$) and significantly improved in the per protocol population (PPP; -0.9 [-1.52, -0.21], $p=0.010$). Responder ('Much improved' or 'Very much improved') rates were significantly higher with OXN PR vs placebo: odds ratio (95% CI) for CGI-I: 1.6 (1.08, 2.37), $p=0.019$ and PGI-I: 1.6 (1.07, 2.49), $p=0.022$; Figure. Incidence of adverse events (65.2% vs 69.7%) was similar for OXN PR vs placebo.



Response was assessed on a 7-point scale ('very much improved', 'much improved', 'minimally improved', 'no change', 'minimally worse', 'much worse', 'very much worse')

Responders: 'Much improved' or 'Very much improved'

Conclusion: While the primary endpoint of this study was not met statistically at Week 16 in the FAP, analysis in the PPP and secondary endpoint data support the utility of OXN PR for severe PD-related pain.

Sponsor:Mundipharma Research

EFIC5-0769

Pain treatment (conservative): Opioids

**CONSUMPTION OF STRONG OPIOIDS IS EQUAL TO THE PAIN CONTROL QUALITY.
TRUE OR FALSE?**

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Aim of Investigation:

The ATOME conference was held in Bratislava in November 2014. The main reason for the conference was the increase of prescription of the strong opioids. Slovakia's consumption was only 121 morphine equivalents per capita (58%), while 210mg would have been adequate for treatment of all pain conditions.

Methods:

Deputy of Ministry of Health explained that our law of prescription of strong opioids is the same as the recommendation of WHO. I myself explained, that we have no restrictions: morphine can be prescribed by every doctor. Oxycodone, tapentadol, fentanyl and buprenorphine can be prescribed by algesiologist, oncologist, neurologist and orthopedist, all are involved in chronic pain treatment. This is all what we and our patients need.

Results:

We can summarise that chronic pain control in Slovakia is on very high level. In Slovakia we have 44 pain clinics, which are managed by qualified algesiologists, who can prescribe all strong opioids available in the world in this time. They are conscious of their side effects immune and hormonal system or other and do the best for their patients to control pain and preserve them.

Conclusion:

We don't think, that the consumption of strong opioids is equal to the pain control quality. On the contrary, the best chronic pain control means the right diagnosis of pain and to set the best possible comprehensive treatment, strong opioids are only one part of it. The most important thing is, to have network of pain clinics with well educated algesiologists.

PERSISTENT CHRONIC PAIN AFTER NEUROBRUCELLOSIS

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Background and aims

Brucellosis is a systemic zoonosis which can involve any organ. Neurobrucellosis is an infectious disease occurring in 2-7% of animal labourers (sheep, animal carcasses). We present a clinical case of complex chronic pain (mainly nociceptive) refractory to several drugs as a complication of neurobrucellosis.

Methods

A 60 year old male, animal labourer, with recurrent emergency visits that resulted in severe neurologic involvement 2 years ago, suspected brucellosis. He had no analytic or serologic evidence of relapse, was referred to pain unit with severe joint (low back and sacroiliitis) pain and polyneuropathy, impairing his ability to stand up and walk, with functional loss and a depressive mood. He was treated with non-steroidal anti-inflammatory drugs, opioids, muscle relaxants, anticonvulsants and antidepressants, with no pain relief (VAS and LANSS scale) and low quality of life (SF36 scale)

Results

Pain was treated with high doses of acetaminophen retard (AR) (120mg/day) and tapentadol (100 mg id). After a brief improvement of inflammation, pain and quality of life, AR was decreased and tapentadol was increased to 200mg bid with cognitive-behavioural therapy. He remains medicated with tapentadol (with higher doses in the winter) and only occasionally with AR.

Conclusions

The patient's work history is critical for a correct diagnosis; osteoarticular chronic pain is not common in cured patients. Brucellosis relapse has to be excluded and long term opioids may be necessary. A 2 year follow up of cured brucellosis patients, with pain control, provides excellent quality of life.

EFIC5-0829

Pain treatment (conservative): Opioids

A STUDY OF PATIENTS TREATED WITH TAPENTADOL DURING YEAR 2014

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Background and aims

Tapentadol, an opioid used in naïve patients or in rotation, was introduced in our hospital in July 2012 in collaboration with the Pharmacy Department. Our first experience was presented in EFIC 2013 in a preliminary study. In the present study, we want check if with a larger number of patients the results are identical or differ significantly.

Methods

Patients were selected in the database from Pain Unit of Ponta Delgada's Public Hospital to select all patients treated with Tapentadol during 2014, and medical records revised to document demographic data, pathology, previous medications, pain intensity (numerical rating scale), tolerability.

Results

From 286 patients 73.4% were female, 30% from 46-55 years and 30% above 65 years. The most prevalent pathology was low back pain (41%); fibromyalgia (11%); two painful diseases (28%); 37% were opioid naïve; 63% made rotation; 15% were treated for 12-18 and 35% more than 18 months.

Tapentadol was discontinued in 24 % (19% by side effects, 6% not efficient up to 450 mg).

The media pain intensity was 4.1 and final was 1.7.

Of the 24% of patients who stopped Tapentadol, 19% were for side effects. The most common side effect was nausea (13%); 65% had none.

Conclusions

In our population, whose majority had more than 46 years and multiple pathologies (neuropathic, osteoarticular, fibromyalgia), Tapentadol was very effective even in long term treatment, with few side effects. Age or sex didn't influenced efficacy or suspension. These results confirm those we find in our preliminary study.

EFIC5-0841

Pain treatment (conservative): Opioids

**OXYCODONE IN THE TREATMENT OF CHRONIC MUSCULOSKELETAL PAIN-
PRELIMINARY SINGLE-CENTRE EXPERIENCE**

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Background. Use of strong opioids in non-cancer pain is still controversial. The aim of this study was to evaluate efficacy and tolerability of controlled-release oxycodone (oxycodone CR) as a first-line therapy in patients with chronic non-cancer musculoskeletal pain that was not relieved by other analgesics in a “real-life” practice.

Methods. This was a prospective, open-label, single-centre, observational study. Patients with different chronic musculoskeletal conditions (osteoarthritis, low-back pain, spondyloarthritis) who in spite of treatment with NSAIDs, weak opioids and paracetamol suffered from moderate-to-severe pain were switched to oxycodone CR and treated for 14 days. The initial dose was 10 mg bid, and it could be elevated. The primary efficacy outcome was pain intensity and the secondary outcome was general health assessment (both rated on horizontal 0-10 VAS).

Results. Fifteen patients (12 women, 3 men) of the age of 61 ± 12 years were enrolled in the study. After commencing the treatment with oxycodone CR patients experienced continuous decrease in level of pain. Overall six patients discontinued the treatment, mainly due to side effects. Average pain intensity dropped from 7.87 ± 2.28 to 5.92 ± 2.43 . Accordingly, 67% patients at the beginning of the study suffered from severe pain, while only 11% at the end of the study. General health was rated 7.27 ± 2.14 and 6.00 ± 1.53 , respectively.

Conclusions. Our results show that in patients with chronic non-cancer pain refractory to simple analgesics, NSAIDs and weak opioids treatment with oxycodone CR was associated with a significant reduction of level of pain and improvement in general health assessment.

EFIC5-0855

Pain treatment (conservative): Opioids

EFFICACY OF THE PERIPHERALLY ACTING MU-OPIOID RECEPTOR ANTAGONIST NALOXEGOL IN PATIENTS WITH NONCANCER PAIN AND OPIOID-INDUCED CONSTIPATION OVER 4 WEEKS

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Background and aims: The efficacy and safety of naloxegol over 12 weeks in 2 pivotal studies in outpatients with noncancer pain and confirmed opioid-induced constipation (OIC) was previously reported (Chey et al., *N Engl J Med.* 2014;370:2387-96). We now report efficacy results during the first 4 weeks of treatment.

Methods: Patients receiving opioids (30–1000 morphine equivalents/day) were randomized 1:1:1 to daily oral treatment with naloxegol (12.5, 25 mg) or placebo in two phase 3 randomized, double-blind, 12-week studies (KODIAC-04, n=641 [NCT01309841]; KODIAC-05, n=696 [NCT01323790]). The 4-week response rate (≥ 3 spontaneous bowel movements (SBMs)/week with ≥ 1 SBM/week increase over baseline in 3 of the past 4 weeks) was assessed in the intent-to-treat (ITT) and laxative-inadequate responder (LIR) subpopulation, for each study individually, and pooled.

Results: See table.

Conclusions: Naloxegol resulted in higher response rates at 4 weeks compared with placebo. These results are consistent with results at 12 weeks.

Table. Naloxegol Response Rates for Weeks 1–4 .

Population	Treatment	KODIAC-04		KODIAC-05		Pooled	
		n	Response, n (%)	n	Response, n (%)	n	Response, n (%)
ITT	Placebo	214	76 (35.5)	232	89 (38.4)	446	165 (37.0)
	12.5 mg	213	112 (52.6)*	232	114 (49.1) [†]	445	226 (50.8)*
	25 mg	214	127 (59.3)*	232	113 (48.7) [†]	446	240 (53.8)*
LIR	Placebo	118	40 (33.9)	121	47 (38.8)	239	87 (36.4)
	12.5 mg	115	64 (55.7) [‡]	125	67 (53.6) [†]	240	131 (54.6)*
	25 mg	117	72 (61.5)*	124	65 (52.4) [†]	241	137 (56.8)*

Nominal and unadjusted *P*-values vs placebo: **P*<0.001; [†]*P*≤0.05; [‡]*P*≤0.01.

CENTRAL PAIN PROCESSING IN RESPONSE TO MORPHINE/NALOXONE ADMINISTRATION IN PATIENTS WITH RHEUMATOID ARTHRITIS, PATIENTS WITH CHRONIC FATIGUE SYNDROME AND HEALTHY CONTROLS

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Background and Aims

Impaired pain inhibitory and enhanced pain facilitatory mechanisms are repeatedly reported in patients with central sensitization pain. However, the exact effects of frequently prescribed opioids on central pain processing are still unknown.

This study examined the effects of morphine and naloxone on pain thresholds (PT), temporal summation (TS) and conditioned pain modulation (CPM), in patients with chronic fatigue syndrome and comorbid fibromyalgia (CFS/FM), patients with rheumatoid arthritis (RA), and sedentary, healthy controls.

Methods

A randomized, double-blind, placebo-controlled cross-over trial was set. Nine CFS/FM patients, 11 RA patients and 20 controls were randomly allocated to the experimental (10 mg morphine and 0.2 mg Naloxone) or placebo (2 ml Aqua) group. PTs and TS at the Trapezius and Quadriceps were assessed by algometry. CPM efficacy was assessed by adding ischemic occlusion at the opposite upper arm.

Results

Morphine had a positive effect on PTs at the Trapezius ($p=0.048$) and Quadriceps ($p=0.046$) in the complete patient sample. This group also showed a positive placebo effect on PT of the Trapezius ($p=0.010$). However, no significant effects on TS and CPM could be objectified. In addition, both patient groups presented similar responses to the interventions. No effects of naloxone nor nocebo-effects were presented in the control group.

Conclusions

This study revealed anti-hyperalgesia effects of morphine in chronic pain patients. However, morphine nor naloxone did influence TS or CPM. Therefore, these results suggest that the opioid system is not dominant in (enhanced) bottom-up sensitization (TS) or (impaired) endogenous pain inhibition (CPM).

POTENTIAL DRUG-DRUG INTERACTIONS INVOLVING OPIOIDS IN PALLIATIVE CARE PATIENTS

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Background and aims: The safety of opioid treatment is a priority in the management of chronic pain. The literature search demonstrates that patients treated with opioids are at risk of serious drug-drug interactions (DDIs). The aim of the study was to analyze drugs taken by palliative care (PC) patients concomitantly with opioids and identify the medications with a potential of causing clinically relevant DDIs involving opioids.

Methods: Drugs taken by PC patients treated with opioids were analyzed. Based on the literature search all drugs that may cause pharmacodynamic (PD) and pharmacokinetic (PK) DDIs associated with opioids were determined.

Results: 150 adult PC patients with cancer using opioids were included. The patients took overall 2-17 medications (mean 8). 20% and 80% of them were treated with step II and step III WHO pain ladder opioids, respectively. 20% of the group were treated with more than one opioid. Over 40% of patients used medications that increase the risk of sedation and respiratory depression through PD mechanisms of DDIs. 54% of patients took drugs with dopaminergic, cholinergic, and serotonergic activity that increase the risk of neuropsychiatric complications of opioid treatment, including delirium and serotonin toxicity. The exposure to PK DDIs was less common. 11% of patients took moderate inhibitors of CYP3A4 and only two patients used a potent CYP3A4 inducer. Some other DDIs of minor clinical importance were also determined.

Conclusions: Most PC patients treated with opioids are exposed to potential DDIs through PD and PK mechanisms. Patients treated with opioids need to be monitored carefully for potential DDIs.

EFIC5-0966

Pain treatment (conservative): Opioids

TAPENTADOL - THE FIRST FEW CASES

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Background and Aims

Tapentadol SR is a new drug marketed for the management of mixed neuropathic and nociceptive pain. It is a mu receptor agonist and noradrenaline reuptake inhibitor with similar efficacy as Oxycodone MR and better side effect profile. Beyond the initial sponsored trials there is little evidence on its performance outside research.

Methods

Patients commenced on Tapentadol were followed up at regular intervals until established on a dose. A series of questionnaires assessing the quality of life, anxiety, depression, coping strategies were administered at the onset of therapy and at each clinic review. Notes were made on the sleep pattern, clinical impression of change and side effects as well as compliance.

Results

All patients commenced on Tapentadol had severe pain (VAS >7) and a clear diagnosis. They also had multiple medication trials of pain modulators and several opioid drugs and some had evidence of high/abnormal opioid drug use. Approximately one third of patients discontinued the drug due to side effects and / or lack of benefit. Tapentadol was only continued if it offered more than 50% relief and there were no side effects requiring treatment.

Conclusion

Tapentadol is a useful addition in a subgroup of non-responders to other medications. Due to its recent introduction in our practice Tapentadol was discontinued prematurely when side effects were suspected.

Psychometric testing improved with the use of Tapentadol and there was no evidence of abnormal drug use suggesting an additional effect on mood and behaviour.

ADRB2, PAIN AND OPIOID RESPONSE

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Background and aims

Genetic factors play a major role in chronic pain states. Adrenergic beta-2 receptors (ADRB2) and other key proteins of adrenergic system modulate pain. Genes encoding for these proteins are prone to genetic variation that can alter levels or duration of action of catecholamines and impact the amount, availability or function of their receptors. Such changes can cause imbalance of adrenergic system and lead to increased sensitivity to pain, higher incidence of chronic pain conditions and altered opioid responses. Here, we aim to characterize the effects of ADRB2 on pain and opioid responses in humans and rodents.

Methods

In humans, pain was assessed in the prospective cohort of 1000 breast cancer surgery patients. Prior to surgery experimental heat and cold) pain were assessed. Postoperative pain and opioid responses were followed during 24h after the surgery. 40 single nucleotide polymorphisms (SNPs) in *ADRB2* were genotyped and their association with outcome variables was assessed using linear regression. In animals, the effect of propranolol pre-treatment on morphine analgesia and tolerance were assessed after 12 days of administration in Wistar Han rats.

Results

In humans, several *ADRB2* SNPs were associated with experimental and postoperative pain and opioid responses. In rodents, morphine tolerance was partially reversed and analgetic effect of morphine restored by co-administration of propranolol.

Conclusions

Our results suggest that ADRB2 and genetic variation in *ADRB2*-gene are involved in modulation of pain and opioid responses and morphine tolerance can be reversed and analgetic effect of morphine restored by co-administration of propranolol.

EFIC5-0355

Epidemiology, assessment, organisation of pain treatment: Documentation

THE GERMAN PAIN REGISTRY – IMPLEMENTATION OF PAIN-RELATED HEALTH SERVICES RESEARCH IN DAILY LIFE.

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Background and aims: Health services research (HSR) is – in contrast to classical medical research – concerned with delivery and access to care and based on research approaches that can be applied either by people who make decisions or deliver care in the health care system as well as by patients themselves – each under daily life conditions of routine care. For pain patients, the German Pain Society (GPS) developed an online documentation service/tool, which addresses both, current documentation standards for individual patient care in treatment centres, as well as real-time access to pseudonymised data for research institutes.

Methods: Backbone of the German Pain Registry is the web-based and platform independent online app iDocLive®, that offers GPS-members as well as patients – via safeguarded connections to electronic data processing centres, advanced encryption technologies and authorized end-user equipment – a 24/7 data access free of charge. Documentation standards within iDocLive® are those defined by the GPS, which are a) freely adoptable to individual patient and/or centre needs and b) completed by patients, medical staff as well as involved physicians and/or co-therapists either directly within their pain centres or from any secured web-access throughout the world.

Results: Since its implementation on January 2nd 2015, 30 centres participated and entered data for ~60 patients (~200 questionnaires) per day, resulting in the fastest growing pain registry world-wide.

Conclusions: Based on the online app iDocLive®, the GPS successfully developed and implemented the German Pain Registry as a framework for independent HSR in pain medicine.

EFIC5-0865

Epidemiology, assessment, organisation of pain treatment: Documentation

WILL PAIN APPS FILL A VOID OR CREATE A NEED IN THE CLINICAL WORKFLOW?

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Aim and Background: Smartphone and tablet applications or APPs is an emerging technology platform that may facilitate the documentation and tracking of pain and related symptoms. Given that pain is a common clinical symptom the documentation and communication of pain for APP development will require two types of user-driven design considerations. The first is user-driven design from the patient and second is the clinical perspective or needs. Enhancing patients' ability to communicate their perceived pain and related symptoms will be a critical endpoint for successful pain APP developments, such that healthcare professionals receive insight that leads to either faster diagnoses and/or better management strategies. The aim of this preliminary investigation was to identify essential design-features from the clinical perspective and gaps between patient and clinician communication. **Methods:** Semi-structured interviews were performed with healthcare professionals regularly working with patients that have pain as a major complaint. **Results:** Preliminary analysis of 25 interviews revealed that language was often a barrier and pain charts were fragmented across institutions. Most were satisfied with paper-based pain tools, such as the visual analogue scale, McGill Pain Questionnaire and the McKenzie system, but would prefer a digital version to save time. Pain Apps were perceived as devices which demand additional time and may place too much focus on the pain; especially for chronic pain cases. **Conclusions:** Pain APPs would be beneficial if they can reduce rather than increase tasks within the clinical workflow; however this leaves little room for the introduction of innovative methods for patient care.

EFIC5-0179

Pain treatment (conservative): Novel therapeutic agents

EFFICACY AND SAFETY OF 7 DAYS TREATMENT WITH GRT6010, A NOVEL ANALGESIC, IN SUBJECTS WITH PERIPHERAL NEUROPATHIC PAIN SYNDROMES

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Background and aims: Neuropathic pain remains a global health burden, as current drug treatments have limited efficacy and tolerability. We tested efficacy and safety of GRT6010, a novel analgesic compound, compared with pregabalin and placebo in subjects with peripheral neuropathic pain syndromes.

Methods: This Phase IIa trial was approved by independent ethics committees. 57 subjects were hospitalized, randomized and in a double-blind manner treated for 7 days with GRT6010, pregabalin, or placebo. Primary efficacy outcome measures were treatment-induced differences in ongoing pain on a 0-10 numeric rating scale (NRS) and in brush-induced allodynia intensity on a 0-100 NRS. A Bayesian exponential decay model was fitted to the data.

Results: For both primary efficacy assessments compared to baseline, subjects on placebo improved markedly, by 2.55 (standard deviation, SD 2.15) points for ongoing pain, and by 11.17 (SD 15.88) points for brush-induced allodynia. For both assessments, mean change for GRT6010 and pregabalin was similar to placebo. Treatment with GRT6010 and pregabalin but not placebo decreased the areas of dynamic and static allodynia compared to baseline (a secondary outcome assessment). GRT6010 was safe and well tolerated.

Conclusions: GRT6010 did not differentiate from placebo or pregabalin in primary efficacy or safety evaluations but suggested pharmacology in secondary endpoints. This hospital-based short trial had an unexpectedly high placebo response. Pregabalin did not differentiate from placebo, indicating a lack of assay sensitivity in this setting and an inconclusive trial.

(ClinicalTrials.gov identifier: NCT01485094).

EFIC5-0245

Pain treatment (conservative): Novel therapeutic agents

RECYCLING ANESTHETIC XENON FOR MULTIPLE PATIENT USE

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Background: Xenon, being a potent inhalation anesthetic with many salubrious qualities, except that expense has mitigated the development of its use for anesthesia. Many researchers have suggested a niche for xenon as anesthetic based on its pharmacokinetic, cardiac stability, neuroprotective and analgesic properties. Being scarce and expensive, a closed rebreathing system offers the optimum delivery method. Reducing waste through on-line recycling after regeneration will help xenon to find its place among anesthetic substances.

Methods: To eliminate waste, we have designed a system that will recover Xenon from exhaled gas. The Xenon is recovered using Silver Nanoparticle (Ag-ETS-10) adsorption bed to provide interaction between xenon and silver at low pressure. During Adsorption, the high selectivity of silver exchange zeolite for Oxygen and Xenon is observed. This Selectivity allows on-line recycling of xenon in an anesthetic closed loop system. Regeneration of xenon occurs offline by thermal heating the adsorption unit, then separating and purifying xenon for future uses.

Results: Anesthetic xenon can be recovered and reused from patient to patient to make it economically competitive with current gold standard methods for inhaled anesthetics.

Conclusion: This low-cost xenon anesthetic gas will be attractive for two broad applications: (1) Xenon will be the anesthetic agent of choice for large fraction of millions of surgical procedures that are performed each year in the United States on patients with cardiovascular conditions (2) because of fewer complications with rapid induction and emergence, xenon anesthesia can reduce patient time in hospitals, with large benefits to healthcare costs.

EFIC5-0332

Pain treatment (conservative): Novel therapeutic agents

TROPOMYOSIN RECEPTOR KINASE (TRK) A RECEPTOR INHIBITION REDUCES PAIN BEHAVIOUR IN A RODENT MODEL OF OSTEOARTHRITIS (OA)

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Background and aims

We investigated the effect of a selective TrkA inhibitor in the medial meniscal transection (MNX) model of OA pain. We also investigated duration of drug effect following treatment withdrawal.

Methods

Male rats (n=10/group, 200-300g) underwent MNX or sham surgery. Pain behaviour was assessed as weight-bearing asymmetry (%) and hind paw withdrawal threshold (g). Oral doses (30mg/kg) of AR786 or vehicle were administered twice daily in a preventative protocol. Duration of effects was evaluated for 2 weeks after treatment discontinuation. Alterations in knee structure and inflammation were examined. Differences between groups were analysed using a Kruskal Wallis test with post hoc Dunn's test and presented as mean (95%CI) or median (IQR).

Results

MNX operated rats developed symptomatic knee OA as indicated by increased weight-bearing asymmetry (%) (MNX [21 (14-29)] v sham [2.6 (0.55-4.7), p<0.01]), reduced paw withdrawal thresholds (g) (MNX [6.7 (4-9.4)] v sham [14 (12-16), p<0.01]), synovitis (MNX [2 (2-3)] v sham [0 (0-1), p<0.01]) and joint pathology (MNX [7.1 (6.2-8)] v sham [1.3 (0.54-2.1), p<0.01]). Pain behaviour was inhibited in rats that received AR786 (weight-bearing asymmetry [4.1 (-0.31-8.4)%, p<0.01] and paw withdrawal threshold [13 (10-15)g, p<0.05]), but synovitis and joint pathology were not altered. Following discontinuation of AR786, analgesia was sustained for up to 10 days.

Conclusion

Blockade of TrkA signaling inhibited pain behaviour in the MNX model of OA. Analgesic effects of AR786 were independent of effects on synovitis and joint pathology. Selective inhibitors of TrkA therefore hold potential for OA chronic pain relief.

EFIC5-0589

Pain treatment (conservative): Novel therapeutic agents

POPULATION PHARMACOKINETIC/PHARMACODYNAMIC MODELING OF ONGOING PAIN SCORES WITH GRT6010, A NOVEL ANALGESIC IN PATIENTS WITH PERIPHERAL NEUROPATHIC PAIN

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Background and aims: GRT6010 is a novel analgesic compound with expected efficacy in peripheral neuropathic pain. The aim of this modeling was to identify a potential relationship between GRT6010 exposure and pain relief. Pregabalin and placebo responses were also evaluated.

Methods: Pharmacokinetic (PK) and Pharmacodynamic (PD) data were available from a Phase IIa study (n=57). In this parallel design trial, patients were randomly allocated to GRT6010, placebo or Pregabalin, taken orally for 7 days. Ongoing pain score (measured 3 times a day on 0-10 Numerical Rating Scale) was the primary endpoint and modeled using a logistic regression in NONMEM7.2.

Results: Plasma concentrations were predicted at PD assessment times by a developed population PK model for GRT6010, whereas a published model (Shoji, BJCP 2011) was used for pregabalin. The final PK/PD model described the pain scores as a function of the baseline pain score, placebo/time and drug effects. The placebo/time effect specific to each treatment was characterized by an exponential decay function. A significant drug effect was identified for both GRT6010 and pregabalin, characterized by a linear relationship with the concentrations. Moreover a higher placebo/time effect was associated with a higher baseline pain score.

Conclusions: The final population PK/PD model identified a relationship between plasma concentrations and pain scores for both active compounds. Despite the limitation of one dosing scheme per active treatment and the short duration of the treatment period, the model enabled simulations of different dosing scenarios.

SENSITIVITY OF ALLODYNIA AREA COMPARED TO INTENSITY IN DETECTING EFFECTS OF A NOVEL ANALGESIC, GRT6010, IN PERIPHERAL NEUROPATHIC PAIN PATIENTS

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Background and aims: Quantitative sensory testing (QST) assessments can be valuable tools in analgesic research studies. We looked at the relative sensitivity of a range of tests in detecting effects of GRT6010, a novel analgesic compound, compared with pregabalin and placebo in 57 subjects with peripheral neuropathic pain.

Methods: As exploratory endpoints, areas of static and dynamic allodynia were measured using a 128mN pinprick and standardized brush respectively. Mechanical pain sensitivity (MPS) and dynamic mechanical allodynia (DMA) intensity were assessed using standard QST procedures. Subjects met minimum entry criteria relating to presence of DMA/MPS at screening and baseline.

Results: Treatment with GRT6010 and pregabalin, but not placebo, decreased areas of static and dynamic allodynia compared to baseline. [Mean (standard deviation, SD) change: Dynamic = 11.36 (153.96) cm² for placebo, -73.98 (149.54) cm² for GRT6010 and -31.69 (75.96) cm² for pregabalin; Static = -58.01 (415.29) cm² for placebo, -133.29 (228.58) cm² for GRT6010 and -95.16 (108.04) cm² for pregabalin]. MPS and DMA were improved compared to baseline with both GRT6010 and pregabalin but these effects could not be separated from placebo. For all endpoints both pre- and post-dose values were highly consistent between consecutive days.

Conclusions: Area mapping appears to be more sensitive than MPS/DMA in detecting effects of this compound. This may be due to the clearer signal and less subjective nature of this endpoint. The consistency between the two sets of pre and post-dose values suggests good test-retest validity for all endpoints.

EFIC5-0783

Pain treatment (conservative): Novel therapeutic agents

CLINICAL CASE: PAIN MANAGEMENT OF POST-NEURALGIA FROM SHINGLES IN A GERIATRIC MALE PATIENT WITH CHRONIC ARTHROSIS

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Background and aims

Pain management in elderly patients is challenging because it needs to account for acute and chronic sources of pain. At clinical presentation, a 71-years old male patient complained of burning moderate pain in the left anterior side between T5 and T7. Two days later, a cutaneous rash with vesicular lesions appeared in the same area.

Methods

Patient was physically examined showing very good overall health status. Blood chemistry was within normal ranges. Based on clinical features, herpes zoster was diagnosed and a pharmacological intervention was recommended.

Results

Acyclovir (800 mg), four times a day was started to manage pain (Pain scale: 8/10) on May 2014. Since the pain was not greatly diminished (8/10) by August 2014, cutaneous local lidocaine (5%) plus gabapentin (300 mg) replaced acyclovir (800 mg). By September 2014, pain and discomfort was greatly reduced (4/10). Gabapentin (300 mg) was replaced by pregabalin (75 mg). On November 2014, the patient was examined and reported successful pain management (2/10) without any complications by February 2015.

Conclusions

Post-neuralgia from shingles presents a very specific set of clinical and epidemiological characteristics that need to be accounted when attending geriatric patients.

Pregabalin is a good alternative to treat post-neuralgia from shingles in patients unresponsive to NSAIDs and opioids in geriatric patients.

EFIC5-0798

Pain treatment (conservative): Novel therapeutic agents

TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) IN POST-TRAUMATIC STRESS DISORDER (PTSD) AND LOW BACK PAIN (LBP) CONSEQUENTLY TO AUTOMOBILE ACCIDENT

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INTRODUCTION

Post-traumatic stress disorder is recognized in victims of automobile accidents. Low back pain (LBP) is a medical and socio-economic problem.

OBJECTIVE

The aim of this prospective, randomized, single-blind, placebo controlled study was resolve or improve post-traumatic stress disorder and low back pain in seventy-one patients who were victims of automobile accidents.

PATIENTS AND METHODS

Seventy-one outpatients - 31 women and 40 men - age 24-36, one month without any kind of treatments.

The patients randomly (simple randomization) assigned to receive either active (A) tDCS (34 patients - 14 women and 20 men) and sham(S) tDCS (37 patients - 17 women and 20 men), eight week treatment of 2mA anodal left cathodal right dorsolateral prefrontal cortex (DLPFC) - bifrontal stimulation - tDCS 30 minutes sessions once daily from Monday to Friday until the study end point. From sham conditions, the same method was applied as the active treatment, but the device was turned off.

Pain intensity was evaluated by numeric rating scale and the PTSD symptom scale interview Hamilton Anxiety Scale (HAMS), Depression Rating Scale 17-item version Clinical Global Impressions (CGI-S and CGI-I)minimental state examination at baseline (T0), after 2nd (T1), 4th (T2), 6th(T3), 8th (T4) weeks of treatment.

RESULTS

An interim analysis showed a consistent lack of anxiolytic and analgesic effect and the study was terminated.

CONCLUSION

Bifrontal stimulation (left and right DLPFC) is not effective in relieving low back pain associate to post-traumatic stress disorder.

EFIC5-0799

Pain treatment (conservative): Novel therapeutic agents

ELECTROCONVULSIVE THERAPY (ECT) VERSUS REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (RTMS) IN PATIENTS WITH FIBROMYALGIA SYNDROME (FMS) TREATMENT RESISTANT

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INTRODUCTION

Fibromyalgia syndrome (FMS) is a clinical syndrome with recognized objective abnormalities in the neurosensory, neuroendocrine, and autonomic nervous systems. Although a great deal of research and confirmatory studies are still necessary regarding an optimal treatment.

OBJECTIVE

The aim of this study was to investigate and compare the efficacy for the treatment of pain of these two neuro-modulatory therapies.

PATIENTS AND METHODS

Fifty-three patients - 42 women and 11 men - age 36 to 48, drug-free - one month without any kind of treatments - treatment resistant- FMS associated with prevalent depression - 29 patients (22 women and 7 men) and prevalent anxiety - 24 patients (20 women and 4 men).

They randomly assigned to receive either ECT (26 patients) or rTMS (27 patients).

ECT was performed during 4 weeks - three times a week, bifrontal electrode placement. rTMS was given at high frequencies 15 Hz and delivered to left dorsolateral prefrontal cortex, sessions were performed five times a week for 4 weeks.

Outcome were assessed at baseline, 2nd and 4th weeks of treatment: HDRS-17 (depression); HAMAS (anxiety); CGI (severity and improvement), MMSE (neuropsychological effects).

RESULTS

ECT: 15 patients FMS and depression - remission - 57,7%

6 patients FMS and anxiety - moderately remission - 23,1%

5 patients FMS and anxiety - no remission 19,2%

rTMS: 27 patients: consistent lack of antidepressant, anxiolytic and analgesic effect 100%

CONCLUSION

The comparative evaluation of the rating scales shows: ECT is the most effective method for treatment.

EFIC5-0832

Pain treatment (conservative): Novel therapeutic agents

SUICIDAL IDEATION, SUICIDE PLANS, AND ATTEMPTS IN PATIENTS WITH CHRONIC PAIN: A PROSPECTIVE QUALITATIVE RESEARCH

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INTRODUCTION

The association between suicidal ideation and pain has not received as much attention as association between suicidal ideation and psychiatric disorder. The suicidal act, whose outcome can be fatal or non-fatal is preceded by a plan, and that plan is preceded by suicidal ideation.

OBJECTIVE

The aim of this prospective study was to establish if patients with chronic pain associated or not to psychiatric disorder and suicidal ideation will end in a suicidal act.

PATIENTS AND METHODS

325 individual with suicidal ideation (244 women, 81men, aged 19-58 years) with pain associated with psychiatric disorders or not. The patients were analysed through serial unstructured interviews and before through: AMP Portuguese version; HDRS-17 (depression); HAMAS (anxiety); CGI (severity and improvement); MMSE (neuropsychological). Patients were submitted to treatments: pain and psychiatric disorders.

RESULTS

201 patients with pain associated with psychiatric disorders only made suicidal plan.

124 patients with pain without psychiatric disorders: 70 only made a suicidal plan; 54 patients only presented suicidal ideation.

CONCLUSIONS

As a result the author concluded that the suicidal ideation and the suicidal process is not always an expression of pain associated with psychopathological behavior.

EFIC5-0840

Pain treatment (conservative): Novel therapeutic agents

PHARMACODYNAMICS (PD), PHARMACOKINETICS (PK), SAFETY, AND TOLERABILITY OF MIROGABALIN WHEN COADMINISTERED WITH TRAMADOL: RESULTS FROM A RANDOMIZED, DOUBLE-BLIND, DRUG-DRUG INTERACTION STUDY

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Background and Aims: Mirogabalin (DS-5565) is a preferentially selective $\alpha 2\delta$ -1 ligand intended for treatment of neuropathic pain and pain associated with fibromyalgia. This study evaluated the potential for PD or PK interactions between mirogabalin and tramadol in healthy subjects.

Methods: This was a 4-treatment (placebo/placebo; mirogabalin 10mg BIDx2 days [d]/placebo; placebo/tramadol 100mg day2; mirogabalin 10mg BIDx2d/tramadol 100mg day2), 4-period crossover study with a wash-out of ≥ 6 d. PD was assessed using digit symbol substitution test (DSST), brief ataxia rating scale (BARS), vertigo symptom scale (VSS), and Bond and Lader visual analogue scale (Bond&Lader) over 48h post-dose on day 2. PK of tramadol and mirogabalin were measured over 24h and 48h post-dose, respectively.

Results: 30/32 enrolled subjects completed the study. There were no statistically significant differences between treatments at any time point in DSST or Bond&Lader assessments (**Figures 1&2**). BARS scores increased transiently following mirogabalin/tramadol coadministration. VSS increased significantly versus placebo with tramadol administration, but no greater effect was observed with the addition of mirogabalin (**Figure 3**). VSS scores were higher up to 6h post-dose with mirogabalin alone vs 12h post-dose for tramadol alone. Mirogabalin/tramadol coadministration decreased peak (28%), but not total, mirogabalin exposure. Mirogabalin/tramadol coadministration did not affect tramadol PK. Overall, most common adverse events were nausea (25.0%) and headache (12.5%).

Figure 1. LSMeans and 95% CI for Change from Baseline in DSST Total Number of Correct Substitutions Versus Time

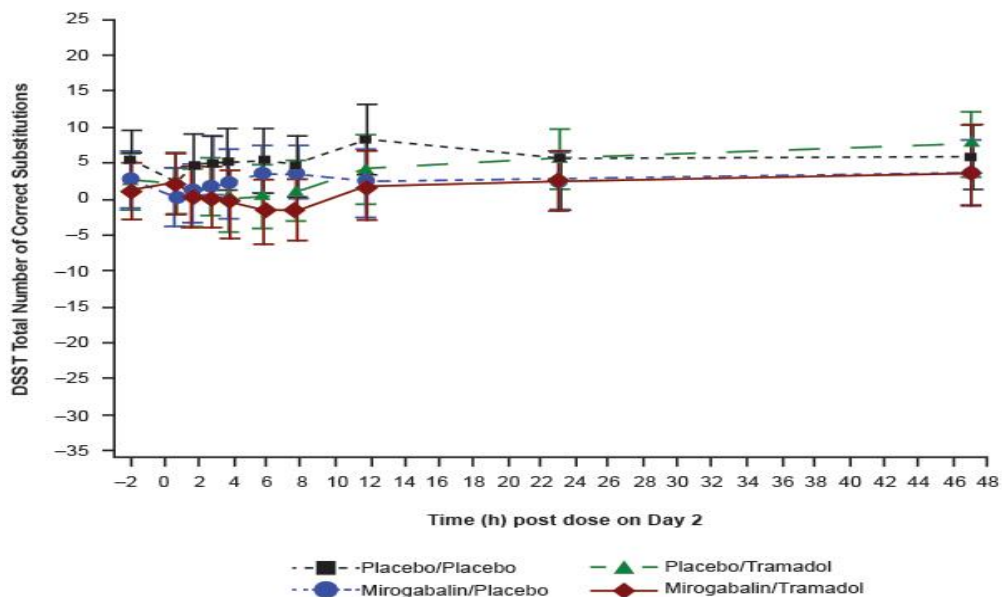


Figure 2. LS Means and 95% CI for Change from Baseline in Bond & Lader VAS Alertness Score Versus Time

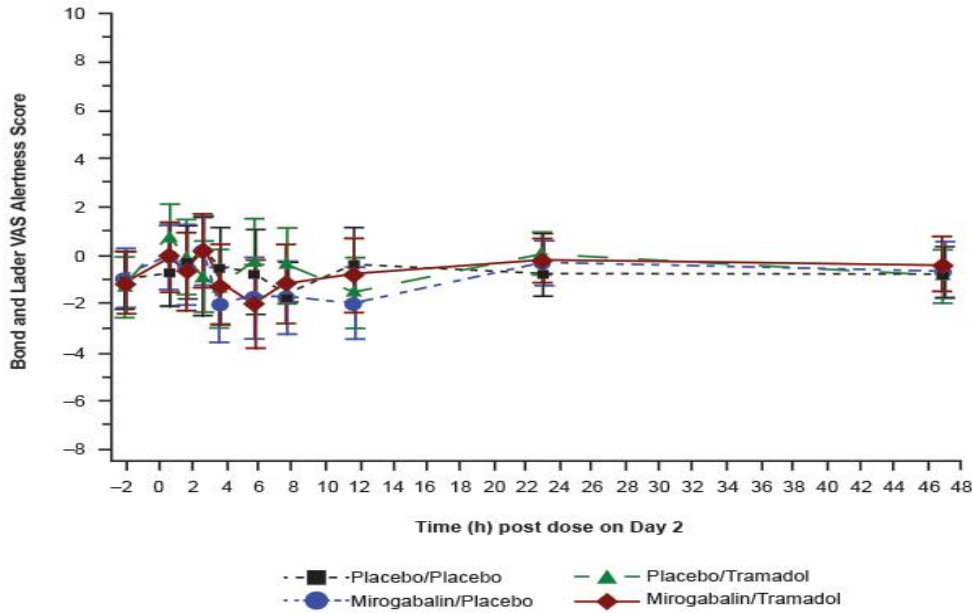
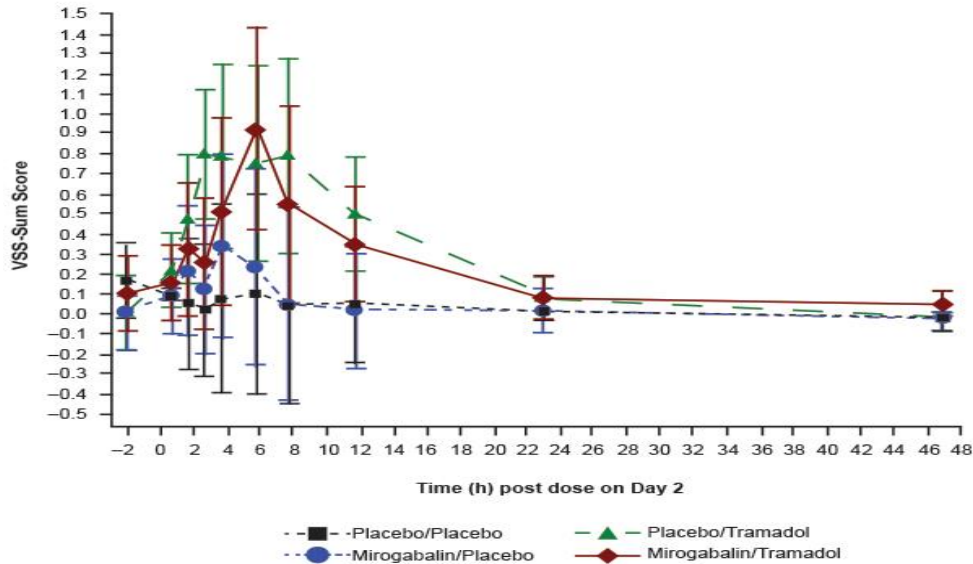


Figure 3. LS Means and 95% CI for Change from Baseline in VSS-Sum Score Versus Time



Conclusion

Mirogabalin/tramadol coadministration did not substantially change PD parameters as compared with tramadol alone nor did it affect total PK of either compound. Mirogabalin/tramadol coadministration was well tolerated in this single-dose study.

EFIC5-0876

Pain treatment (conservative): Novel therapeutic agents

TAPENTADOL: DAY TO DAY PRACTICE

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Background and aims

Tapentadol prolonged release (PR) is a novel, centrally acting analgesic for the treatment of chronic pain, characterized by two synergistic mechanisms of action (μ -opioid [MOR] agonism and noradrenaline reuptake inhibition [NRI]).

Its efficacy, safety and tolerability have been demonstrated but does it conform with our day to day activity and experience?

Methods

Authors reviewed the database from the Pain Unit of Leiria's Public Hospital (Portugal) to analyze the patients who started tapentadol PR (100-250 mg twice daily). Tolerability, pain intensity, concomitant analgesic treatment and diagnosis involved in prescription were documented.

Results

392 patients, treated for a mean period of 6 months (doses titrated during the first month) were analyzed. Of those, 67 suspended tapentadol mostly because of gastrointestinal disorders and dizziness (76%). Some of the 325 patients left also had nausea and vomiting (15,5%), constipation (39%) and dizziness (23%), but they weren't severe enough to suspend tapentadol.

Patients reduced average pain intensity (Visual Analog Scale) by 1,5 during the observation period. The most prevalent diagnoses were osteoarticular pain and low back pain (1,36 and 1,4 reduction in pain intensity, respectively). In the baseline visit, none of the patients had a score under 4 and 50% were above 6. In the end of observation, 23% were under 4 and 27% above 6 and none had a 10 score. Most of the patients had concomitant analgesic therapeutic.

Conclusions

Like most scientific literature reports, our observation study proves Tapentadol PR's tolerability, safety and efficacy.

EFIC5-0884

Pain treatment (conservative): Novel therapeutic agents

NOVEL P2X4 RECEPTOR ANTAGONIST NCP-917 ATTENUATED ALLODYNIA INDUCED BY SCIATIC NERVE INJURY.

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Background and aims

The P2X4 receptor (P2X4R) on activated spinal microglia plays an important role on developing neuropathic pain. Through the joint research with Nippon Chemiphar Co. Ltd. and Kyushu University, we identified a novel, potent, orally administrable and selective small-molecule antagonist that inhibits the P2X4R across species and that has pharmacological (or analgesic) effects in experimental neuropathic pain models. The purpose of this study is to uncover the pharmacological profile of NCP-917.

Method

To investigate P2X4R antagonism of NCP-917, Ca^{2+} imaging with Fura-2 and whole-cell patch clamp recording in cells expressing the P2X4R were performed. Furthermore, analgesic activity of NCP-917 was evaluated in rat model of L5 DRG neuron injured neuropathic pain (modified Chung model).

Results

NCP-917 indicated a potent antagonistic activity against ATP-stimulated P2X4R activation in Ca^{2+} imaging and electrophysiology assays.

Orally administered NCP-917 (3-10 mg/kg) in rats indicated enough CNS penetration to interact with the P2X4 receptors on spinal cord to conduct the attenuation of allodynia behavior in modified Chung model animals. On the other hand, NCP-917 did not have an influence on the motor coordination on a Rota-rod test (up to 60 mg/kg).

Conclusions

These results indicate that NCP-917 is a potent, selective P2X4 receptor antagonist.

And P2X4 receptor antagonists will be effective in patients who are intolerant of or refractory to other treatment for neuropathic pain, because treatment by P2X4 receptor antagonists is a completely new approach that specifically targets microglia.

PAIN MANAGEMENT IN EPIDERMOLYSIS BULLOSA (EB) - EXPERIENCE IN BIRMINGHAM ADULT EB SERVICE

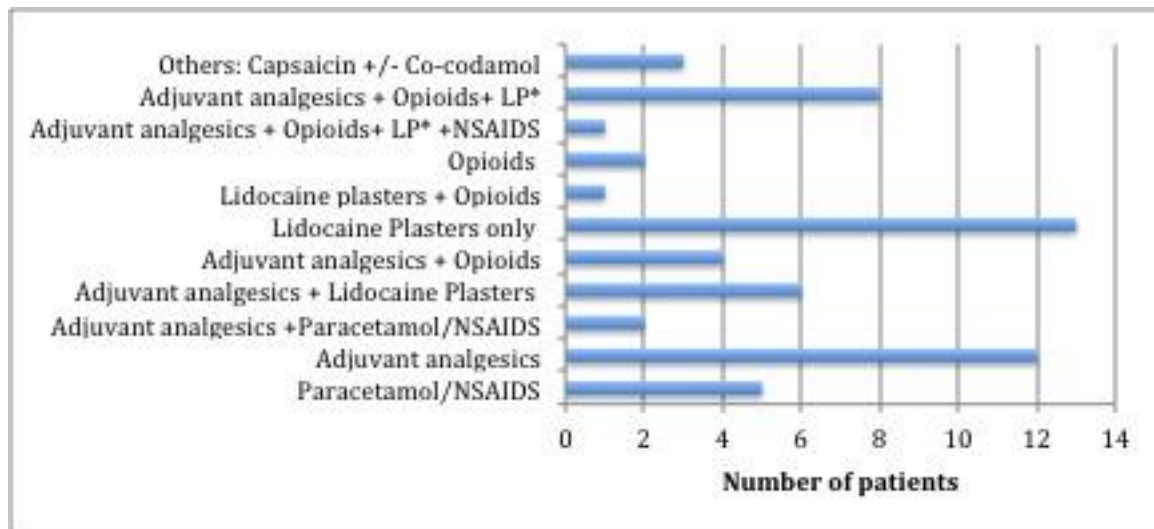
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Introduction: Epidermolysis Bullosa (EB) comprises a group of rare inherited disorder, which causes life long blistering and ulceration of skin and mucous membrane. The majority of patients with milder forms of EB may not seek medical help while those with more severe forms require life-long multi-disciplinary input from different specialists. Some forms of EB have multi-system effects and patients often present with chronic pain affecting their quality of life. The expertise in patient care is often restricted to a few specialized centers.

Methods: Retrospective analysis of our database on the number of EB patients seen, severity and pharmacological intervention instituted.

Results: 160 patients are diagnosed with EB. 106 with milder forms whilst 54 patients have severe forms of EB. Of these 57 patients (35.6%) had some form of pain therapy instituted. The chart below gives an overview of analgesics instituted.



* LP= Lidocaine Plasters

Discussion: In our multidisciplinary clinic patients with EB are assessed and the nature of pain is established by thorough history and examination. Patient with nociceptive pain are instituted as per WHO analgesics ladder whilst patients with neuropathic pain are started on either Tricyclic or Gabapentinoids as first line agents. In patients having suboptimal or no response, second line agent such as Lidocaine plasters or Serotonin-Noradrenaline re-uptake inhibitor is considered. Opioids are usually commenced as a third line treatment for patients who failed with the above treatment. Lidocaine plasters has been increasingly used in our clinical with encouraging success and further studies are needed to confirm this.

NEUROPATHIC PAIN IN INFANTILE RHEUMATOID ARTHRITIS TREATED WITH A NEW ELECTROMAGNETIC EMISSION DEVICE WITH TRANSCUTANEOUS MONOPOLAR CAPACITIVE APPLICATION

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BACKGROUND AND AIMS

The aim was to evaluate the efficacy of the Physicalm, a non-invasive electromagnetic emission monopolar capacitive transcutaneous analgesic device in the treatment of refractory chronic neuropathic pain associated with infantile rheumatoid arthritis.

METHODS

A 13-year old girl diagnosed with idiopathic polyarticular rheumatoid arthritis and with an 8-month history of constant pain (VAS of 9) in the left ankle that irradiated to the inner surface of the tibia. Examination revealed allodynia and mechanical hyperalgesia to heat and to pressure on the outer surface of the ankle, with total loss of articular mobility. She reported sleep alterations. No analgesia had been achieved with previous therapies. After the diagnosis of type II CRPS in left foot, with a positive DN4 questionnaire, she was prescribed with repeated daily sessions of an individualized analgesic modality, specific for neuropathic pain, using Physicalm®. She was followed up for three months, measuring her analgesic response (VAS), quality of life (SF-12), and sleep (MOS), and testing her articular mobility.

RESULTS

At three months, after 11 sessions, the continuous pain had reduced from VAS of 9 to 1, with no irradiation and disappearance of the allodynia and hyperalgesia. She recovered articular mobility and started to walk. Her quality of life improved and her sleep pattern normalized. No adverse effects were observed.

CONCLUSIONS

Physicalm® proved to be a safe and effective treatment in a case of neuropathic chronic pain associated with infantile rheumatoid arthritis. Further studies are required to evaluate the incorporation of this technique into routine clinical practice.

SLEEP IN PATIENTS WITH DYSTONIA: A SYSTEMATIC REVIEW ON THE STATE OF RESEARCH AND PERSPECTIVES

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Patients with primary dystonia, the third most prevalent and often painful movement disorder, suffer from a markedly reduced quality of life. Recent research proposes that this might be mediated by non-motor symptoms, including sleep disturbances. Characterizing and treating sleep disturbances might provide new inroads to improve relevant patient-centred outcomes. This review critically evaluates the state of research on sleep in patients with dystonia and outlines an agenda for future research. Peer-reviewed publications reporting on sleep in patients with primary dystonia were included. Of 1,445 studies identified through the search strategy, 18 met the inclusion criteria. In total, the included studies reported on 708 patients diagnosed with focal dystonia (cervical dystonia or blepharospasm), torsion dystonia, and dopa-responsive dystonia. The results indicate that at least half of the patients with focal cranial dystonia suffer from sleep disturbance, but excessive daytime sleepiness is uncommon. Sleep disturbance is associated with depressive symptoms. The frequency and duration of dystonic movements is markedly reduced during sleep. Reduced sleep quality appears to persist after treatment with botulinum toxin that successfully reduces motor symptoms. The findings are limited by a high clinical and methodological heterogeneity. Future research is needed to i) further characterize subjective and PSG sleep in patients with different types of dystonia, ii) determine the aetiology of sleep disturbances (e.g., abnormal brain function associated with dystonia, side effect of medication, psychological reasons, pain), and iii) test whether targeted sleep interventions improve sleep and quality of life in patients with primary dystonia.

CENTRAL PAIN PROCESSING IN PATIENTS WITH CHRONIC SHOULDER PAIN: A SYSTEMATIC LITERATURE REVIEW

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BACKGROUND & AIMS: Shoulder pain is a common health problem in which changes in shoulder structure or function cannot always explain the perceived pain. The goal of the present study is to systematically review the scientific literature addressing the role of central sensitization and central pain processing in patients with chronic shoulder pain.

METHODS: A systematic literature search was conducted in Pubmed and Web of Science using different keyword combinations. Original studies were included that refer to central sensitization in patients with shoulder pain. Articles fulfilling the inclusion criteria were screened for risk of bias by 2 independent raters.

RESULTS: Fifteen full-text articles were included, of which the majority were cross-sectional studies, followed by case-control studies, prospective cohort studies and randomized controlled trials. Methodological quality was rather low. Studies were clustered on those studying patients with musculoskeletal (MSK) shoulder pain and those studying patients with hemiplegic shoulder pain (HSP). Preliminary evidence for central hypersensitivity in MSK patients is available. Quantitative Sensory Testing revealed hyperalgesia for pressure pain in MSK shoulder pain patients, whereas these results were inconsistent in patients with HSP. Conditioned pain modulation was reduced in MSK patients, but not in the HSP-group compared to pain-free controls. In response to exercise MSK patients showed however only primary hyperalgesia.

CONCLUSION: Hyperalgesia and allodynia, as well as impaired conditioned pain modulation appear indicative for the presence of CS in MSK shoulder pain patients. Additional research is required to further investigate the presence of CS in different types of chronic shoulder pain.

HOW IS LOW BACK PAIN MANAGED IN PRIMARY CARE? A GLOBAL SCOPING REVIEW

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Background and aims: Low back pain (LBP) is the leading cause of disability worldwide and is associated with high disease burden. Clinical Practice Guidelines (CPGs) exist, however, little is known about their use in practice. To improve knowledge translation, this study aimed to synthesize the evidence-practice gaps in LBP management.

Methods: A scoping review using a sensitive search of 'CPGs' and 'LBP' was performed in MEDline, CINAHL and Pubmed. CPG implementation quality was assessed using the AGREE quality checklist.

Results: Included studies were predominantly cross-sectional surveys (n=22) with , discussing organizational barriers and cost implications, and presenting key monitoring criteria.

Conclusions: While the studies in this review had significant limitations a number of important evidence-practice gaps in LBP management were identified. Barriers to implementation of CPGs included CPG specific characteristics as well as the patients' views on appropriate care. Future research should determine the most appropriate and targeted implementation strategies to overcome these barriers and reduce evidence practice gaps.

NEUROPATHIC PAIN FOLLOWING TRAUMATIC AND NON-TRAUMATIC SPINAL CORD INJURY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: To systematically review the prevalence of neuropathic pain (NP) following spinal cord injury (SCI). NP post SCI is classified as above, at or below level NP based its presentation relative to level of injury. NP is often chronic, complex in diagnosis and refractory to therapy. No consensus on the prevalence of NP post SCI exists.

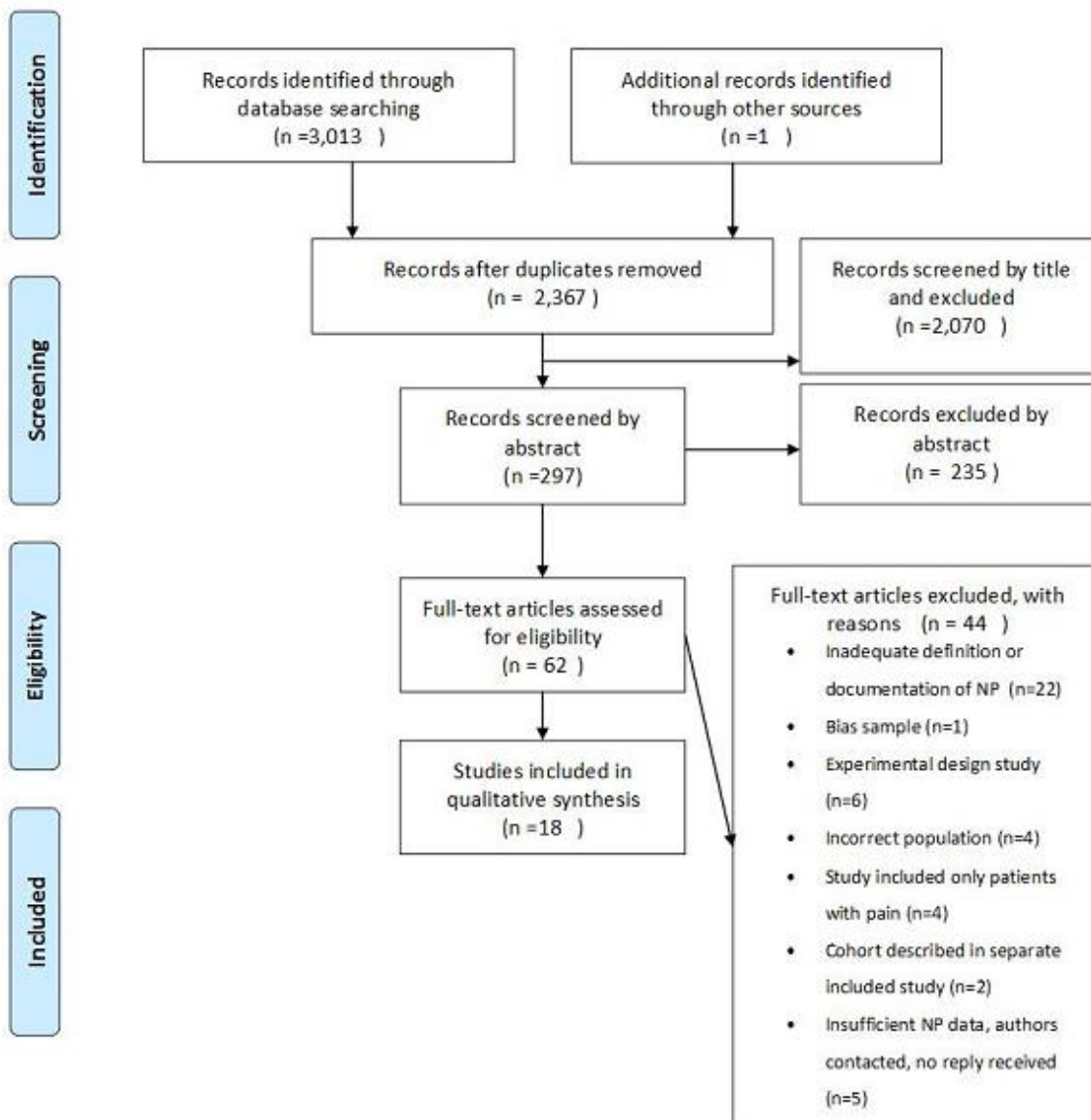
Methods: A standardised search strategy was employed across six electronic databases: PubMed, Embase, Web of Knowledge, CINAHL, The Cochrane Library and the Physiotherapy Evidence Database (1945–2014). Limits of English language and human studies were applied. Trials reporting the prevalence of NP in adults with both traumatic and non-traumatic SCIs were included. One reviewer excluded articles by title. Two reviewers excluded remaining articles by abstract and full text. One reviewer extracted data under a standardised form. Two reviewers assessed study quality based on the recommendations of Leboeuf-Yde and Lauritsen (1995) and Walker (2000).

Results: Eighteen full-text articles, five prospective studies, ten cross-sectional studies and three retrospective studies (n= 2,422 participants) recorded mean neuropathic pain point prevalence of 51.5% (sd17.6). The median quality score for included studies was 14 (range 10-17 out of a maximum of 18). Only five studies stated the recall period for reported neuropathic pain. Validated tools for assessment of neuropathic pain were employed in four studies.

Conclusions: There is a high prevalence of NP following SCI reported in the literature but rates varied between studies. Standardised methods of diagnosis, validated NP screening tools and prevalence recall periods are required in future studies.



Figure 1.
PRISMA 2009 Flow Diagram



EFIC5-0112

Pain treatment (conservative): Topical analgesics

EFFECTS OF ETHYL CHLORIDE SPARY ON PAIN DURING CAUDAL EPIDURAL INJECTION

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Background and aims: To compare the effects of ethyl chloride spray and local anesthesia injection for reducing pain induced by spinal needle insertion through the sacral hiatus.

Methods: In total, 61 patients who underwent caudal epidural injection were randomized into the ethyl chloride spray group or local anesthesia injection group. Before the insertion of a 20-gauge spinal needle, the subcutaneous tissue was infiltrated with 3 ml of 2% lidocaine in the injection group and ethyl chloride spray was applied just before the needle insertion in the spray group. Then, 100-mm visual analog scale (VAS) to evaluate the pain intensity of spinal needle insertion and a five-point Likert scale for patient satisfaction and preference for repeated use were compared between the two groups.

Results: VAS score for pain intensity was significantly lower in the spray group (34.3 ± 13.9) compared with the injection group (48.5 ± 18.4). Patient satisfaction and preference for repeated use were not significantly different between the two groups.

Conclusions: Ethyl chloride spray can effectively reduce pain of spinal needle insertion during the caudal epidural injection.

EFIC5-0350

Pain treatment (conservative): Topical analgesics

EFFICACY OF HYALURONIC ACID IN SMALL JOINTS OSTEOARTHRITIS (OA)-THE RESULTS OF MULTICENTER RANDOMIZED PLACEBO-CONTROLLED STUDY

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Aim of study: Assessment of the efficacy, tolerability and period of aftereffect of the single administration into 1st carpometacarpal and 1st metatarsophalangeal OA joints of 1.0 ml (20mg) of hyaluronic acid (Durolane) as compared with placebo.

Material and methods: The study included 120 pts with OA of small hand joints or feet, pain intensity >40 mm by VAS and consisted of two phases: "blind" phase up to 24 weeks, period of assessment of long term efficacy results – 48 weeks. The efficacy was assessed by 40% pain subsiding, index AUSCAN (for the hand) dose of NSAID, total effect assessment.

Results of "blind" phase of study: Both groups were comparable by basic clinical criteria. 40% pain subsiding by VAS (mm) was noted in experimental group to 24th week in 79.7%, in the placebo group–30% (chi-square: $p < 10^{-5}$), relation of chances (OR) equal to 9.1 (3.9-21.1). Dispersion analysis of pain, stiffness and function of AUSCAN index revealed reliable differences between Durolane and placebo. Statistically significant difference ($p < 0.0001$) according to assessment of general condition by the doctor and patient were found out in experimental group from the 4th week and were stable till 24th week. Adverse effects related to the therapy were not found. NSAID dose was decreased in 45.7% in experimental group and in 30% in placebo group.

Conclusion: High efficacy and considerable duration of aftereffect of single administration of Durolane SJ (small joints) as compared with placebo was demonstrated. After follow-up phase (48 weeks) additional data on long term effects will be reported.

EFIC5-0473

Pain treatment (conservative): Topical analgesics

PREDICTIVE SCORE FOR CAPSAICIN PATCH (8%) THERAPY RESPONSE

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Background and aims

The high concentration (8%) capsaicin patch is an established therapy for peripheral neuropathic pain. We aimed to define predictive parameters for therapy response.

Methods

63 patients with peripheral neuropathic pain who underwent capsaicin patch treatment were evaluated.

Based on data of quantitative sensory testing (QST), pain intensity, physical, social and psychological parameters, a set of predictors for therapy response had to be identified utilizing logistic regression in SPSS.

Results

A statistical model has been developed, which is characterized by significant influence of allodynia (ALL), paradoxical heat sensations (PHS) and additional pain disease (APD) on the therapy outcome.

Therapy success has the highest expectation (90.8%) on patients with distinct ALL, no PHS and APD.

Conclusions

The QST parameters ALL and PHS, but not psychological factors, physical impairments and chronicity of pain, have a predictive value for the therapy success of the capsaicin patch.

A predictive score consisting of ALL, PHS and APD provides prognostic references to therapy outcome. The parameter 'additional pain disease' has to be validated in further studies.

EFIC5-0511**Pain treatment (conservative): Topical analgesics****A DELAYED ONSET MUSCLE SORENESS (DOMS) MODEL FOR THE EVALUATION OF TOPICAL ANALGESICS**

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This delayed onset muscle soreness (DOMS) pilot study attempted to answer three questions, 1) does the method of insult provide sufficient baseline pain (≥ 5 on NRS [0-10 scale]), 2) does the DOMS pain respond to topical analgesics, 3) which pain assessment (PI rest, PI motion or PR) was the most sensitive for measuring treatment effects? Normal healthy volunteers were asked to perform 100 preacher (bicep) curls utilizing 80% of their maximum tolerated weight. They were then asked to perform 50 additional curls. Subjects returned to the clinic after 2 days to determine if their baseline pain was sufficient to proceed with treatment. Subjects were assigned to receive either a topical diclofenac patch Q12 hours or no treatment. Subjects were then assessed over the next 48 hours inpatient period. Pain intensity (with motion or at rest) and pain relief were assessed. Twenty subjects were included with 13 qualifying for treatment assignment (10 active (A), 3 control (C)). Mean baseline PI scores were 5.8 at rest and 7.2 with motion across both treatment group. Endpoints are presented below:

Endpoints	Time Period
	0-48 hours
TOTPAR (A)	99.900
TOTPAR (C)	29.500
SPID Motion (A)	211.000
SPID Motion (C)	2.375
SPID Rest (A)	208.838
SPID Rest (C)	-7.583

Based on the data from this pilot study, we conclude the DOMS model using the preacher (bicep) curl insult does 1) provide sufficient baseline pain; 2) DOMS is treatable with a topical analgesic. All three assessments demonstrated efficacy however the pain intensity with motion produced the greatest baseline pain.

SPECIAL DEDICATED ACUTE PAIN SERVICES IMPROVE THE NUMBER OF PAIN MEASUREMENTS IN POSTOPERATIVE PATIENTS

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Background and aims

This study aimed to investigate the relationship between specific characteristics of acute pain services (APS) and the quality of postoperative pain management in hospitals in the Netherlands.

Methods

A digital questionnaire survey was sent to all Dutch hospitals performing surgical procedures. APS characteristics of these hospitals and national open access data of quality indicators of postoperative pain management of the Health Care Inspectorate (i.e. percentage pain measurements and percentage pain scores above 7) from these hospitals were analyzed. Linear regression analyses were used investigating associations between variables.

Results

Completed questionnaires were received from 80 hospitals (83%), of which 90% had an APS team. Of these 58% of APS teams are “special dedicated”. The presence of a special dedicated APS induces a higher percentage of pain measurements in the hospitals compared to hospitals with an integrated APS team (Regression Coefficient (RC): 8.539; 95% Coincidence Interval (CI): 0.706-16.371). Hospitals with an educated pain professional in the APS have a lower percentage of pain measurements (RC-19.048; CI: -32.148- -5.947) and a higher percentage of pain scores above 7 on a NRS (RC: 4.401; 95% CI: 0.751-8.052), compared to hospitals without these professionals in the APS.

Conclusion

The type of APS and the presence of an educated pain professional relate to the outcome of quality indicators of postoperative pain in hospitals. These two aspects need to be addressed when APS teams are formed or reorganized.

APS OUT-PATIENT CLINIC – THE HELSINKI EXPERIENCE

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Background and aims: Persistent postoperative pain (PPP) is a significant clinical problem. The challenge is to identify the patients at risk of developing persistent pain and to create a targeted care pathway to ensure effective treatment. This study describes the two first years of an Acute Pain Service Out-Patient Clinic (APS-OPC).

Methods: Characteristics, risk factors (1) and treatment of prolonged postsurgical pain for the first 180 patients referred to our APS-OPC were collected from medical records.

Results: Treatment included tapering of acute pain medications, and if necessary, introduction of neuropathic pain medications, psychological or physiotherapeutic interventions. The median age of the patients was 47 years (range 15-83), 73 were male and 107 female. The type of surgery was: thoracic 42%, orthopaedic 27%, and other 31%. The median number of risk factors for PPP/patient was 5 (0-9). The average duration of treatment was 2,9 months (0,5-10), the median number of physician appointments 1 (0-7) and phone calls 2 (0-11), single appointment/call in 23%. Psychologist consultation was used in 19% of the patients, and 21% were referred to the multidisciplinary pain clinic. At discharge after surgery 30% needed strong opioids, 54% weak opioids and 71% gabapentinoids. At discharge from APS-OPC these numbers were 6%, 20% and 43%, respectively.

Conclusions: APS-OPC is a new “bridge” between acute and chronic pain management. It offers a safe way to extend effective multimodal postoperative analgesia to home and a possibility to prevent the development of PPP.

1. Katz J, Seltzer Z. Expert Rev Neurother 2009.

A COMPREHENSIVE POLICY FOR PAIN MANAGEMENT IN THE BELGIAN GENERAL HOSPITALS

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Background and aims. As in many European countries, attention for pain in Belgium dates back to the early 70's, which were characterized by fragmented initiatives in pain management and policy. Recently, the Federal Public Service Health (FPS Health) installed a comprehensive pain policy by contracting Belgian hospitals. This study presents a preliminary evaluation of the implementation of this policy.

Methods: FPS Health provides 3 type of contracts: a contract for every general hospital (n=105), a specific contract for multidisciplinary teams for the treatment of chronic pain (CP) (n=35), and a specific contract concerning pain management in children (n=13). The final objective is the organization of regional networks to establish broad sensitization and education of personnel, early detection and strategies to prevent chronification, and development of care pathways. An annual lump sum of 17 million € was provided.

Results: The first annual reports (after 6 months) revealed that 382 FTE (110 FTE medical; 272 FTE non-medical) were involved. 75 % of all Belgian hospitals participated in a formal network. More than 750 network activities were reported by the different centers, of which 54% for internal and 46% external target groups. In 27% the external activities were open for primary care. Activities were focused on formation (43%), organization (37%) and peer-review (20%).

Conclusion: With this initiative the Belgian government has deployed a basis for a stable and comprehensive nationwide policy in pain management. The initial results are promising, and further follow-up and guidance are planned.

EFIC5-0870

Epidemiology, assessment, organisation of pain treatment: Acute pain services

ANTWERP PERSONALISED PAIN INITIATIVE (APPI): COMBINING SEVERAL MEASURES IN AN UNIVERSITY HOSPITAL TO PREVENT CHRONIFICATION OF PAIN.

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Background and aims. Chronic pain remains a major health care problem. Despite progress in therapeutic options, chronic pain remains a challenge.

Methods: In the last 10 years we developed several measures to aggressively treat acute pain (mostly postoperative pain). As such, we introduced a pre-operative risk score to predict the occurrence of severe pain post surgery. In addition, we developed a system in which each patient receives an individualized pain kit for the treatment of pain after day care surgery (from 2 to 5 days after the operation). Finally, we recently introduced a system in which patients after inguinal hernia repair and shoulder surgery receive a treatment with locoregional analgesia and ambulatory pain pump during 5 days at home.

Results: Identification of patients at risk for severe postoperative pain has significantly facilitated by the introduction of the pain risk score. On the basis of pre-operative patient characteristics a score from 2 to 10 can be obtained. A score ≥ 4 leads to the application of a multimodal analgesic protocol per-operatively. The introduction of patient-specific pain kits in day care center has improved the overall patient satisfaction rating from 62% to 87%. The most therapy-resistant pain syndromes after day surgery (inguinal hernia repair and shoulder decompression) are now being treated by prolonged loco-regional analgesia at home, but this leads to several practical problems which are currently sorted out.

Conclusion: Introducing a combination of several treatment protocols did result in a significant reduction of postoperative pain in our tertiary hospital.

EFIC5-0353

Pain treatment (conservative): Complementary and alternative medicine

TESTING THE CAPABILITY OF A NEW PLACEBO ACUPUNCTURE NEEDLE IN PRACTITIONER BLINDING.

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Background and Aims

The development of a placebo needle for acupuncture research constitutes an historical challenge. New devices recently emerged but several limitations still exist. This pilot study developed a new simplified placebo needle with potential for double-blinding and tested its capability for operator/practitioner blinding.

Methods

Acupuncture (penetrating) and placebo (non-penetrating) needles had identical visual characteristic. The system was made with three pieces of adhesive high density foam tape 5 mm thick with perforations for a needle-guidance tube. For the placebo system an acupuncture needle and the guidance tube was shortened, in order that after the needle was tapped it would not prick the skin.

Three experienced acupuncturists participated. Each one applied one set of 10 random penetrating/non-penetrating needles in the acupuncture point LI4. Each acupuncturist filled a questionnaire regarding whether each needle was penetrating, non-penetrating or cannot tell. Chi-squared and Fisher's exact test were used to analyze the data. Ethical approval was obtained.

Results

No differences were found within operators regarding whether they were able to identify the penetrating needle ($p=0.192$). Out of the 30 needles, operators were able to correctly identify 7 needles (23%). Operator #1 correctly identified 2/10, operator #2 4/10 and operator #3 1/10.

Conclusions

This system showed high potential for operator blinding, suggesting the possibility for a larger study with a bigger sample size and also testing the capability for patient masking.

Acknowledgements

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BUILDING A COMMUNITY OF PRACTICE AS A TOOL FOR SHARING AND BUILDING KNOWLEDGE OF CRPS REHABILITATION CARE

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Background and aims: Complex Regional Pain Syndrome (CPRS) is a rare disorder characterized by persistent pain that is disproportionate to any preceding injury. Little is known however about the effectiveness of the existing therapeutic and management options for rehabilitation care of CRPS. Furthermore, specialists will only encounter a few cases each year, making it difficult to gain expertise. A community of practice (CoP) about CRPS was developed as a means to facilitate the sharing and building of knowledge among rehabilitation specialists.

The aim of this study is to examine how a CoP can be utilized as a catalyst to share knowledge in the field of rehabilitation and improve the management of CRPS.

Methods: Several activities were proposed to facilitate knowledge sharing and building between members, including in-person meeting, case discussions, guest speaker conferences and communication through an online platform. A questionnaire on current practice and knowledge was administered at the onset of the project (T1, N=32) and at 6 months (T2, March 2015).

Results: Thirty-five participants from 20 sites joined the CRPS-CoP. Preliminary results from T1 show that few participants consider having sufficient knowledge (38%) or tools (22%) in regards to CRPS. Participants demonstrate lack of confidence in talking about care (55%) and prognosis (71%) with patients. Results from T2 will identify changes after 6 months.

Conclusions: The use of a CoP as a tool for the gaining and sharing of CRPS knowledge is a promising avenue to improve the quality of care for patients with this rare disorder.

TRAIN-THE-TRAINER APPROACH FOR TEACHING ABOUT MANAGEMENT OF PAIN IN LOW RESOURCE COUNTRIES: WILL THIS LEAD TO SUSTAINABLE EDUCATION?

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Background and aims

Pain management is lacking in low resource countries. Reasons, amongst others, are limited resources for teaching and treatment and lack of awareness about pain. EFIC's Educational Committee, IASP's Developing Countries Working Group and NeupSIG, encourage ongoing education and efforts to raise awareness. One initiative is the 'Pain Schools in Low Resource Settings', aimed to empower local champions with knowledge in pain, so they can establish local pain schools with minimal ongoing input from external experts. The trainees become trainers in their country (=Train-the-Trainer, TtT).

Methods

International experts prepared and reviewed 12 talks about pain management. The talks are used to train the trainers in one-day workshops and as handouts for providers attending the lectures. Trainers are encouraged to adapt the talks to local conditions; they can translate them into the native language. We assessed short- and long term aims of the TtT concept: (1) could the talks be used for teaching healthcare professionals with no/little previous experience in pain; (2) would trainees give at least four talks during the year following the workshop.

Results

Four test workshops were carried out in Albania, Kenya, Serbia, Kosovo. In each, 10 – 12 physicians were trained; they gave the talks to their colleagues. Preliminary findings indicate that trainers were able to give 1-2 talks per year.

Healthcare providers will be able to set up new local schools by accessing the talks through the project's website.

Conclusions

We hope that the TtT strategy will be sustainable and facilitate improved pain management where employed.

EFIC5-0877

Ethics, education, history, law: Education / Professional

HOW TO APPLY FOR EFIC PAIN SCHOOL GRANTS

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Backgrounds and Aims:

The European Pain Federation Pain Schools are courses aimed at European medical doctors and paramedical personnel who are interested and want to gain more experience in pain medicine. These are at least 4-5 days regarding basic treatment of pain patients and all aspects of pain development. To be eligible for the school you need to be an European Pain Federation Chapter Member. In UK BPS members are EFIC chapter members

Methods:

To apply for EFIC Pain School there are two routes:

A) Self-funded:

Contact directly to the European Pain Federation Pain School directly via the email address.

- 1) EFIC Maribor Pain School: uros.maver@um.si or slavica.kersic@ukc.mb.si
- 2) EFIC Krakow Pain School: krakoweficschool@gmail.com
- 3) EFIC Klagenfurt Pain School: fortbildung@aekkt.at
- 4) EFIC Montescano Pain School: efic@defoe.it
- 5) EFIC Liverpool Pain School

B) EFIC Grant:

Need to apply through the national European Pain Federation Councillors. EFIC Council Members can appoint trainees for each school to attend. The applicants presented by the EFIC Councillors for EFIC grant are evaluated by the EFIC Education Committee and approved by the EFIC Executive Board. There is a maximum of 15 EFIC applicants per school.

Results:

I am pleased to say that my application for EFIC grant was approved by EFIC. It was supported by my Educational Supervisor and Clinical Director and by BPS President.

Conclusion:

I am sure by attending EFIC Pain School I will improve my knowledge and understanding of Pain Medicine which will help me for FFPMRCA exam and improve patient outcome.

EFIC5-0951

Ethics, education, history, law: Education / Professional

A STUDY TO EXPLORE THE RELATIONSHIP BETWEEN INTOLERANCE OF UNCERTAINTY AND THE TREATMENT ORIENTATION OF PHYSIOTHERAPY STUDENTS

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Background and Aims

Low back pain (LBP) is a common complaint characterised by uncertainty and may cause severe disability. Physiotherapists who are intolerant of uncertainty (IU) or have a biomedical treatment orientation make restrictive recommendations about patients' return to activity. The pain attitudes and beliefs of undergraduate physiotherapy students are shown to influence practice decisions negatively. The purpose of this study was to explore the relationship between IU and the treatment orientation of undergraduate physiotherapy students.

Methods

195 undergraduate physiotherapy students' treatment orientation and IU were investigated using two psychometric measures, namely the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS_PT) and the Intolerance of Uncertainty short scale (IUS-12). The relationship between the measures for the whole cohort and individual year groups were analysed as well as any differences between the year groups.

Results

A weak ($r=0.201$), but statistically significant correlation ($p<0.01$), existed between IUS-12 and PABS_PT. The PABS_PT and IUS-12 demonstrated significant differences between the year 3 students and the year 1 and 2 ($p<0.0167$). Final year students had a lower biomedical treatment orientation and lower IU.

Conclusions

A weak statistically significant correlation between IUS-12 and PABS_PT subscales was identified though its practical significance must be interpreted with caution. The significant difference between final year and years 1 and 2 showed final year students achieving similar scores to qualified physiotherapists. The IUS scores were high although final year students achieved significantly lower scores than year 1 and 2 students.

NURSE PAIN TRUSTEE: IS THERE A NEED FOR FORMAL QUALIFICATION?*J. Aviram¹, I. Lifshits², Y. Khomchuk³, I. Vishnevsky⁴, T. Adler⁵*¹Internal ward C, Rambam Medical Center, Haifa, Israel²Internal ward D, Rambam Medical Center, Haifa, Israel³Nephrology, Rambam Medical Center, Haifa, Israel⁴Dermatology, Rambam Medical Center, Haifa, Israel⁵Institute of pain medicine, Rambam Medical Center, Haifa, Israel

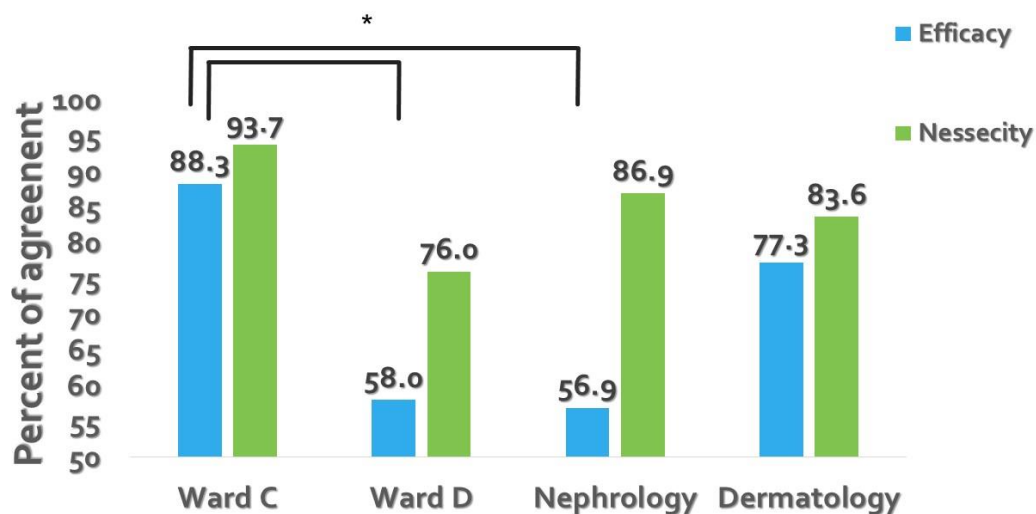
Background and aims: Pain treatment of is often inadequate in hospitalized patients and deficits in nurses' knowledge and attitudes are suggested as one reason. This study aimed to assess the difference in stands of nursing staff regarding pain management and pain trustees, accounting for the pain trustee in internal ward C underwent 120 hours qualification course.

Methods: 63 nurses (17 males\ 45 females) filled the questionnaire (Toronto pain management inventory, modified) at two different internal wards (C, N=23 and D, N=15) and in nephrology (N=13) and dermatology (N=11). Additionally, reports from the hospital computers (HCD) division regarding pain related consultations were used.

Results: One way ANOVA showed significant variation between wards in nurses satisfaction from their pain trustee efficacy (regarding patient improved care), post-hoc analysis showed that the significance was due to the difference that higher satisfaction was found in internal ward C, in comparison to internal ward D and nephrology (P

Conclusions: The position of nurse pain trustee can positively influence the standards of care given to hospitalized patients. Regarding the overload on pain specialists, lowering the amount of pain related consultations in the hospital may enable them to address the more complex patients.

Figure 1: Differences between wards regarding efficacy and necessity of the pain trustee



GREAT OCCIPITAL NERVE BLOCKADE IN CHRONIC CLUSTER HEADACHE

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Cluster headache is one of the most painful of the primary headache disorders. It is the most common trigeminal autonomic cephalalgia. Despite the availability of many treatments, %10-15 of the patients remains as chronic cluster headache patients who have remission less than 1 month in a year. The greater occipital nerve blockade (GON) is one of the therapeutic options which can be used as an acute or transitional treatment in this group of patients by interfering trigeminal activity. We present a 47 year old male patient with chronic cluster headache since 2 years. He had tenderness over right greater occipital nerve (ipsilaterally to the headache). His attacks were unresponsive to oxygen. Many prophylactic medical treatments including isoptin, lithium, valproic acid, topiramate and duloxetine failed. He received a series of 6 right occipital nerve blocks over 2 months. Each injection included 20 mg (0.5 mL) triamcinolone or 1.5 mL of 0.5% bupivacaine. After serial occipital nerve block injections the duration, frequency and intensity of the attacks decreased gradually. The patient was attack free for 2 months after the last blockade. In our case GON blockade was effective as a transitional treatment and the patient switched to episodic form of the cluster headache.

EFIC5-0223

Pain treatment (invasive): Nerve blocks, indwelling catheters

INTRADERMAL BOTULINUM TOXIN TYPE A FOR MANAGEMENT OF PATIENTS WITH PAINFUL DIABETIC PERIPHERAL NEUROPATHIES WITH ALLODYNIA AND HYPERALGESIA PHENOTYPE (CASE SERIES)

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Background: Botulinum toxin has been found to be useful in patients with neuropathic pain by reducing neurogenic inflammation in peripheral tissues.

Aim: To evaluate the effect of botulinum toxin on pain and mobility of patients with diabetes and painful peripheral neuropathy presenting as hyperalgesia and allodynia.

Materials and methods: 6 patients with severe allodynia and hyperalgesia on dorsum of feet were included. 2 were female with type 1 Diabetes, 4 were male with type 2 Diabetes, mean age 43, mean duration of diabetes- 12 years. We administered intra dermally 50-60 UI Botulinum toxin Type A (Botox®) on the more painful foot. We evaluated the patients 3 and 6 months later using Brief Pain Inventory(BPI) and Timed Get-up and –Go test (GUGO)

Results: 6/6 patients reported mean pain 10/10 before treatment. 4 were using walking aid with mean GUGO 45 sec. 2 patients were immobile and in wheelchairs. Pain interference with mobility was reported as 10/10 on BPI. 3 months after treatment 3/6 patients reported 80% reduction of pain on the treated foot and had a treatment with Botox on the other side; 2/6 reported 30% reduction of pain in both feet. 1 patient did not report improvement and was admitted for psychiatric treatment. 6 months later 2/6 patients were discharged with complete resolution of symptoms. 3/6 patients reported on-going benefit. Mobility improved in 4/6 patients by 15%.

Conclusion: Intradermal botulinum toxin improved clinical outcomes for patients with allodynia and hyperalgesia phenotype of painful diabetic peripheral neuropathy.

OUR EXPERIENCE WITH INTRAARTICULAR OZONE INJECTION THERAPY IN THE PATIENTS WITH GONARTHROSIS

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Objectives

In our study it was aimed to evaluate the efficacy of intraarticular ozone therapy in the patients with gonarthrosis in our department of algology.

Methods

In this study, 310 patients with gonarthrosis that were treated using 20% concentrated intraarticular ozone in 2010-2014 were included. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy, crepitation on knee, radiological grade, movement scores before and after the therapy and satisfaction scores after the therapy were recorded.

Results

In this study, 65 (20.9%) patients were male, 245 (79.0 %) were female. Mean age was 57.48 ± 8.35 . Mean initial VAS score was 7.92 ± 1.29 , 1 month after the therapy it was 3.09 ± 2.39 and 6 months after therapy it was 3.25 ± 2.45 . VAS scores of patients that had crepitation decreased more than the patients that had no crepitation on knee. It was found that 55 patients were grade 2, 190 patients were grade 3 and 65 patients were grade 4 according to radiological grade. VAS scores of grade 2 were decreased more than grade 4 according to pretreatment values. It was observed 262 (84.5%) patients were satisfied and 48 (15.4%) patients were unsatisfied. Movement scores were found higher after the therapy than the scores before therapy.

Conclusion

In conclusion intraarticular ozone therapy in the patients with gonarthrosis is an effective and satisfactory treatment method. We suggest using intraarticular ozone therapy especially in early grades of gonarthrosis.

OUR EXPERIENCE WITH INTRAARTICULAR PLATELET-RICH PLASMA INJECTION THERAPY IN THE PATIENTS WITH GONARTHROSIS

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Objectives

In our study it was aimed to evaluate the efficacy of intraarticular platelet-rich plasma therapy in the patients with gonarthrosis in our department of algology.

Methods

In this study, 150 patients with gonarthrosis that were treated using platelet-rich plasma were included. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy, crepitation on knee, radiological grade, movement scores before and after the therapy and satisfaction scores after the therapy were recorded.

Results

In this study, 42 (28%) patients were male, 108 (72 %) were female. Mean age was 58.42 ± 9.52 . Mean initial VAS score was 8.22 ± 1.14 , 1 month after the therapy it was 4.02 ± 2.27 and 6 months after therapy it was 3.21 ± 2.23 . VAS scores of patients that had crepitation decreased more than the patients that had no crepitation on knee. It was found that 22 patients were grade 2, 86 patients were grade 3 and 42 patients were grade 4 according to radiological grade. VAS scores of grade 4 were decreased more than grade 2 and 3 according to pretreatment values. It was observed 124 (82.6%) patients were satisfied and 26 (17.3%) patients were unsatisfied. Movement scores were found higher after the therapy than the scores before therapy.

Conclusion

In conclusion intraarticular platelet-rich plasma therapy in the patients with gonarthrosis is an effective and satisfactory treatment method. We suggest using intraarticular platelet-rich plasma therapy especially in late grades of gonarthrosis.

THE EFFECTS OF TRANSVERSUS ABDOMINUS PLANE BLOCK ON PATIENTS WHO HAD LOWER ABDOMINAL SURGERY UNDER GENERAL ANESTHESIA ON POST-OPERATIVE ANALGESIA AND PATIENT COMFORT

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Background and aims: Transversus abdominus plane (TAP) block was defined as a regional modality which provides analgesia on anterior wall of abdomen after the abdominal surgery in recent years. In this research, we aimed to investigate the post-operative analgesia quality and the effects on patient comfort.

Methods: This research was done on patients who are ASA group I-II and between 18-65 years old had lower abdominal surgery under general anesthesia. Our research was applied to 50 patients as 25 group I patients and 25 group II patients. Block was performed by administering bupivacaine 5% as 2 mg/kg to the first group. Heart rate, electrocardiography, noninvasive systolic blood pressure, diastolic blood pressure, mean arterial pressure and peripheral oxygen saturation values were watched before and during the surgery. Block was performed to the first group at the end of each operation before waking up from general anesthesia. Evaluation of the pain was asked for the patients by using VAS (visual analog scale) at post-operative 30th minute, 1st, 2nd, 4th, 6th, 12th and 24th hours.

Results: First need for analgesia was occurred at post-op 30th minute and after that there was no need of analgesia at group I patients. In group II patients, first need for analgesia was occurred at post-op 30th minute and after that there were repetitive needs for analgesia.

Conclusion: VAS values which were belonged to the patients who had TAP block were lower. In that patients there was no repetitive need for analgesia and they were mobilized early.

EFIC5-0413

Pain treatment (invasive): Nerve blocks, indwelling catheters

INTRATHECAL ZICONOTIDE: A PATIENT REGISTRY OF LONG-TERM EFFICACY, TOLERABILITY AND SAFETY IN REAL-WORLD CHRONIC PAIN PATIENTS

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Background and aims

Ziconotide was licensed by EMA in 2005. A post-marketing, open-label, long-term observational registry study (PRIME) was requested monitoring safety, efficacy and tolerability of intrathecal (IT) drug treatment (ziconotide and/or other) for severe chronic pain in real-world settings.

Methods

A registry was created of patients with severe chronic pain (any cause) ≥18 years, utilising ziconotide, opioids or other IT drugs or requiring initiation/switch of IT analgesia. Subjects continued until planned registry closure (12 months after last enrolment), provided they utilised IT analgesia. Physicians managed subjects' pain under real-world clinical conditions; data were collected for up to 4 years.

Results

163 subjects received ziconotide, 105 other IT therapy. 130 patients completed the study. Adverse event (TEAE) rates were similar between ziconotide patients and those on other IT therapies. Incidence of treatment-related TEAEs was higher for ziconotide (63.8%) versus other IT therapies (44.8%). This, was only marginally higher when expressed as incidence per subject year. Discontinuation rates were similar under ziconotide and other IT therapies, suggesting comparable tolerability. IT treatment was discontinued more frequently in ziconotide combinations than on ziconotide monotherapy.

POMS-SF measures were similar without evidence of increased risk of neuropsychiatric adverse events in ziconotide patients versus other IT therapies. Improvements in VASPI were observed for all groups, suggesting clinically relevant doses. Changes in VASPI scores were comparable.

Conclusions

Ziconotide offers effective IT treatment with acceptable tolerability and safety for patients with intractable pain in real-world conditions. Discontinuation rates suggest patients may find monotherapy more acceptable than ziconotide combinations.

EFIC5-0420

Pain treatment (invasive): Nerve blocks, indwelling catheters

INTRATHECAL BACLOFEN THERAPY AND SPASTICITY: A STIFF-PERSON SYNDROME CASE

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BACKGROUND AND AIMS

Stiff Person Syndrome (SPS) is an uncommon neurological autoimmune disorder characterised by progressive rigidity and muscle spasm. It typically develops in the spinal and lower extremities. Most patients have antibodies against the glutamic acid decarboxylase (GAD), a rate limiting enzyme in the production of gamma aminobutyric acid (GABA), the primary inhibitory neurotransmitter.

Treatment consists in combination of immunotherapy and drugs that increase GABA adrenergic tone.

Remissions are unlikely and prognosis is unpredictable

METHODS

We present the case of a 36 year old woman diagnosed of anti GAD positive SPS according to clinical and electrophysiological findings. She suffered from pain in both legs and walking difficulty of 2 years evolution.

She has been treated with oral diazepam, oral baclofen and immunotherapy with variable results. We offered the option of placing an intrathecal baclofen (ITB) pump as coadjuvant treatment and the patient agreed. A Medtronic Syncromed II ITB pump with a thoracic catheter at T8 was placed, with an initial dosage of 150 mcg per day, titrated progressively to 460 mcg per day.

RESULTS

ITB has demonstrated relief of painful muscular spasms. It could be useful for patients who do not tolerate oral medication or respond poorly to it.

Careful screening and monitoring are compulsory for patients being treated with ITB.

CONCLUSIONS

ITB may be a good alternative therapy for refractory SPS

EFIC5-0518

Pain treatment (invasive): Nerve blocks, indwelling catheters

EFFECT OF PREEMPTIVE EPIDURAL ANALGESIA ON POST-THORACOTOMY PAIN SYNDROME

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INTRODUCTION:

Post-Thoracotomy Pain Syndrome(PTPS) is classified as neuropathic pain. In this study, in patients undergoing thoracotomy operation in elective conditions, we aimed to compare PTPS development ratios between patients that had patient controlled analgesia(PCA) by receiving pre-operative epidural catheter and the patient that did not have PCA.

MATERIAL AND METHOD:

40 male cases were included in the study. Cases were separated into two as Group I(n:20) and Group II(n:20). In Group I cases, before induction of general anesthesia, at the T6-T7 or T7-T8 vertebral levels in right lateral position and on posterior midline, epidural area was accessed using 18-Gauge Tuohy needle. Group I cases recieved PCA device and it was started before induction of general anesthesia. 3 months after their thoracotomy operations, all cases were assessed for allodynia, hyperalgesia, burning-stinging pain and PTPS.

RESULTS: Assessment of allodynia led to one statistically significant difference between two groups and revealed that number of cases with allodynia was smaller in Group I(p=0.01). Assessment of hyperalgesia and burning-stinging pain did not reveal a significant difference between two groups (hyperalgesia p=0.07; burning-stinging pain p=1). Number of cases diagnosed with PTPS was 2(10%) in both groups and a statistically significant difference was not identified between two groups(p=1).

CONCLUSION: We are of the opinion that establishing preemptive analgesia with preoperative epidural catheter in patients undergoing elective thoracotomy did not change PTPS incidence but reduced allodynia incidence by preventing central stimulation in post-operative period.

EFIC5-0694

Pain treatment (invasive): Nerve blocks, indwelling catheters

A NOVEL ADD-ON THERAPY FOR NEUROPATHIC PAIN: INFILTRATION BLOCK WITH DICLOFENAC AND LIDOCAINE TO REDUCE TENSION AND PRESSURE ON NERVE TISSUE

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Background and Aims: A common cause of neuropathic pain is the tension of peripheral nerves originated from painful hypertrophic scars which were closed in a great tension. Excessive accumulation of collagens excreted from fibroblasts may cause wound retraction and influence the release of PGE2 and TGF- β cytokines(1). Here, we described infiltration block through the hypertrophic scar to reduce mechanical stress on femoral nerve.

Case: A 35 years old man who had femoral artery injury with gunshot underwent femoral artery repair with stent graft. He complained of burning, tingling, shooting, stabbing and stretching on his left leg. Physical examination revealed hypoesthesia and motor weakness. Electromyography demonstrated axonal degeneration of tibial and peroneal branches of sciatic nerve at the femoral level. The initial NRS was 10 and decreased to 6 after medical therapy and caudal steroid injection. The pain and sensory symptoms were no longer present at sciatic nerve dermatomes but burning sensation extending from frontal leg to foot fingers did not recover. Re-examination revealed increased burning sensation after palpating the scar tissue with pressure. Add-on therapy was performed with fan-like infiltration of 100 mg diclofenac and lidocaine in 10 mL solution through the scar tissue. The tension and contraction of the scar tissue resolved and the patient completely healed from pain and burning sensation.

Conclusion: The infiltration block with diclofenac and lidocaine may resolve the tension of the contracted scar tissue by tearing the adhesions. The eliminated mechanical compression would also reduce the pressure on nerve tissue and inhibit the release of cytokines.

EFIC5-0699

Pain treatment (invasive): Nerve blocks, indwelling catheters

FACE; UNUSUAL BODY REGION FOR MYOFASCIAL PAIN SYNDROMES

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Background and Aims: Myofascial pain syndromes (MPS) typically occur in a restricted region of the body with tenderness during palpation. Psychological evidence of neuropathic pain in MPS has also been demonstrated (1). Here, we described a patient with myoneuralgia who wasn't examined for chronic myofascial headache disorders although similar treatment modalities were repeated and most were failed during years.

Case: 45 years old woman treated with the diagnosis of trigeminal neuralgia for 7 years. She was performed trigeminal neurolysis and gamma-knife twice. She had pain on the left side of her face referring to orbital and frontal region. She had ptosis, retroorbital throbbing and shooting like pain, hemi-nasal congestion with hemi-facial rash. She had also burning and tingling sensation spreading from lips to forehead. Electric shock like pain and numbness were also present but were begun after neurolysis of trigeminal nerve. Her physical examination revealed tender points on her face and accurate palpation over the suspected trigger points allowed the development of referred pain. Her initial diagnosis was MPS and SUNCT. Initial NRS WAS 10. Medical therapy was reorganized with amitriptyline, tramadol, indometazin and gabapentin. Trigger point injections were performed to taut bands with lidocaine and diclofenac and repeated for 5 times. Stellate ganglion blockage with bupivacaine and dexamethasone was performed for retroorbital pain. NRS was 3 after 2 months. Add-on therapy was started with fluoxetine to resolve her fear about pain recurrence.

Conclusion: MPS should be kept in mind during evaluation of the causes of neuropathic pain symptoms in patients with headache disorders.

RETROSPECTIVE ANALYSIS OF PAIN THERAPY IN LUNG CANCER PATIENTS

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Background and Aims: Cancer patients are commonly managed with opioid and adjuvant therapies but % 5 to 10 still may have inadequate pain control with side effects (1). Regional techniques would be a method of choice in suitable patients. In this case series we evaluated 114 patients with lung cancer and reported their clinical response to pain management.

Case series: 114 patients admitted to pain clinic between 2012-2014 were retrospectively analyzed. The patient characteristics were age: $60 \pm 10,4$ y, male/female ratio: 89/25, $NRS_{initial}: 8,09 \pm 1,17$, painful period: $4,3 \pm 5,6$ m, $NRS_{post-therapy}: 3,9 \pm 1,05$. Pain characteristics were somatic (n=18), neuropathic (n=20) and mix (n=76). Pain aetiologies were bone metastasis (n=37), chemotherapeutics (n=24), RT (n=12), surgery (n=5), cancer tissue (n=36). 48 of them were treated with various medical strategies and 66 were applied regional techniques in addition to medication. Regional techniques were performed if pain regions were applicable for nerve blocks and included paravertebral (n=44) for chest and back pain, epidural steroid injections (n=21) for radicular metastatic pain and suprascapular (n=1) for shoulder pain after scapula metastasis. $NRS_{initial} (8,3 \pm 1,08)$ was higher, $NRS_{post-therapy} (3,77 \pm 0,87)$ was lower and $NRS_{post-therapy} - NRS_{initial}$ differences ($4,5 \pm 1,1$) was higher than medically treated patients ($NRS_{initial}: 7,7 \pm 1,2$, $NRS_{post-therapy}: 4,2 \pm 1,2$, $NRS_{post-therapy} - NRS_{initial}$ differences: $3,5 \pm 1,4$; $p=0,025$, $p=0,024$, $p<0.001$, respectively).

Conclusion: The aetiology of pain in lung cancer may vary between a great range of origin. Combination therapies with proper regional and medical techniques would optimize the pain outcomes and in suitable patients would be the primary choice of pain palliation.

AN ALTERNATIVE MANAGEMENT APPROACH FOR POST-STERNOMY NEURALGIA: TRIGGER POINT INJECTION AND INTRAVENOUS LIDOCAINE INFUSION

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Background and aim: The incidence of post-sternotomy neuralgia (PSN) is 21-56% following cardiac surgery. The patients with PSN usually refer to pain clinics with continuous, stabbing and burning-like pain. The current therapies include nerve blocks, trigger point injections and neuropathic pain medications. However, the management should be individualized for each patient. Here, we report the management of PSN in two patients under anticoagulant therapy.

Case 1: 67-yrs, male patient with burning, throbbing-like pain at both sides of sternum, spreading to both arms and increasing at night. Verbal analogue score for pain (VAS) was 7. He had coronary artery-bypass-grafting surgery 4-months ago and anticoagulant and antiplatelet therapy due to previous cerebrovascular event.

Case 2: 46-yrs, male patient with severe, burning and stabbing-like pain at right side of sternum, spreading to his right arm. VAS was 9. He was under anticoagulant therapy due to mitral valve replacement 3-months ago.

The patients were reconsulted with cardiology department to rule out an angina episode or post-cardiotomy syndrome. Any central nerve blockade wasn't considered due to anticoagulant use. The most painful points were determined in patients. Both patients received trigger point injections with lidocaine 1% and intravenous infusion of lidocaine 100 mg in 100 mL saline. This treatment was repeated for 3-times with 1-week duration. VAS remained between 0-2 following 4th treatment in patients.

Conclusion: We suggest that the patients with PSN and concomitant anticoagulant therapy can be managed effectively by trigger point injections and intravenous infusion of lidocaine due to lidocaine's membrane-stabilizing and central and peripheral sensitization-modulating effect.

EFIC5-0800

Pain treatment (invasive): Nerve blocks, indwelling catheters

ADAPTING THE WHO SURGICAL SAFETY CHECK LIST TO INTERVENTIONAL PAIN MEDICINE

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Background and Aims:

Repeated mishaps on interventional lists.

Root causes were human, not technical factors.

Examples:

Nerve block – wrong side. Mistake noticed, block repeated correct side. Staff missed error, patient had noticed wrong side, but not said anything.

Facet joint block, needle placed with some difficulty. Patient confirmed it was in right spot.

Physician forgot to inject and removed needle.

Nurse noticed mistake, did not dare to tell in presence of awake patient.

Methods:

We adapted the WHO surgical check list:

Team Brief:

Before start of treatment list

Team (physician, nurses, auxiliaries, radiographer) assembles.

New members introduced to team.

Review of planned procedures

Issues and problems, equipment required ...

Then send for patients

Time Out:

- Patient on treatment table
- Check of patient identity, allergy status,
- Intended procedure, left/right?

Debrief:

- End of list,
- What went well ?
- Do anything differently?

Results:

Introducing new procedures, breaking down traditional barriers, reducing authority distance, is culturally challenging in Yorkshire.

Since introduction, ZERO laterality errors.

Junior staff speak up:

Auxiliary sees physician accidentally contaminating sterile glove.

She speaks up. Consultant: "Thank you. Fresh gloves, please"

This may prevent a paraspinal abscess.

Debriefing did not work, people recover patients, go home, start clinics ...

Staff members feel positive about these changes, more valued.

Introduction of the WHO checklist:

- cost-neutral,
- reduced mishaps/complaints
- increased efficiency of lists.

Conclusions

An adapted WHO check list reduced non-technical error and increased staff satisfaction.

EFIC5-0820

Pain treatment (invasive): Nerve blocks, indwelling catheters

CHRONIC PAIN AFTER SURGICAL INGUINAL HERNIA REPAIR

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Objectives: The incidence of chronic pain after inguinal hernia has been estimated to be between 1% and 19%.^{1,2,3} The exact cause of the post-herniorrhaphic pain is not clear.

Methods: A 21 year, man was referred to the chronic pain service with a 5 month history of pain in the left inguinal region. He had undergone an open surgical intervention of the hernia repair with mesh. After two weeks pain was released and patient was discharged home without complications. The pain restarted after he lifted a heavy weight. It involved the lower abdomen, more markedly the left lower quadrant, inguinal region. Treatment of the patient included Lyrica, Diclofenac, Nexium, Neurobion, Novalgine drops, but the benefit was very little, his analogue pain rating scale remained 7–8. Patient was referred for investigation and treatment, and the chronic pain service was consulted.

Results: A diagnostic and therapeutic ultrasound guided nerve block was indicated. Left side ilioinguinal block under ultrasound is performed using 5 mL of 0.25% bupivacaine and 16 mg of methylprednisolone to block the ilioinguinal nerve and tender areas in the scar. Patient underwent a session of 4 blockades but no significant benefit from the other blockades. Fifty UI Botox in the Locus dolendi is administered. Two days after, patient referred that he had no benefit from this, so patient is advised for surgical treatment.

Conclusion: Chronic severe pain following inguinal hernia repair is a significant problem. Treatment options vary depending upon the nature of the pain and the physical findings.

COMPARISON OF BLOOD METHEMOGLOBIN LEVELS IN THE PATIENTS WHO HAD UPPER EXTREMITY OPERATION WITH REGIONAL BLOCK

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Background and aims: RIVA and axillary block are the commonly used regional anesthesia techniques in upper extremity surgery. Local anesthetic drugs which are used in these techniques may cause methemoglobinemia. In this research, our targets are the noninvasively measurement of blood methemoglobin levels by using pulse co-oximeter (Radical 7 Masimo, USA) in patients who had upper extremity surgery with RIVA and axillary block, early diagnosis of methemoglobinemia which is based on usage of local anesthetic drug and preventing the complications of this situation.

Materials and Method: This research is done on 48 patients which are ASA group I-III and 18-70 years old had hand, wrist, forearm surgery by using axillary block or RIVA. RIVA was applied in forearm, hand, wrist operations which have durations below the 60-90 minutes. Axillary block was performed to the elbow, forearm, wrist and hand surgeries which had more operation time (8-12 hours). Axillary block with neurostimulation technic was performed to the group I (n=24) by administrating prilocaine %2 (5 mg/kg). RIVA was performed to the group II (n=24) by administrating prilocaine %2 (3 mg/kg). Heart rate, electrocardiography, noninvasive systolic blood pressure, diastolic blood pressure, mean arterial pressure and peripheral oxygen saturation values were watched by using the anesthesia monitor before and during the surgery. Also, basal methemoglobin values were measured with pulse co-oximeter in all patients.

Results: The mean of methemoglobin level on group I was 1.77%, the mean of methemoglobin levels on group II was 4.43%.

Conclusion: Methemoglobin level was higher in patients who had axillary block.

EFIC5-0898

Pain treatment (invasive): Nerve blocks, indwelling catheters

EFFICIENCY OF CAUDAL EPIDURAL NEUROPLASTY ADHESIOLYSIS TREATMENT OF CHRONIC LOW BACK PAIN FOR FAILED BACK SURGERY SYNDROME

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Background and aim: Epidural neuroplasty is one of the minimally invasive techniques for adhesiolysis in patients who have already failed conservative treatment for chronic low back pain.

Methods: In this retrospective study, we aimed to evaluate caudal epidural neuroplasty-adhesiolysis efficiency in patients with chronic low back and/or lower extremity pain due to failed back surgery syndrome. The records of the 75 patients (29 male, 46 female) who underwent caudal epidural neuroplasty-adhesiolysis between January 2008 and May 2013 were examined retrospectively. Visual Analogue Scale (VAS) for pain before and one week, one month and three months after the procedure and the type of administered neuraxial steroid types were evaluated.

Results: VAS scores were found to be significantly improved compared with the preoperative values. The VAS scores at the 1st week, 1st and 3rd months were found to be significantly decreased compared to baseline scores ($p < 0.001$).

Discussion: We concluded that caudal epidural neuroplasty-adhesiolysis is an effective treatment for chronic low back pain and/or lower extremity in failed back surgery syndrome. But its effectiveness was decreased in long term.

Table: VAS scores after procedure

			VAS (0-10)		
	Before procedure	1 week	1. month	3. month	6. month
Median	6	1*	2*	2*	4
Minimum	4	0*	0*	1*	3
Maksimum	9	6	6	7	8

* $p < 0,001$, compared with baseline (before procedure) VAS

EFIC5-0926

Pain treatment (invasive): Nerve blocks, indwelling catheters

COMPARISON OF CONTRAST FLOW AND CLINICAL EFFECTIVENESS BETWEEN A MODIFIED PARAMEDIAN INTERLAMINAR APPROACH AND TRANSFORAMINAL APPROACH IN CERVICAL EPIDURAL STEROID INJECTION

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Background: The different methods of cervical epidural steroid injection (CESI) include the median or paramedian interlaminar (PI) approach and the transforaminal (TF) approach. We hypothesized that the modifiedPI (mPI) approach could deliver drugs effectively and safely into the anterior epidural space, compared with the TF approach.

Methods: A total of 62 patients were randomized into either the mPI group (n = 31) or the TFgroup (n = 31). Contrast to the anterior epidural space (primary outcome), vascular uptake, and discomfort were assessed.

Furthermore, pain intensity in the arm and neck (numeric rating scale, NRS), and the degree of symptom change (5-point Likert scale) before the procedure and 2 weeks, 1 and 3 months following the procedure were compared between the two groups. Effectiveness was defined as a $\geq 50\%$ reduction on the NRS for arm and neck pain, and a result of 3 or 4 on the Likert scale at 3 months following the procedure.

Results: Contrast to the anterior epidural space in the mPI group was significantly greater than that in the TF group ($P = 0.036$). Vascular uptake and discomfort in the mPI group were significantly lower than those in the TF group ($P < 0.001$). Of the patients in whom the procedure was effective, 24 (77.4%) were from the mPI group and 20 (64.5%) were from the TF group ($P = 0.263$).

Conclusion: It suggests that the mPI approach allows for effective and safe delivery of drugs into the anterior epidural space.

EFIC5-0968

Pain treatment (invasive): Nerve blocks, indwelling catheters

PREDICTIVE IMPACT OF DEMOGRAPHICS AND PSYCHOMETRIC TESTING ON TREATMENT CHOICE

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Background and Aims

Pain is an emotionally charged perception associated with long-term mood and behavioural changes. The role of pain clinics is to provide a multidisciplinary approach with a noticeable shift in recent years from procedure-based interventions to cognitive therapies.

Methods

A practice survey was conducted for a month. There was no deviation from normal practice. The data was stratified on demographics, pathology, and duration of symptoms, psychometric testing and treatment choice. Clinician bias on treatment choice was analysed.

Results

121 new patients were seen. 9 did not return the psychometric questionnaires and were analysed separately. Most presented with pain of over 3 years duration. Patients with spinal pain (44%) were more likely to be offered procedural interventions even if severely depressed and anxious. Patients with widespread symptoms had pain for longer, tried more medications and were more likely to be offered educational programmes and complementary therapies. A worrying trend of opioid use was noted with more than 25% of patients on strong opioid drugs at the point of referral.

Conclusion

Most patients were offered a holistic approach including multiple therapies aimed at promoting self-management and functional improvement. Patients with a shorter duration of symptoms and low levels of distress were more likely to have focal pathology and be offered procedural interventions. Patients with widespread pain, long standing symptoms, poor quality of life scores and evidence of severe depression and anxiety and personality disorder traits as well as high opioid users were excluded from injection based therapy.

EFIC5-0969

Pain treatment (invasive): Nerve blocks, indwelling catheters

SUPRASCAPULAR NERVE BLOCK IN CHRONIC SHOULDER PAIN

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Background and aims: This is a retrospective study to assess the effectiveness of suprascapular nerve block to relieve pain and improve the range of movement in degenerative disease of shoulder.

Methods: We studied 755 adults, 253 men and 502 women aged from 40 to 85 years old with chronic shoulder pain. The patients were in pain and had junctional disability due to degenerative disease. We performed suprascapular nerve block with 10 ml of levobupivacaine 2.5 mg/ml using anatomical landmarks and a nerve stimulator to determine needle placement or an ultrasound technique if it was difficult to identify the nerve. Thirty minutes later the patients had a physiotherapy session. They were given instructions to do specific exercise for as long as the block lasted. A series of 4 suprascapular nerve blocks were performed to the patients. We recorded pain scores and range of movement. The follow up was 12 weeks.

Results: The success rate of the block was 99.5 %. There was significant improvement in all pain scores (pain at rest, at night and at movement) 90% in all patients. Pain VAS score was 2-3 occasionally, during the follow up. The range of movement improved 80-90% in all patients. There were no significant adverse effects in the patients due to the peripheral nerve block.

Conclusion: Suprascapular nerve block is an easy and safe method to perform with minimum side effects and very effective in the management of chronic shoulder pain, which is a common clinical problem.

EFIC5-0983

Pain treatment (invasive): Nerve blocks, indwelling catheters

EPIDUROSCOPY IN PATIENTS WITH FAILED BACK SURGERY SYNDROME

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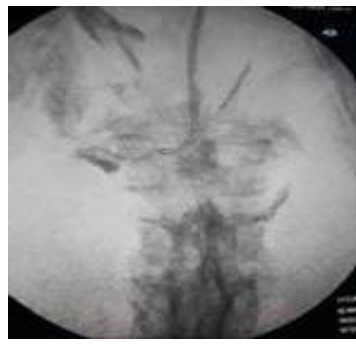
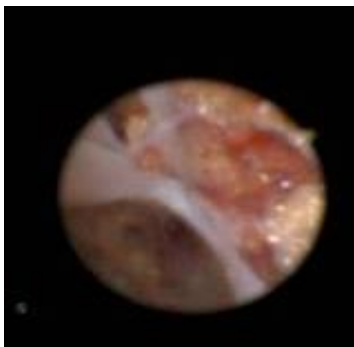
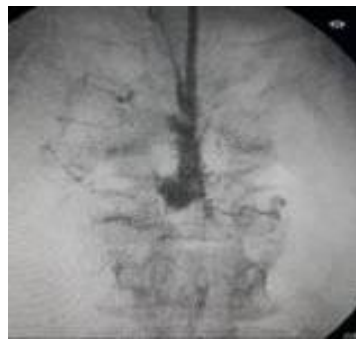
Background: Failed Back Surgery Syndrome (FBSS) is a major clinical problem, which is defined as persistent or recurrent pain, mainly in the region of the lower back and leg, even after successful spine surgeries. Epiduroscopy aids in identifying painful structures in the epidural space, establishing a diagnosis and administering drug therapies. This endoscopic technique may play a role in the management of FBSS.

Objective: The aim of this study is to assess the effect of Epiduroscopy for chronic pain related to failed back surgery syndrome.

Method: The investigators studied 79 patients of both sexes (60.75% female and 39.25% male), between 21 and 85 years old (the mean age = 52.65), with persistent chronic back pain after lumbar spine surgery for more than 6 months. Epiduroscopy was performed via a caudal canal approach through a 14G epidural needle inserted through the sacral hiatus by local anesthesia and sedation under fluoroscopy. The patients were evaluated within 3 and 6 months after intervention. Treatment success was defined as 50% or more pain relief maintained during months of follow-up.

Results: Of 79 patients enrolled, 31 patients (39.24 %) achieved fifty percent or more pain relief which was considered as treatment success. Eighteen patients (22.78%) showed between twenty to fifty percent improvement, and 30 patients (37.97%) did not show any improvement.

Conclusion: Epiduroscopy seems to be an effective procedure in patients with Failed Back Surgery Syndrome, although it can be considered as a step before the Spinal Cord Stimulation (SCS).



EFIC5-0999

Pain treatment (invasive): Nerve blocks, indwelling catheters

COMBINATION OF TRIGGER POINT INJECTION APPLIED TO THE MID AND UPPER TRAPEZIUS AND SHOULDER INJECTION IN THE MANAGEMENT OF EXACERBATION OF SHOULDER PAIN

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Background and Aims: Shoulder pain can be a result of injury or disease of shoulder joint. The design of shoulder joint is such that it sacrifices stability for mobility. As an extremely mobile joint that plays a central role in the action of a major extremity, shoulder is at risk for injury. The study aims to evaluate the effectiveness of using the combination of trigger point injection applied to mid and upper trapezius and shoulder injection in the management of exacerbation of shoulder pain.

Methods: 60 patients were evaluated in Pain Center, International Medical Center, KSA. They all have received a combination of trigger point injection, applied to mid and upper trapezius, and shoulder injection, under fluoroscopy. After doing MRI or US Shoulder and excluding significant event, findings included impingement syndrome, partial tears and other relevant inflammatory exacerbation. Inclusive criteria: 26 females, 34 males; ages 36-76 years and mean of 56. Exclusive criteria: pregnant women, children, anyone who is allergic to any of the medication ingredients, history of low blood pressure, patients who has liver or kidney disease or significant cardiac and respiratory depression.

Results: Average improvement of about 70% was appreciated, as per numeric pain scale, within 7 days and sustained for at least 6 months or more after an average of 6 sessions of PT.

Conclusion: The combination of trigger point injection applied to mid and upper trapezius and shoulder injection in the management of exacerbation of shoulder pain provide significant pain relief and help accelerate healing process.

EFIC5-1014

Pain treatment (invasive): Nerve blocks, indwelling catheters

ULTRASOUND GUIDED GENICULAR NERVE BLOCK

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Background and aims:

Chronic knee pain can be a difficult condition to treat. The commonest aetiology for knee pain is osteoarthritis, which is frequently treated surgically with knee replacement. Alternatives such as Genicular nerve blocks have been used in refractory conditions or where surgery is not feasible.

The traditional method is based on fluoroscopy guidance. We describe the same procedure with the use of point of care ultrasound to guide needle placement for nerve blocks or radiofrequency treatments.

Methods:

The knee joint is innervated by the articular branches of various nerves, including the femoral, common peroneal, saphenous, tibial and obturator nerves. These articular branches around the knee joint are known as Genicular nerves and are pure sensory nerves. They run alongside small arteries near the joint capsule and at the junction of shaft and epicondyles of femur and tibia. These nerves are identified with ultrasound and either blocked or ablated.

Results:

Although Genicular nerves are the main innervating articular branches for the knee joint, other articular branches may also be present. For this reason, pain of the knee joint may not be completely relieved. We have performed a series of ultrasound guided procedures with satisfactory results so far.

Conclusions:

Ultrasound can be used to visualise the Genicular nerves in order to perform diagnostic blocks and radiofrequency treatments. The advantages are no exposure to radiation and there may be added accuracy in delivering the treatment hence increased success rate.

EFIC5-1078

Pain treatment (invasive): Nerve blocks, indwelling catheters

RESULTS OF CAUDAL EPIDURAL STEROID INJECTIONS(CESI): RETROSPECTIVE ANALYSIS

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Objective of this study was to obtain and review the effectiveness of clarification of CESI we made.

Materials and Methods:

We analysed the results of 168 CESI: 93 patients, 30 men and 63 women, 16 to 87 years. The cause for procedures was radicular pain (55), spinal stenosis (32) and pelvic pain (6). Spinal disc extrusion confirmed by MRI and pain, giving no results to medication, was indication for CESI.

All patients were injected 20 ml 0.125% Bupivacain with Triamcinolone.

"Diagnostic" CEI was performed only with Bupivacain (27). Positive results (25) - no pain within 8-12 hours with the subsequent reduction in pain intensity during at least one day. Negative result (2): pain reappeared after 1.5 hours (1); pain was stronger (1). Both patients had a concomitant diagnosis of fibromyalgia. CESI was not done for these patients.

In 36 patients CESI performed again from 2 to 10 times at intervals of average - 5.5 months. The maximum duration of a positive effect - 19 months.

In 6 patients the pain came back at the same level after 8-12 hours. Three with radicular pain underwent surgery shortly after CESI: the size of the disc sequestration is far greater than could be expected on the basis of MRI. Three with spinal stenosis

Side effects and complications we have not seen.

Conclusion

1. CESI with careful selection of patients is effective and safe method of treatment.
2. Lack of therapeutic effect may be considered as a further argument in favour of surgical treatment

EFIC5-0056

Ethics, education, history, law: History and philosophy of pain

**HOLISTIC RESTORATION OF TOTAL PAIN - THE IMPORTANCE OF REMEMBERING
SANCTITY OF LIFE AND PRAYER**

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The human consists of body, mind and soul. Total pain involves physical, mental, social and spiritual aspects (Saunders). Social means relations with others and spiritual means relations with the Absolute. Human soul exists in the core of the man and the four elements of pain are not separated but combined and integrated. In Moses' Ten Commandments, "Don't murder", and in the five commandments of Buddhism, "Don't kill any life." We should respect the personality of every patient. I have recommended remembering the sanctity of life, which may lead to the holistic restoration. Holistic respect and prayer for pain patients plays an important role in medical management. We often experience our patients' recovery from critical state when the patient is regarded as a precious person who has sanctity of life and when the tender hearted medical staff recognized their pain as total pain. I presume that all kinds of pain is also total pain. It is described in Christian theology, that the Creation, the Fall and the Atonement represent the human state of spirituality. Reconciliation of pain patients with other persons or God may lead to social restoration or spiritual restoration of pain. The resolution of individual problems of sin and compassionate respect of sanctity of life may result in holistic restoration for all pain patients. Angel said to Mary, "Do not be afraid.--For with God nothing shall be impossible"(KJV Luke1:37) Calling the name of patients is important for holistic restoration. I report holistic restoration of total pain.

EFIC5-0078

Pain treatment (invasive): Radiofrequency blocks

INTRAARTICULAR PULSED RADIOFREQUENCY TREATMENT FOR KNEE JOINT PAIN IN ELDERLY PATIENTS WITH OSTEOARTHRITIS

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Background and aims : The purpose of this study was to retrospectively investigate the effectiveness of intraarticular pulse radiofrequency (IPRF) treatment for osteoarthritic knee joint pain in elderly patients.

Methods: IPRF was applied to knee joint for 15min at 2Hz with a pulse width of 10ms and 65V under flouroscopy. Visual analog scale(VAS) pain scores, Womac total scores, medication usage (same-decreased-discontinued), and quality of life (same-improved-much improved) were evaluated before and, 4 weeks, 3 and 6 months after the treatment. After 6 months, patients satisfaction levels were determined.

Results: A Significant decrease in mean VAS scores from baseline was observed in all follow-up periods, as follows: 7.4 ± 1.3 to 2.2 ± 1.0 , 1.5 ± 1.0 , and 2.0 ± 1.1 respectively ($p < 0.001$, $p < 0.00$, $p < 0.001$). All the patients showed a significant improvement of WOMAC total scores at 4 weeks, 3 and 6 months ($p < 0.001$, $p < 0.001$, $p < 0.001$,). 4 weeks, 3 and 6 months after the treatment, patients quality of life rates were as follows for “much improved” 78.0%, 81.0%, 81.0%, for “improved” 9.5%, 16.7%, 14.3%, and for “same” 11.9%, 2.4%, 4.8% respectively. Patient satisfaction was very high (97.6%). No serious adverse effects or complications were encountered.

Conclusions: Intraarticular PRF appears to be an effective, safe and minimally invasive intervention treatment with lower complication rate for knee joint pain in elderly patients with osteoarthritis. Randomised, prospectively, controlled studies should be carried out to confirm these results. It should be tried after conservative treatment has failed.

EFIC5-0177

Pain treatment (invasive): Radiofrequency blocks

**SEARCHING OF SPECIFICITY AND SELECTIVITY BY RADIOFREQUENCY
THERMORHIZOTOMY IN TRIGEMINAL NEURALGIA**

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Aims. Gasserian ganglion percutaneous techniques for trigeminal neuralgia are all destructive including the radiofrequency thermorhizotomy (RT) that produces more or less selective lesions by monitoring the tip of electrode for temperature and by identifying the exact position of needle point for specific division. We are evaluating side and long-term effects in a small series of consecutive patients treated with a "mild" thermolesion.

Methods. Fifteen patients (5 for 3th branch, 4 for 2th, 4 for 2-3th, 2 for 1th) are periodically in treatment with RT. To obtain the lesions through a transovale foramen approach under fluoroscopy we are combining the verbal response of patient to position of needle point to identify the specificity of division of trigeminal nerve with recorded voltage of stimulation (often < 0,2 V) to identify a minimum distance from it. The search to limit sensory loss is obtained adjusting the temperature of first lesion under 60° C and repeating it a second or a third once with gradual increases of temperature evaluating result to touch in awaked patient after each one.

Results. We have executed after 2 years 23 RT with a sensory loss and corneal numbness for one patient and a minor hypoesthesia in another one. Long-term effects on pain relief are in the 8-23 months range. We haven't had motor lesions.

Conclusions. Good response was always achieved after retreatment with RT in recurrent patients with no major or minor side effects. Patients to the question prefer repeating the treatment but to have not the sensory loss.

EFIC5-0178

Pain treatment (invasive): Radiofrequency blocks

INTRADISCAL PLUS DORSAL RADICULAR GANGLIA'S PULSED RADIOFREQUENCY AND INTRAFORAMINAL STEROID INJECTION FOR LUMBAR RADICULOPATHIES

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Aims. Intradiscal Pulsed RadioFrequency (I-PRF), Dorsal Radicular Ganglia PRF (DRG-PRF) or Intraforaminal Steroid Injection (ISI) each alone are therapy for low back and leg pain. No evaluations exist for the integrated treatments to cure lumbar radiculopathies. Our purpose is to value a clinical usefulness of combining together I-PRF, DRG-PRF and ISI and their long time effects in a consecutive series of lumbar radiculopathies.

Methods. 132 consecutive adult patients with lumbar radiculopathies were evaluated. For one or more vertebral levels we combined ISI and DRG-PRF (3 cycles for 120 sec at 42 °C) following each equivalent

I-PRF treatment (900-1200 sec at 42 °C). The primary outcome collected measures were a numeric rating scale (NRS) for pain, the Oswestry Disability Index (ODI) and Roland-Morris Disability Questionnaire (RMDQ) for disability. The secondary outcome measures were reduction of analgesic consumption and physical therapy, patient's satisfaction to treatment. Clinical assessments of these measures were performed at 1, 3, 6 and 12 months. Attention was made for age, levels of treatment and severity of pathology.

Results. Pain, ODI and RMDQ scores were significantly decreased when compared with the baseline values and with significant changes in all secondary measures at all points of follow-up. Minor results but also liked were detected with older age, multiple levels of treatment and with advanced grade of discopathy. No complications were recorded.

Conclusions. These integrated treatments could be apparently a less invasive and more efficacious procedure in reducing pain scores, improving functional outcome and postpone surgery needs.

PAIN AND SENSORY DISTURBANCES IN POSTMASTECTOMY PAIN BEFORE AND AFTER PULSED RADIOFREQUENCY

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Background and aims

Up to 50% of the women undergoing breast surgery for cancer develop chronic postmastectomy pain (PMPS) ¹. PMPS is a neuropathic pain syndrome caused by damage of intercostal nerves during surgery.

Pulsed radiofrequency treatment (PRF) may be effective in relieving PMPS ^{2,3}.

This study aims to identify the effects of PRF on pain intensity and sensory nerve function by means of quantitative sensory testing (QST).

Methods

QST measurements were performed in 39 patients with clinically diagnosed PMPS and interpreted according to the DFNS protocol ^{4,5}. Mean age was 54 y (32-79), duration of pain 54 m (6-276). In 24 patients, who had undergone paravertebral PRF of one (n=16) or two (n=8) intercostal nerves (ICN) the sensory disturbances before and 3-6 w after PRF were compared.

Results

Preinterventional QST revealed thermal and tactile detection thresholds 2-3 SD above reference values of the trunk ⁵ and patients' own contralateral mirror image test site ($p<0.0001$), cutaneous pain thresholds were less affected (<1 SD, $p<0.05$). Deep tissue pain sensitivity and pain summation were increased (>2 SD, $p<0.0001/1.5$ SD, $p<0.005$) and 9/39 patients exhibited dynamic mechanical allodynia.

After PRF average pain intensity reduced significantly by approximately 50% ($p<0.05$) from NRS 3.5 (0-9) to 1.8 (0-5). The extent of thermal and mechanical sensory loss decreased marginally, nociceptive sensitization disappeared in 6 patients, and pain summation returned to normal reference values.

Conclusions

Paravertebral PRF treatment of ICN decreased the intensity of PMPS and nociceptive sensitization while the extent of sensory impairment changed only marginally.

EFIC5-0270

Pain treatment (invasive): Radiofrequency blocks

INTRADISCAL ELECTROTHERMAL THERAPY (IDET) IN THE PATIENTS WITH LUMBAR DISC HERNIATION

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Objectives

In our study it was aimed to evaluate the efficacy of Intradiscal Electrothermal Therapy (IDET) in the patients with lumbar disc herniation in our department of algology.

Methods

In this retrospective study, 280 lumbar disc hernia patients that were treated using IDET in year 2013-2014 were included. The patients that had and extrude intervertebral disc or operated after IDET therapy were excluded from the study. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy, sensory loss, complications and satisfaction scores after the therapy were recorded.

Results

Data of 280 patients were analyzed and found 106 (37.8%) patients were male, 174 (62.1 %) patients were female. Mean age of the patients was found to be 49.70 ± 14.74 . Mean VAS score before the therapy was 8.38 ± 1.17 , 2 month after the therapy it was significantly decreased to 2.65 ± 2.67 . Data of movement scores were found higher after the therapy than the scores before therapy. When the satisfaction data were analyzed it was found 246 (90.3%) patients were satisfied and 34 (9.7%) patients were unsatisfied. Patients had no complications.

Conclusion

IDET is a recent method in the management of lumbar disc herniation and becoming common in our region. In conclusion IDET in the patients with lumbar disc herniation is an effective and minimally invasive treatment method and we suggest that it should be used more commonly.

OUR SIX YEAR EXPERIENCE OF RADIOFREQUENCY THERAPY IN THE PATIENTS WITH LUMBAR FACET SYNDROME

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Objectives

In our study it was aimed to evaluate the efficacy of radiofrequency therapy (RFT) in the patients with lumbar facet syndrome in our department of algology.

Methods

In this study, 543 lumbar facet syndrome patients that were treated using RFT in 2008-2014 were included. The patients that had no diagnosis of facet syndrome and operated after RFT were excluded from the study. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy and satisfaction scores after the therapy.

Results

Data of 543 patients were analyzed and found 210 (38.6%) were male , 333 (61.4 %) were female. Mean age of the patients was found to be 51.86 ± 13.76 . Mean VAS score before the therapy was 8.03 ± 1.06 , 1 month after the therapy it was significantly reduced to 4.18 ± 1.64 and 6 months after the therapy it was found as 4.08 ± 2.26 . When the satisfaction data were analyzed it was found 476 (87.6%) patients were satisfied and 67 (12.3%) patients were unsatisfied. Data of movement scores were found higher after the therapy than the scores of pre therapy. Patients had no complications.

Conclusion

RFT is becoming a common method in the management of lumbar facet syndrome in our region and we wanted to evaluate our results. In conclusion radiofrequency therapy in the patients with lumbar facet syndrome is an effective and safe treatment method, and should be used more commonly.

THE EVALUATION OF RADIOFREQUENCY THERAPY IN THE PATIENTS WITH CERVICAL RADICULAR PAIN: OUR EXPERIENCES

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Objectives

In our retrospective study it was aimed to evaluate the efficacy of radiofrequency therapy (RFT) in the patients with cervical radicular pain in our clinic.

Methods

In this study, 128 patients with cervical radicular pain that were treated using pulsed RFT in 2009-2014 were included. The patients that were operated after RFT were excluded from the study. All data were obtained from the pain evaluation cards in the patient files and recorded. Data of age, sex, visual analog scale (VAS) scores before and after the therapy, complications and satisfaction scores after the therapy were recorded.

Results

It was found 44 (34,3%) patients were male , 84 (65.7 %) patients were female. Mean age was found to be 52.91 ± 11.22 . Mean VAS score before the therapy was 8.00 ± 1.16 , 1 month after the therapy it was significantly reduced to 4.56 ± 1.45 and 6 months after the therapy it was found as 4.34 ± 2.94 . When the satisfaction data were analyzed it was found 100 (78,1%) patients were satisfied and 28 (21,9%) patients were unsatisfied. Data of movement scores were found higher after the therapy than the scores of pre therapy. Patients had no complications.

Conclusion

Radiofrequency therapy is an effective method in the management of cervical radicular pain. As it has been used for 4 years in our department, we wanted to evaluate our results. In conclusion RFT in the patients with cervical radicular pain is an effective and safe treatment method, and should be used more commonly.

EFIC5-0285

Pain treatment (invasive): Radiofrequency blocks

**PREDICTIVE FACTORS ASSOCIATED WITH SUCCESS AND FAILURE FOR
RADIOFREQUENCY THERMOCOAGULATION IN PATIENTS WITH TRIGEMINAL
NEURALGIA**

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Background and aims: Careful selection of patients for managing trigeminal neuralgia (TN) with radiofrequency thermocoagulation (RFT) can decrease morbidity and improve treatment efficacy. The goal of this study was to determine clinical variables related to the treatment outcome in patients with TN undergoing RFT.

Methods: Clinical data were garnered from Seoul national university hospital who underwent RFT for trigeminal neuralgia during 2004-2013. Success was defined as > 50% pain relief lasting at least 6 months. Factors retrospectively evaluated for their association with outcome included demographic variables, etiology, baseline NRS pain score, pain characteristics, pain location, duration of pain, previous interventions, co-morbid medical condition, co-morbid psychiatric condition.

Results: Among 102 patients who underwent RFT for managing TN, 79 patients (77.5%) reported a successful outcome (> 50% pain relief at 6 months after RFT procedure). Pain characteristics was the most significant predictor associated with the successful outcome of RFT in both univariate and multivariate logistic analysis; Odds ratio of provoked paroxysmal pain was 80.1 and mixed type of pain 34.4. Co-morbid psychiatric condition and injury etiology were suggested as negative predictors related to the outcome of RFT in univariate analysis; however, they were not statistically significant in the multivariate analysis.

Conclusions: Pain doctors should consider these findings when selecting patients for managing TN to increase the efficacy of RFT.

EFIC5-0525

Pain treatment (invasive): Radiofrequency blocks

THE ROLE OF FACET JOINT INJECTION FOR LIKELY FACETOGENIC LUMBER BACK PAIN FOLLOWING NEGATIVE MEDIAL NERVE BRANCH BLOCK

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Background and Aims

Low back pain caused by lumbar facet joints is a common cause of back pain with prevalence varying from 5 % to 90%. A patient's history and clinical examination can aid diagnosis is not perfect. The use of diagnostic medial nerve branch blocks (MNBB) provides a logical assessment of the degree of facet joint pain. If a patient receives pain relief greater than 50%, they would go on for radiofrequency ablation. The role of facet joint injections (FJI) remains controversial. In patients with negative MNBB, radiofrequency ablation is not appropriate but in these cases is there a role for facet joint injections and what pain relief do these patients achieve.

Method

All patients at Wrexham Maelor hospital who underwent diagnostic medial nerve branch blocks were identified using theatre list manager (n=15). Their case notes were then reviewed and ascertained if the block was successful or not, and what treatment they went on to receive.

Results

15 identified patients underwent diagnostic MNBB with 8 positive results (2 lost to follow up). 8 subsequently received radio frequency ablation with 5 positive PAS scores. 5 went on to receive facet joint injection with these results with no positive results (3 lost to follow up).

Conclusion

Radiofrequency ablation provided 5 of 8 patients a positive PAS score. From the small number of SIJ injections none received benefit. Results from the last year are soon to be looked at to allow the role of SIJ to be looked at closer.

THE EFFECT OF RADIOFREQUENCY THERMOCOAGULATION ON GENICULAR NERVES (GSRFT) APPLICATION ON KNEE OSTEOARTHRITIS PAIN AND LOSS OF FUNCTION

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Introduction: Knee osteoarthritis (OA) is a very common musculoskeletal system problem which leads to pain and loss of function especially in the elderly population all over the world.

Radiofrequency Thermocoagulation on genicular nerves in knee (GSRFT) is one of the alternative methods of treatment defined in recent years. We aimed to investigate the effect of GSRFT application on knee OA pain and loss of function.

Method: 40 patients with knee OA pain that has continued for at least 3 months and has not responded to conservative treatments were included in the study. GSRFT was applied to all patients under fluoroscopy. Visual analog scale (VAS) scores and the Western Ontario McMasters OA Index (WOMAC) were applied to patients before the procedure, and 1 month and 3 months after the procedure.

Results: A statistically significant decrease was observed in the patients' VAS scored in the 1st and 3rd months after GSRFT application (<0.001). In addition to this, in the 3rd month, more than half of the patients had VAS scores of 4 and above. Decrease in WOMAC pain, imprisonment and function sub-group scores, and WOMAC total score in the first and third months was statistically significant (<0.001). None of the patients show any side effects.

Conclusion: As a result of our study, GSRF application is an effective, minimally invasive method for the treatment of chronic knee OA pain and loss of function. However, this finding should be supported by longer term studies conducted in controlled, randomized and larger groups.

HYPNOSIS IN THE TREATMENT OF SEVERE CHRONIC POST-TRAUMATIC HEADACHE: TWO CASES REPORTA. Castel¹, A. Padrol¹, J. Ramos¹, J. Recasens¹, R. Perriñán¹, S. Boada¹¹*Pain Clinic, Hospital Universitari de Tarragona Joan XXIII, Tarragona, Spain*

BACKGROUND AND AIMS: Psychological treatments are effective in improving chronic pain. However, the psychological treatment of chronic post-traumatic headache (CPH) still remains a considerable challenge. The aim of this work is to demonstrate how hypnosis can be helpful in decrease pain symptoms.

METHODS:

Patient 1: Man, 41 years old. September, 2011: frontal and orbital fracture. **Sequelae:** attention and concentration impairment, psychomotor retardation, low tolerance to noise and crowded spaces, memory deficits, sensation of instability, difficulties in visual-perceptual complex integration, altered categorization, bilateral hipoacusis, and chronic headache. **Specific difficulties:** deficit in memory and attention, high fatigue in attention tasks, increased headache with effort. **Hypnosis adjustment protocol:** session length less 10 minutes,

Patient 2: Man, 48 years old. December, 2012: frontal cranium fracture and acute subdural hematoma in right fronto temporo parietal. **Sequelae:** anterograde memory deficit, sensation of instability, difficulties in visual-perceptual complex integration, and chronic headache. **Specific difficulties:** deficit in memory, allodynia in occipital. **Hypnosis adjustment protocol:** no head support on occipital.

Treatment: 5 sessions of analgesic hypnosis with suggestions of a fresh head and forehead adapted to specific conditions of each patient

RESULTS:

Patient 1. Sessions	1	2	3	4	5
Pain intensity before	8.2	7.8	8.6	7.5	8.0
Pain intensity after	8.3	2.1	2.3	1.2	0
Improvement percentage	0%	73%	73%	84%	100%
Patient 2. Sessions	1	2	3	4	5
Pain intensity before	7.0	8.1	4.6	8.0	3.0
Pain intensity after	6.8	6.5	0	0	0
Improvement percentage	3%	19%	100%	100%	100%

CONCLUSIONS: 1) These cases illustrate how the analgesic hypnosis can improve pain intensity in severe CPH patients. 2) The development of the hypnosis session should be adapted to the patient's specific conditions.

EXPRESS OF PAIN IN BORDERLINE PERSONALITY DISORDER. DEFENSE MECHANISMS AND DECOMPENSATION

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Motivation of topic: Pain, in psychological or physical sense, with suicidal particularities of depressive episodes, presents a very well known image in the psychiatric and psychological literature of bipolar patients with borderline personality disorder. The present case is evidence through paranoiac decompensation and by **pain fading** with a impervious to criticism and counterarguments ideation, next to psychosis border.

Objective: he present paper aims to observe the manner of expression of psychological pain, by bringing into play the various defense mechanisms and related decompensation, to a patient with borderline personality disorder.

Hypothesis: Based on a set of borderline personality, as the various defense mechanisms used by the patient fails, decompensation become increasingly severe, getting closer to the psychotic pole, in the attempt to internal management of soul pain.

Results: The study explores the defense mechanisms at stake of a borderline patient and the importance of early intervention (both pharmacological and psychotherapeutic) dealing with psychological pain, due to (pre) psychotic decompensation risk, which is increasingly more difficult, not only potential results, but the intervention itself.

Conclusions: Along with the failure of various defense mechanisms, occurs also a so - called involution of the psyche of the patient, possibility of insight and intervention rapidly decreasing, simultaneously.

EFIC5-1031

Pain treatment (psychological): interpersonal therapy

LIFESTYLE AS A TRIGGER OF THE BOUNDARY BETWEEN STRUCTURE AND BIPOLAR BORDERLINE (CASE STUDY)

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Motivation of topic: Atypical personality of this patient (which originates from a disorganized intellectuals family, with a history of suicidal attempts), her life style and environmental patterns is a challenge in terms of internal management of the concept of psychological pain. Regarding this case, it is difficult to tell where lies the boundary between *borderline personality disorder* and *bipolar disorder*.

Objectives: This paper aims to explain the impact elements of voice structure, amid a borderline personality, elements that can tilt shift towards bipolarity.

Hypothesis: Patient, situated at the boundary between borderline personality disorder manifestations and those of bipolarity, will be influenced by the behavioral patterns of his entourage, having a direct impact to flawed externalization of spiritual pain.

Methodologies: psychological evaluation, structured and unstructured clinical interview, map of life, observation during sessions, works study, transgenerational analysis, analysis of social functioning, psychoanalytic interpretations, monitoring psychological and psychiatric treatment, psychotherapy.

Results: Analyzing the elements extracted by methods above, we highlight: a borderline personality, major deficits in terms of managing pain and sadness intrinsically, amid charged voices and an environment, who consider affective disorders as a necessary and normal.

Conclusions: The question arises to what extent the influence of artist's group and life style will continue to put pressure on fragile Ego of the patient. Journey through various locations (countries), as well as the various types of therapy, discontinuity with psychiatric treatment, contributes to the dissolution of personality in question.

EFIC5-0137

Pain treatment (psychological): Exposure-based treatments

EYE MOVEMENT DESENSITIZATION AND REPROCESSING (EMDR) IN NON-SPECIFIC CHRONIC BACK PAIN: A RANDOMIZED CONTROLLED PILOT STUDY.

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Background and aims: Non-specific chronic back pain (nsCBP) remains inadequately treated. An emerging treatment approach is Eye-Movement-Desensitization-Reprocessing (EMDR) that showed promising results across different pain disorders. Aim of that randomized controlled pilot study was to measure feasibility and to estimate preliminary effect sizes.

Methods: After baseline assessment, 32 nsCBP-patients with psychological trauma were randomized to an intervention-group (IG) and a control-group (CG;1:1). The IG received 10 sessions of outpatient pain-focused EMDR-treatment. The treatment manual was based on the EMDR standard procedure, adapted for the specific needs of nsCBP-patients. The CG received treatment as usual delivered according to the German guidelines for the management of chronic back pain. Primary outcome was feasibility. Secondary outcomes were preliminary efficacy measured by change in pain intensity, interference with daily life, and treatment satisfaction from the patients' perspective.

Results: Twenty-nine patients completed the study (15 IG; 14 CG). Results confirmed the primary outcome feasibility. Considering secondary outcomes, no statistical significant group difference was found. Mean estimated effect size was 0.48 for pain intensity and 0.43 for pain interference, indicating moderate effects. However, evaluation on individual patient basis showed that 53.3% of patients in the IG could be classified as clinical relevant improved (responders). Estimated effect size in responders was 1.15 and number-needed-to-treat was 2, indicating high effects.

Conclusions: Our results point to the feasibility of a larger RCT and suggest that pain-focused EMDR-treatment is at least useful for a subgroup of nsCBP-patients that should be identified. Registered with ClinicalTrials.gov (NCT01850875).

EFIC5-0660

Pain treatment (psychological): Exposure-based treatments

BRAIN MECHANISMS UNDERLYING GRADED EXPOSURE IN VIVO TREATMENT IN CHRONIC LOW BACK PAIN: STUDY DESIGN OF BRAINEXPAIN AND PRELIMINARY DATA

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BACKGROUND: Graded Exposure in vivo (GEXP) - a treatment aimed at decreasing pain catastrophizing and pain-related fear - has been successful in reducing disability in chronic low back pain (CLBP) patients. Our ongoing study -BrainEXPain- aims to unravel the neural mechanisms underlying success of GEXP in chronic pain.

METHODS: CLBP patients receiving GEXP (n=25) and matched pain-free volunteers (n=25) will be recruited to undergo four measurements: pre-, during-, post-treatment, and follow-up. Measurements will include questionnaires, (psycho) physical and functional measures (including tactile sensibility and acuity), diaries and a (functional) MRI scan. During the fMRI scans, the low back will be directly stimulated in varying intensities with a custom designed Low Back Stimulator (LBS; see Figure), combined with an anticipation paradigm to elicit pain-related fear.



Figure: The LBS is based on a lever principle: weights added on one side will induce a direct pressure in the low back, delivered with a backstretcher segment.

RESULTS: Behavioral data indicates the LBS is suitable for our purposes: inducing parametrically varying degrees of discomfort/pain in pain-free volunteers and CLBP patients, respectively, while head movements remain within a range acceptable for fMRI. Furthermore, participants reported varying degrees of pain-related fear in the anticipation experiment. Preliminary fMRI data from two patients at baseline show activation in somatosensory cortex (S1/S2) and other regions involved in pain processing.

CONCLUSION: The current setup will enable us to investigate the sensory/discriminative processing and affective/motivational anticipation of threatening innocuous stimuli at baseline, and along the course of GEXP treatment.

THE EFFECT OF GRADED EXPOSURE IN VIVO ON BRAIN ACTIVATION IN CRPS-I (BRAINEXPAIN): STUDY DESIGN AND FIRST RESULTS

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Background and aims: Graded Exposure in Vivo (GEXP) has been proposed as a viable treatment for chronic pain. Its main assumption is that changes in pain-related fear precede and pave the way for changes in the sensory-discriminative aspects of pain processing. This ongoing study investigates the effects of GEXP on neural processes involved in pain and pain-related fear in Complex Regional Pain Syndrome type 1 (CRPS-I).

Methods: Medical ethical approval was obtained to recruit patients (n=25) with unilateral CRPS-I and matched healthy controls. Measurements pre-, mid-, post-GEXP treatment will include structural, functional and diffusion MRI, pain ratings, tests of tactile acuity, mobility, allodynia, limb temperature and volume (see figure). The mid-treatment session will be scheduled as soon as a daily questionnaires signal a drop in fear. fMRI will be performed during rest and (anticipation of innocuous) 30Hz tactile stimulation of the affected extremity and its contralateral counterpart.

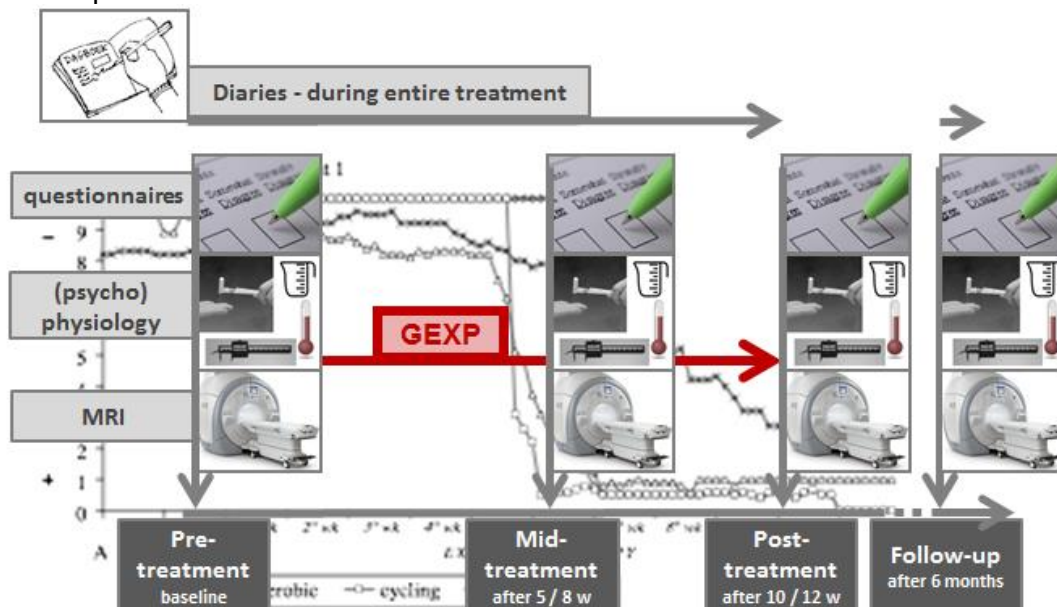


Figure: Study design overlaid on an example diary

First baseline data: So far, two CRPS-I patients have been included. Pre-treatment results for the first patient (male, 43) show greater tactile sensitivity, reduced tactile discrimination, stronger stimulation-induced activation in the contralateral somatosensory regions (S1, S2) for the affected left foot, and differential activation in the lateral and ventromedial prefrontal cortex.

Conclusions: By revealing the neural correlates of GEXP treatment, we aim to increase understanding of neural mechanisms underlying its effects, which might contribute to better treatment assignment.

EFIC5-0012

Pain treatment (psychological): Mindfulness, ACT, DBT OPTIMISING BEHAVIOURAL TREATMENT FOR HIGH_RISK PATIENTS WITH LOW BACK PAIN: WHAT DO PATIENTS AND PRACTITIONERS WANT?

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Background and aims: Trials of psychological interventions have not so far produced convincing improvements in high risk groups of patients with low back pain (LBP). We aimed to test the credibility and acceptability of an optimised intervention, Contextual Cognitive Behavioural Therapy (CCBT), and the feasibility of delivering this intervention against a best practice physiotherapy control.

Methods: A randomised controlled feasibility study was designed. Patients referred to physiotherapy were screened for fear avoidance and distress. Those eligible were randomised on a 1:1 basis to receive up to 8 sessions of CCBT delivered by trained psychologists, or physiotherapy. Measures of pain, disability, mood and beliefs, and quality of life were collected at baseline, 3 months and 6 months post-randomisation.

Results: 89 patients were randomised. Measures of credibility and acceptability at baseline and 3 months follow-up were acceptable. Response rates at 3 months follow-up (77%) were acceptable but rates at 6 months were lower than expected (68%). Independent rating of audiotapes indicated that CCBT was delivered to integrity. Exit interviews with patients, physiotherapists and psychologists indicated a preference for a combination of CCBT and physiotherapy, rather than single discipline treatment.

Conclusion: The feasibility study suggests that CCBT is an acceptable and credible intervention to people with LBP with fear avoidance and distress. However, there was consensus between clinicians and patients that optimal treatment would be a combination of physiotherapy followed by one to one CCBT sessions.

Acknowledgment: This study was funded by Arthritis Research-UK

EFIC5-0465

Pain treatment (psychological): Mindfulness, ACT, DBT

EFFECTS OF A TAILORED POSITIVE PSYCHOLOGY INTERVENTION ON WELL-BEING AND PAIN IN INDIVIDUALS WITH CHRONIC PAIN AND A PHYSICAL DISABILITY: A FEASIBILITY TRIAL

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Background: Chronic pain is a significant problem in individuals with physical disabilities deteriorating physical and psychological well-being. Strength- and resource-based interventions (positive-psychology) have been effectively applied to the general population to enhance well-being and reduce depression and anxiety.

Aim: To determine feasibility, acceptability, and efficacy of a computer-based positive-psychology-intervention in individuals with a physical disability and chronic pain.

Methods: We conducted a community-based, single-blinded, randomized, controlled, parallel group trial in persons with spinal cord injury, multiple sclerosis, neuromuscular disease, or post-polio syndrome, with pain intensity of ≥ 4 (0-10) at least half the days in the past month. Participants in the intervention-group were instructed to practice 4 personalized positive-psychology exercises during 8 weeks. Participants in the control-group were instructed to write about life details. At baseline, post-treatment, and 2.5 months follow-up, participants completed online well-being and pain-related questionnaires and rated treatment-satisfaction.

Results: Sixty-eight participants completed follow-up assessment. The positive-psychology-intervention resulted in immediate significant increases in positive affect and control over pain and significant decreases in depression, pain intensity, pain interference and catastrophizing, relative to no change in the active control treatment. Both groups showed improvements in life satisfaction. Significant changes in enhanced pain control and reduced pain interference maintained at 2.5 months follow-up. Average treatment satisfaction ratings were between "somewhat satisfied" and "very satisfied".

Conclusion

The results support the potential efficacy of a positive-psychology-intervention for improving multiple outcomes in individuals with physical disabilities and chronic pain. The findings indicate that a full size trial of the intervention is warranted.

EFIC5-0721

Pain treatment (psychological): Mindfulness, ACT, DBT

THE EFFECT OF A SHORT MINDFULNESS INTERVENTION ON EXERCISE INDUCED HYPERALGESIA IN FIBROMYALGIA PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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Background and aims

Previous research demonstrated that exercise can induce hyperalgesia in patients diagnosed with fibromyalgia (FM). The goal of the present study was to evaluate whether a short intervention of Mindfulness (MF) is able to dampen exercise induced hyperalgesia (EIH) in patients with fibromyalgia.

Methods

At intake female FM patients were randomly allocated to the intervention group (IG) (n = 13) or a control (n = 8) group (CG). During week 1 baseline measurements were assessed, being pain parameters and EIH (NRS, pin prick allodynia, manual algometry, cuff algometry before and after and the six minute walking test). In week 2, the IG received three sessions of MF (3h) and the CG received no intervention. In the third week baseline measurements were repeated.

Results

There were no significant time or interaction effects for the pain parameters and EIH ($p > 0,05$). The only significant interaction found, was the walking distance that increased in the IG and stayed constant in the CG (P time*group: 0,045).

Conclusions

The present study showed that a short MF intervention has a statistically significant influence on functionality, but not on pain and EIH. Given the small sample sizes results should be interpreted with caution, and larger trials are necessary. Nevertheless, even a short MF session seems to improve functionality, independent from pain measurements.

EFIC5-0875

Pain treatment (psychological): Mindfulness, ACT, DBT

MINDFULNESS-BASED COGNITIVE THERAPY (MBCT) AS A MIGRAINE PROPHYLAXIS - A RANDOMIZED CONTROLLED STUDY

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Background and aims

In our pilot study from 2011, a non-migraine-specific MBSR-intervention produced positive effects on migraine variables and psychological wellbeing in a migraineur sample. With an innovative migraine-specific adaptation of the mindfulness-based cognitive therapy (MBCT), we hope to intensify these effects and to gain further understanding of the underlying mechanisms of action.

Methods

The migraine-specific MBCT (8-week group intervention, consisting of migraine specific psychoeducative elements, yoga, meditation, body scans, exercises for cognitive defusion, discussion) is evaluated in a sample of $N = 52$ migraineurs concerning its efficacy in migraine prophylaxis in a randomized waitlist-controlled trial. Direct migraine parameters (i.e. impairment, frequency, intensity, medication consumption) are assessed pre and post to intervention in a 4-week headache-diary. Variables of psychological wellbeing (i.e. perceived stress, depressivity, anxiety) are assessed by questionnaires. Moreover, the influence of potential mediators (i.e. rumination, mindfulness, pain related self-efficacy, self-compassion, catastrophizing) on core migraine outcomes will be assessed.

Results

Results are expected in July 2015. Deriving from the results of our pilot study with a generic intervention (pain-related impairment $d = 0.66$) and those from other MBCT interventions [RP1], we estimate to obtain at least $d=0.70$ for our primary outcome with a migraine-specific intervention, requiring $N=52$ patients (26 per group) for a power of $1 - \beta = .80$ (one-tailed test, $\alpha=0.05$).

Conclusions

The potential of an innovative migraine-specific MBCT intervention will be evaluated according to its efficacy as a migraine prophylaxis strategy, also providing evidence about potential mediator variables through which prophylactic processes may unfold.

[RP1]ggf noch andere werte ergänzen

HEALTHCARE PROFESSIONAL PERSPECTIVES ON MULTIMODAL PAIN REHABILITATION IN PRIMARY CARE: A QUALITATIVE STUDY

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Background

Multimodal rehabilitation (MMR) for chronic pain patients is primarily provided in specialty care, and is now being implemented in primary healthcare. This implementation needs evaluation. National guidelines have been published to support assessment and provision of MMR on the appropriate level. Little is known about primary healthcare professional perceptions of working with patients using MMR. The aim was to study experiences among healthcare professionals working with MMR for chronic pain patients in primary healthcare.

Methods

Fourteen healthcare professionals were individually interviewed about their primary care work with MMR. The interviews covered experiences of assessing patients and the work with patients in the program. Transcribed interviews were analysed by qualitative content analysis.

Findings

Four categories emerged: *select patients for success; a multilevel challenge; ethical dilemmas; and considering what is a good result*. Interviewees experienced MMR work to be useful and efficient, but also challenging because of patient complexity. Inclusion criteria from the guidelines were used if there were enough patients that selection for appropriate inclusion could be made. In some circumstances, all patients were included. Opinions about who is a suitable patient for MMR influenced the selection of patients, e.g., views about gender and ethnicity. Interviewees were conflicted about not being able to offer MMR to all patients regardless of whether they were about going to return to work.

Conclusions

According to healthcare professionals, primary care MMR for chronic patient is helpful but also a challenge. Selection of patients is often dependent on factors other than guideline criteria.

MODULATION OF NF-KB ACTIVITY BY THERAPEUTIC NUCLEAR MAGNETIC RESONANCE TO DECLARE PAIN REDUCTION OBSERVED IN PATIENTS WITH OSTEOARTHRITIS

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Background and aims:

Therapeutically applied nuclear magnetic resonance (NMR) is discussed to participate in repair processes regarding cartilage and influences pain signaling. Studies concerning NMR therapy implemented within the treatment of patients with degenerative rheumatic diseases outlined pain reduction as the main clinical outcome. In spite of this significant reduction in pain, the mechanism of action of NMR at the cellular level remains to be elucidated. Therefore, clear understanding how this non invasive treatment works, might substantiate the application of NMR.

Methods:

Within a one year survey, data of more than 1000 patients with osteoarthritis (OA) of the hip and the ankle joint were collected during a 1 years follow up. Additionally, Cal-78 chondrosarcoma cells were tested for their ability to release intracellular calcium $[Ca^{2+}]_i$, to activate phosphokinases, to produce ATP and to activate NF-kB under the influence of NMR by FURA-2 measurements, Western blots as well as ATP and NF-kB activity measurements.

Results:

Analyzing clinical data, improvements of OA pain (VAS) and functional indices (Lequesne Index, Mazur Score) could be reported. NMR application on Cal-78 cells for 1 h significantly increased basal $[Ca^{2+}]_i$, measured ATP concentration was augmented. Changes in Akt-, ERK and p38 MAPKs phosphorylation were observed while NF-kB activity was reduced.

Conclusions:

Our studies indicate that NMR therapy of patients with OA is able to reduce pain. Reason for these observations might be a NMR induced modulation of $[Ca^{2+}]_i$ followed by changes in NFKB activity communicated by MAP-kinases.

EFFECTS OF FOUR-WEEK INTENSIVE AND MULTIDISCIPLINARY OCCUPATIONAL THERAPY PROGRAM IN CHRONIC LOW BACK PAIN PATIENTS WITH OR WITHOUT SPINAL EPIDURAL NEUROSTIMULATION (SCS)

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Introduction: Chronic low back pain (CLBP) affects 12–33 % of the adult population. Reasons for pain chronicity are yet poorly known. Change in postural control may be a risk factor for chronic low back pain (CLBP), although available studies are not conclusive.

Objective: To investigate whether a occupational therapy intervention is effective in relieving CLBP and pain comorbidity.

Methods: A total of 19 subjects with CLBP included in the prospective study and divided into two groups: patients who had epidural stimulation (SCS, n = 9) and patients who did not have SCS (control, n = 10). The two groups followed the same functional restoration program (8 weeks). All the subjects were evaluated before and after occupation therapy intervention. Pain severity by the visual analogue scale (VAS, 0-10cm), quality of life with the SF-12 Questionnaire, and functional disability with the Roland-Morris Questionnaire.

Results: Pain was mild to moderate in the majority of patients. The study shows less pain from pre- to post-intervention (VAS mean decrease of -2.9 cm). Significant effects in favor of mild pain intensity were also found in anxiety, depression, quality of life and sleep parameters. Self-rated adherence to the recommended relaxation training was high throughout the sample.

Conclusion: Findings support the efficacy and acceptability of a self-guided occupational therapy intervention for reducing CLBP with minimal therapy time.

CASE COMPLEXITY IN PATIENTS WITH CHRONIC NON-SPECIFIC MUSCULOSKELETAL PAIN; A DELPHI AND FEASIBILITY STUDY.

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Background and aims

Assessment of case complexity of patients with chronic non-specific musculoskeletal pain (CMP) is currently clinician based, not transparent and with low reliability. The objective of this study was to explore case complexity and to initiate development of a Case Complexity Index (CCI).

Methods

A three-round Delphi study among clinicians involved in multidisciplinary Pain Rehabilitation Programs was performed to identify important factors which are assumed to influence functioning in patients with CMP. The 10 most important factors were used to initiate development of a CCI with the mean ratings of importance per factor as weights. The feasibility of the CCI was tested in a pilot study on 16 patients with CMP.

Results

1st Round: 166 factors were identified. 2nd Round: the 10 most important factors were selected. 3rd Round: relative weights of each factor were calculated, ranging from 1.75 (features of complaints) to 3.56 (psychiatric disorders) on a scale of 0 (no weight) to 4 (very heavy weight). The assessments for the factors were mainly based on clinical examination and reasoning. Feasibility: clinicians could rate all patients using the CCI.

Conclusion:

Ten, mainly psychosocial factors were identified, which were assumed to be most important for assessment of case complexity of a patient with CMP. With these factors a CCI was created for which feasibility was established. This CCI is transparent, easy to use and might provide a basis for further developments of a structured assessment of case complexity, which may have scientific and clinical relevance.

SELF-ASSESSMENT OF HOSPITAL PERSONNEL ABOUT NON-PHARMACOLOGICAL PAIN MANAGEMENT KNOWLEDGE

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The experience of pain can fundamentally decrease the quality of life of those affected. In recent years, non-pharmacological pain management has become increasingly important in the treatment of pain patients.

Methods:

After implementing standard operating procedures for improving pain management at our Medical University Hospital, physicians and nurses of 16 departments and 43 divisions including 11 ICUs were asked to rate their knowledge of non-pharmacological interventions based on a six-item rating scale, where 1 defines excellent knowledge and 6 no knowledge.

Results:

From 2009 until 2014 we could examine the mean ratings of 1901 clinicians (785 physicians; 1116 nurses, including re-certifications) in total (Fig. 1). Nurses rated to have better knowledge (median 1.8; 25/75 percentiles = 1.6/2.2) compared to physicians (median 2.7; 25/75 percentiles = 2.2/2.9; $p < 0.001$). The re-certification showed improvements in knowledge in the majority of the departments (Fig. 2 & 3). The highest increase was found in neurosurgical, pediatric and oncologic physicians ($p < .01$), and in nurses from dental, urological and pediatric departments.

Conclusion:

The non-pharmacological pain management is an important part of pain therapy. Our survey detected major discrepancies concerning non-pharmacological knowledge between both professional groups.

Our study confirms the importance of internal education of non-pharmacological pain management for all involved clinicians, and further supports the relevance of quality-improving activities in pain management.

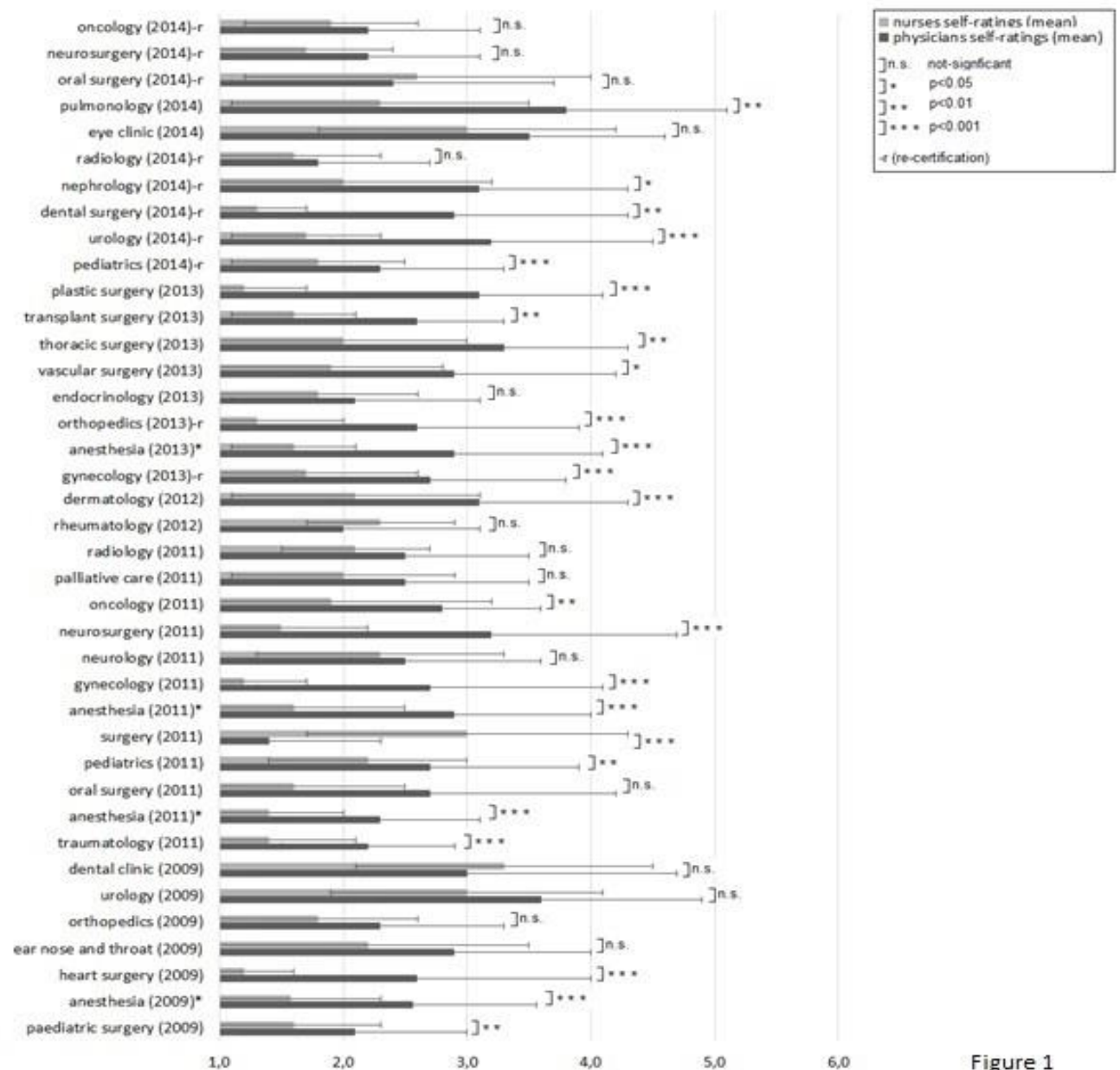


Figure 1

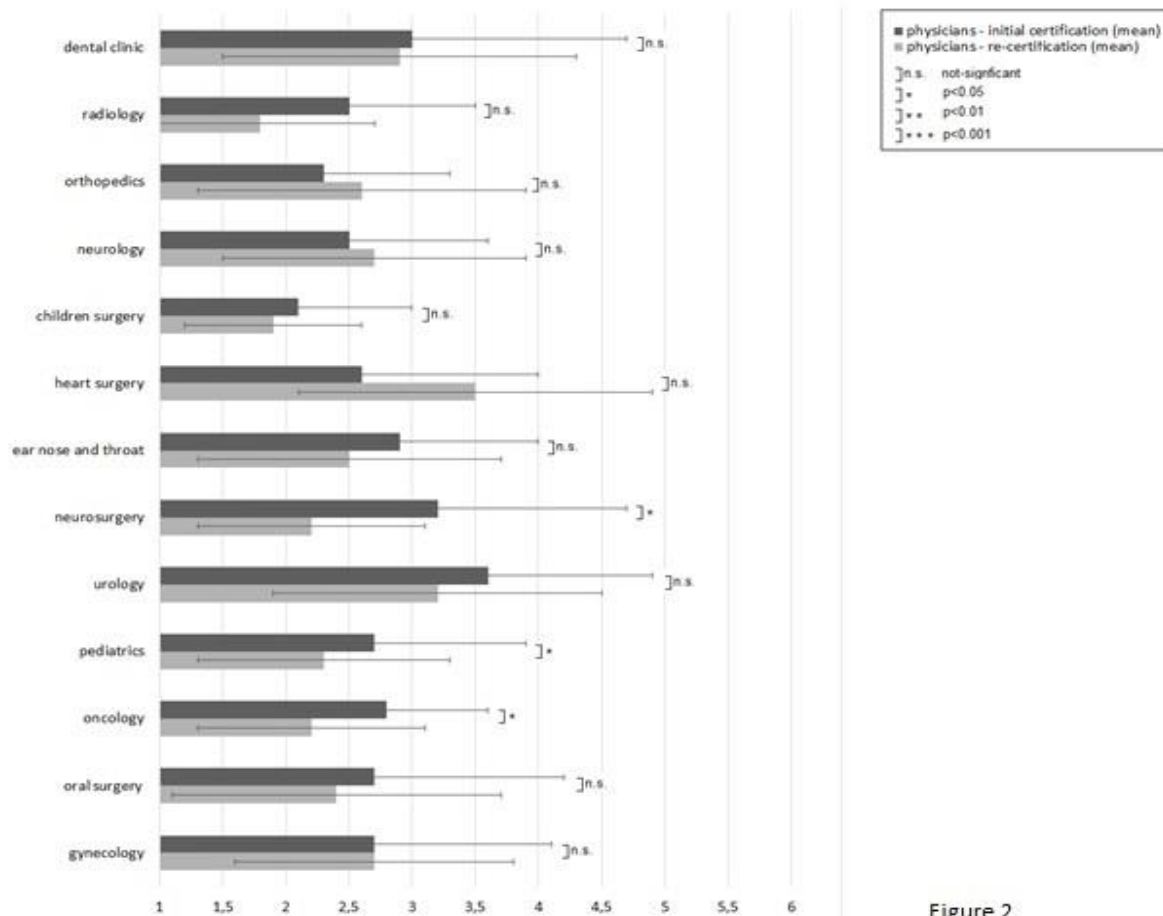


Figure 2

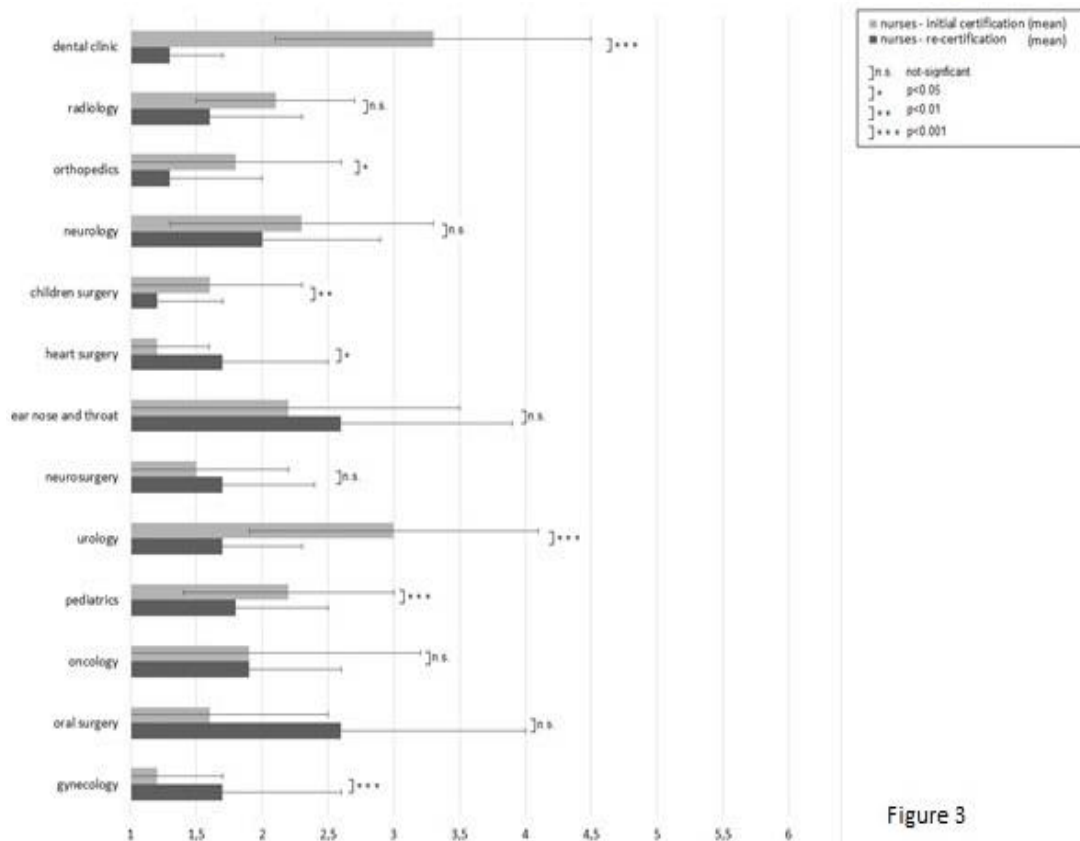


Figure 3

EFIC5-0457

Multidisciplinary pain treatments

DOSAGE OF PAIN REHABILITATION PROGRAMS FOR PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN; A NON-INFERIORITY RANDOMIZED CONTROLLED TRIAL.

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Background and aim:

Effects of dosage, including duration, of multidisciplinary pain rehabilitation programs are largely unknown and seldom investigated. The aim of this study was to analyze effects of these programs with different dosages; care as usual and care as usual short form.

Methods:

A single blinded, 2 armed, randomized controlled trial, with a non-inferiority design was performed. All patients with chronic musculoskeletal pain referred to an outpatient multidisciplinary pain rehabilitation programs were eligible for this study. Only dosage in weeks differed between the 2 groups, content was similar. The pain disability index (PDI) was primary outcome measure. Four points difference on PDI was applied as non-inferiority margin between care as usual and care as usual short form. Treatment effects within groups were expressed in standardized mean difference (SMD) and effect sizes (ES) were calculated between groups.

Results:

Both groups improved significantly on PDI (care as usual: -10.8, care as usual short form:

-8.3). However, because of extension of pain rehabilitation programs differences in dosage was limited. The 2.5 points difference on PDI falls within the non-inferiority margin but the confidence interval (CI) (-2.2 to 7.3) exceeded it. SMDs of care as usual and care as usual short form were 0.8 and 0.7 respectively. ES was 0.2.

Conclusions:

Reduction of dosage of pain rehabilitation programs did not lead to non-inferior mean results. The difference in means showed non-inferiority but the CI exceeded both the upper and the lower border of the non-inferiority margin. The results of this trial are inconclusive.

VALIDATION OF THE DANISH-LANGUAGE INJUSTICE EXPERIENCE QUESTIONNAIRE – WORK IN PROGRESS

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Background and aims

Perception of injustice is a new perspective in the current bio--psycho--social models of chronic pain and disability. In 2008, Michael J. L. Sullivan and colleagues developed and validated a 12--item self--report measure of perceived injustice: Injustice Experience Questionnaire (IEQ). IEQ addresses the degree to which individuals perceive their post--injury life as being characterized by injustice. Respondents rate on a 5--point likert scale to which extent they agree to 12 items with different thoughts and feelings of injustice described from (0) not at all to (4) all the time.

The aim of the present study was to validate the Danish--language IEQ.

Methods

From January 2014 to October 2014, 142 patients completed the following sets of questionnaires: SF36, WHO5, HADS and the Danish version of the IEQ. The patients included in this study were all treated at the Multidisciplinary Pain Centre, Rigshospitalet, University Hospital of Copenhagen (77) and at the Liaison Psychiatric Clinic, Psychiatric Centre Copenhagen (64).

Results

Chronbachs Alpha was 0.84. No outlying items were found.

Expected significant correlations between the Danish IEQ and the other 3 questionnaires were found. IEQ correlated to HADS--A, $r = 0.32$, HADS--D, $r = 0.036$, SF36 Mental, $r = -0.30$, WHO5, $r = -0.45$; all p 's ≤ 0.001 .

Conclusions

This study investigates the psychometric properties of the Danish version of the 12--item IEQ. The study finds the Danish version of IEQ to be valid and reliable.

HYPERMOBILITY AND PAIN RELATED FEAR IN CHRONIC MUSCULOSKELETAL PAIN IN ADOLESCENTS

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Background:

Hypermobility is a frequently encountered phenomenon in children and adolescents with (chronic) musculoskeletal pain. Research in physiology indicates that hypermobility leads to impaired muscle strength and balance. Whether hypermobile adolescents with chronic pain fear other activities as compared to non hypermobile adolescents with pain is currently unclear.

Primary objectives:

To study the occurrence of hypermobility in adolescents with chronic pain and to study whether hypermobile adolescents have a higher level of perceived harmfulness for balance related activities as compared to non-hypermobile adolescents.

Method:

Children and adolescents (12-21 years) with musculoskeletal pain, referred to an outpatient rehabilitation-clinic were included in this study. Hypermobility was assessed by a clinician using the Beighton score. In addition, harmfulness of activities (PHODA-youth) and disability (Functional Disability Inventory) were scored. Based on clinical experience, a subgroup of five activities out of the PHODA-youth that could be identified as 'high balance activities' were selected and resulted in a subscore for balance related activities. Differences between hypermobile and non-hypermobile adolescents were studied.

(Preliminary) Results of 28 participants: Mean age was 16,2 years (SD 3.1) and 81,4 % was female. Forty-six % of the adolescents that entered the clinic was labeled as hypermobile. The mean level of disability ($p=0.34$) and mean PHODA scores ($p=0.30$) did not differ between groups, but harmfulness scores for balance related activities differed significantly ($p=0.04$).

Conclusion: Hypermobile adolescents with chronic pain fear other activities as compared to non hypermobile adolescents with pain. This will influence rehabilitation training for hypermobile adolescents with chronic pain.

FIVE-YEAR OUTCOME OF HEALTH AND WORKING CAPACITY AFTER A REHABILITATION PROGRAM FOR WHIPLASH INJURY

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Background and aims. Persistent pain and disability of whiplash injury associated disorders (WAD) cause high burden for the individual and costs for health care. The aim was to determine state and change of health and working-capacity five years after a standardized inpatient pain program of four weeks.

Methods. This prospective cohort study quantified health and quality-of-life by the Short Form 36 (SF-36, 100=best) and compared to age-, sex-, and comorbidity-specific German population norms. Changes of health were determined using effect sizes (ES).

Results. The 59 participants had mean age of 40.3 years (sd=12.3), 83% were women, and 37% had one or more comorbidities. At 5 years, health was worse on all SF-36 scales when compared to the norms ($p<0.001$), varying from mean 41.5, norm 82.3 on role physical to mean 65.7, norm 71.0 on mental health. At 5 years, SF-36 physical functioning improved by ES=0.99 to entry and ES=0.16 to the 6 month follow-up. The corresponding effects were 2.22 and 0.83 on role physical, 1.61 and 0.78 on bodily pain, 0.89 and 0.32 on vitality, 0.61 and 0.30 on mental health; Catastrophizing decreased by ES 1.03 and 0.62 (all $p<0.001$). Median working capacity (hours/week) improved from 0 at entry to 21 at 6 months and 30 at 5 years.

Conclusions. Moderate to large long-term effects were observed. Substantial improvements still occurred between 6 and 60 months after start of the pain program. Improvements observed after the inpatient pain program can be maintained and expanded in the long-term at home.

HEALTH AND QUALITY OF LIFE OF PATIENTS WITH MEDICATION OVERUSE HEADACHE AFTER INPATIENT REHABILITATION PROGRAM

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Background and aims. The definition of medication overuse headache (MOH) implies headache on 45 or more days per 3 months. The aim was to determine health and quality of life of patients with MOH after completion of a specific in-house headache program of 2-3 weeks and to compare it with normative data.

Methods. In this cross-sectional study, patients' health-related quality-of-life and headache-related disability was measured by the Short Form 36 (SF-36) and Migraine Disability Score (MIDAS). SF-36 data were compared to German population norms, stratified by age, sex and co-morbidities.

Results. Fifty-one patients (72.5% female, mean age 47.3 years, SD=11.8) were included with an average headache duration of 25.3 years (SD=14.4). Time since the headache program varied between ½ to 2½ years. Average headache was 6.51 (SD=2.04) on the MIDAS VAS (0-10) and SF-36 bodily pain was 40.3 (SD=20.3, norm=59.0, p<0.001). Headache-specific physical function averaged to 78.4 (SD=23.5) on the MIDAS, 68.6% of the patients had less than 45 days headache per 3 months. The mean SF-36 physical functioning was 78.4, SD=21.4, norm=83.3, p=0.497. All other SF-36 scales were significantly lower than expected from the norm (all p<0.001), with maximal difference on SF-36 social functioning (mean 56.8, SD=28.1, norm 82.5).

Conclusions. Pain and psycho-social impairment levels were higher than expected from the norms. Functional impairment was high on the headache-specific scales but not on the generic SF-36. Although substantial burden of headache was still observed after the headache program, more than 2/3 MOH patients changed to episodic headaches.

EFFECTIVENESS AND MODERATORS OF THE PREPARE RCT USING A NURSE-LED MOTIVATIONAL INTERVIEWING BASED PRE-TREATMENT IN PATIENTS WITH NON-SPECIFIC CHRONIC PAIN

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Background and aims: Behaviorally based pain rehabilitation treatment is encountering non-adherence and drop-out from treatment frequently. To evaluate whether a nurse-led pre-treatment is advantageous in terms of decreasing drop-out from treatment, and increasing participation and functioning after the treatment, two different forms of nurse-led pre-treatment were compared in an RCT: Motivational Interviewing (MI) and pain education control.

Methods: From 2010-2012 a total of 163 patients with general non-specific chronic pain or fibromyalgia (mean age 46 years; gender 69% female, median pain duration 6 years) were included in the RCT, n=81 were randomly assigned to the MI-group. Mixed models analysis took place with an intention-to-treat and a per protocol approach was performed. Additionally, a pre-specified moderation analysis was executed.

Results: Data analysis revealed that the overall effects of the MI-based pre-treatment did not significantly differ from the pain education control intervention in terms of drop-out, participation, and functioning. Per-protocol analysis confirmed the previous findings. Functioning at 6 months post treatment appeared to be statistically significant higher in the MI-group.

A slight increase in social participation occurred over time in both groups. Significantly detrimental moderating effects were shown for a low level of motivation on participation. Moderation analysis further revealed that for patients without the diagnosis fibromyalgia, a clinically meaningful improvement in functioning occurred.

Conclusions: The results suggest that a MI-based pre-treatment in patients with chronic pain or fibromyalgia was not superior compared to pain education. For some sub-groups MI-based pre-treatment was slightly advantageous.

DO PATIENTS WITH CHRONIC PAIN IN AN INPATIENT PAIN MANAGEMENT PROGRAM BENEFIT FROM AN ADDITIONAL PARTICIPATION IN THE LAUGHTER YOGA TRAINING?

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Background and aims

Studies reveal that pain patients who voluntarily took part at a Laughter Yoga training, experienced significant pain reduction, upward mood swing and a significant improvement of community sense. The latter is an active factor in improving group cohesion and thus can contribute to increasing the effectiveness of a group-based pain management program. This study examines whether participation in the Laughter Yoga training increases the effect of a inpatient pain management program.

Method

Of the 171 patients who participated in an inpatient pain management program, 101 patients took part in the optional Laughter Yoga training (2x/ week for 30 minutes per session). Initially, the patients completed an initial enrollment questionnaire and at the end of their stay an evaluation form. The pre-, post and group comparisons were calculated using SPSS 19.

Results

There were no significant differences in current pain intensity, impairments in everyday life, leisure and/or work ability between either of the two groups. Despite anomalies in results relating to general well-being, physical and mental quality of life, there were no differences in selected psychometric variables within both groups. Both Laughter Yoga participants and non-participants improved in all the variables, but there were no significant difference between the two groups.

Conclusion

Laughter Yoga seems to have short-term positive effects on its participants.

There do not seem to be any significant differences to non participants, which suggests an increase in the effectiveness of the pain management program in combination with the Laughter Yoga training.

EFIC5-0544

Multidisciplinary pain treatments

PAINS AFTER MAJOR AMPUTATIONS OF THE LIMBS

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Background and aims: The loss of a limb after amputation is a traumatic event. The aim of this study is to present the multidisciplinary management of pain in Tunisian amputees.

Method: In this retrospective study, the pain of all hospitalized amputees of the limb(s) in department of PRM at the National Institute of Orthopaedic MT Kassab between January 2009 and December 2014 was evaluated by visual analogue scale or DN4 questionnaire. Age, sex, etiology and level of amputation, type of pain, functional independence (FIM), management of pains were precised.

Results: 47 patients (9 women and 38 men) , mean age 56.81 years, were included. The etiologies of amputation were vascular (36 cases), due to traffic accident (9) or to electrification (2). The levels were trans femoral (24 cases), trans tibial (19), bilateral (4). Phantom limb pain was present in 83.33%; pain due to disadaptation to the prosthesis in 76.28% or due to neuromas in 23.78% . The FIM was 92.44 / 126. The score of DN4 questionnaire was 7.24/ 10. The VAS ranged from 4/10 to 10/10. PRM was always used. Medical treatment was based on analgesics and tricyclic antidepressants, adaptation of the socket element in 27 patients and surgical revision of the stump in 2 patients. 5 patients needed also psychiatric management, 7 patients care in pain center.

Conclusion: The management of pain is fundamental in the care of amputees, since the early stage (perioperative analgesia) until socio-professional integration, involving various health professionals (surgeon, physical and rehabilitation physician, psychiatrist,...) to improve patient's quality of life.

PERCUTANEOUS SACROPLASTY UNDER FLUOROSCOPIC GUIDANCE COMBINED WITH TRANSFORAMINAL EPIDURAL BLOCK FOR SACRAL INSUFFICIENCY FRACTURE RESULTING FROM METASTATIC TUMOR AND OSTEOPOROSIS

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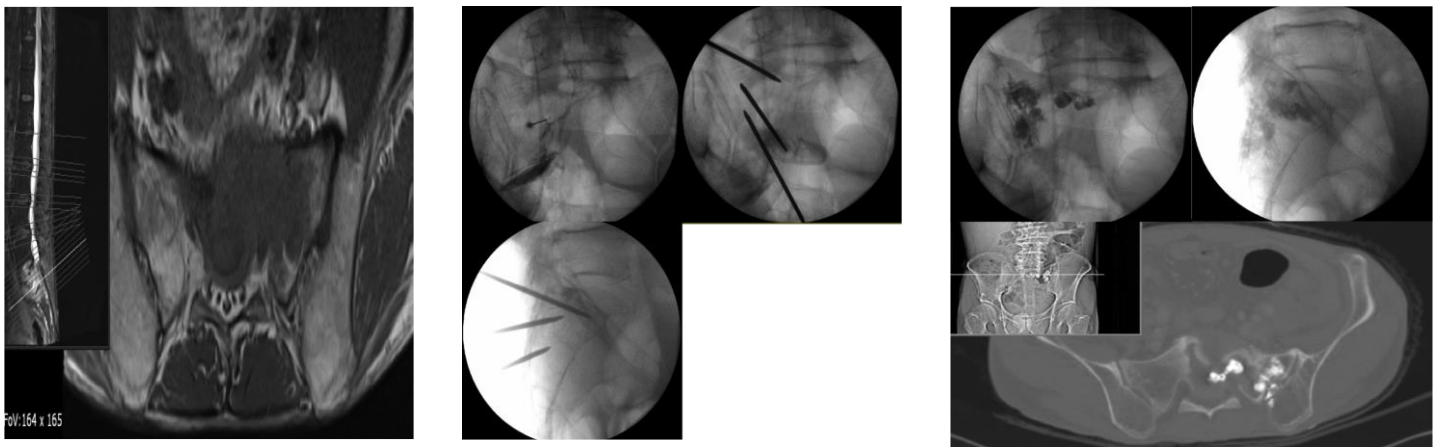
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Background: Sacral insufficiency fracture resulting from a metastatic tumor or an osteoporotic fracture causes severe low back pain and radiating pain. Percutaneous sacroplasty under fluoroscopy- or CT-guidance is one of the effective treatment modalities for sacral insufficiency fracture and its pain. Because of the structural complexity of the sacrum, obtaining an epidurogram of the S1 and S2 nerve roots before the start of the procedure can be helpful to avoid nerve injury. We present two successful cases of percutaneous sacroplasty performed under fluoroscopic guidance.

Method: A 65-year-old man with sacral metastasis from stomach cancer and a 52-year-old man with sacral insufficiency fracture were suffering from severe buttock pain and radiating pain. After epidurography of the S1 and S2 nerve roots with steroid and contrast dye, percutaneous sacroplasty with fluoroscopy on the S1 or S2 body and alae was performed on both patients.

Result: There was no cement leakage or any other major complications. Both patients experienced significant reductions in pain.

Conclusion: Safe sacroplasty can be possible if there is careful planning of needle insertion and cement delivery based on MRI or CT imaging conducted before the procedure. Assisted pain control by tranforaminal epidural block and epidurogram would be helpful. Further investigation of sacroplasty on both the sacral bodies and alae under fluoroscopy will be needed for broader clinical applications.



THE EXTENDED INDICATION OF PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY (PELD) FOR FAR LATERAL DISC HERNIATION AT L5-S1 WITH FOOT DROP

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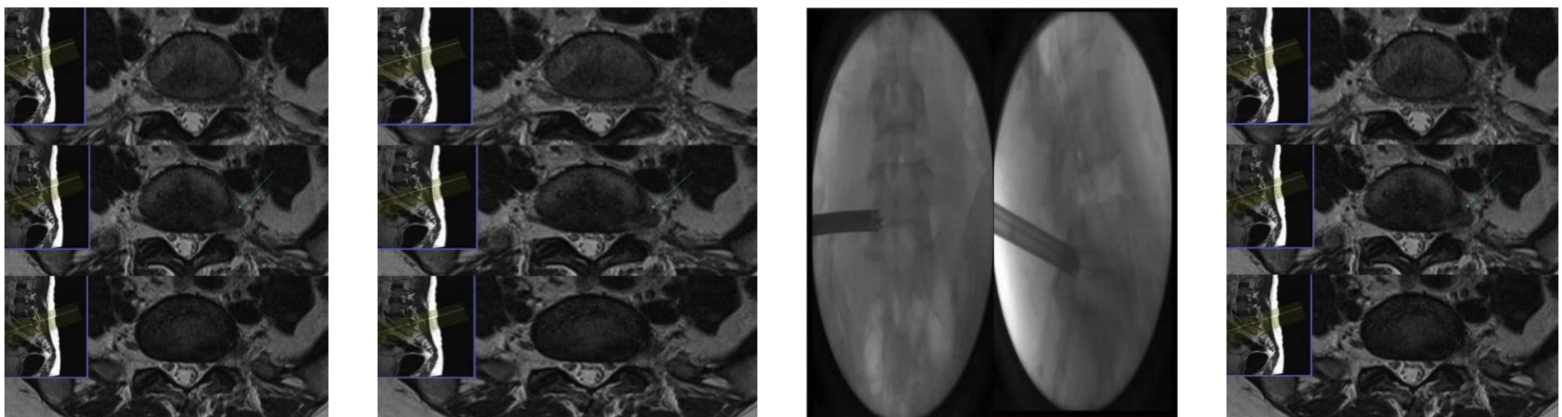
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Background: Foraminal or extraforaminal far lateral disc herniations (FLDH) extending into or beyond the foraminal zone have been recognized as between 7–12% of all lumbosacral disc herniations. Conventional posterior laminectomy may not provide good access to FLDH. Use of a percutaneous endoscopic technique to treat such FLDH patients can decrease the surgical morbidity while achieving better outcomes. We took a step to utilize the advantages of Percutaneous Endoscopic Lumbar Discectomy (PELD) and to determine the appropriate approach for FLDH at the L5-S1 level.

Methods: A 41-year-old female who presented with pain of Numeric Rating Scale (NRS) 8/10 on left L5 dermatome. Her SLR test showed pain at an angle of 10 degrees on the left side. Great toe dorsiflexion was graded as 3/5 on the left side. MRI showed disc extrusion to the left extraforaminal zone with superior foraminal migration below the L5 pedicle with a left L5 nerve compression. The authors endoscopically resected lumbar extruded disc to the left extraforaminal zone with superior foraminal migration through the epiduroscopic technique without facetectomy.

Results: The patient's postoperative course was notable for 90% pain relief within 30 minutes after the operation. Left great toe dorsiflexion had recovered to a grade of 5/5 at the patient's 6-week follow-up.

Conclusion: Most lumbar disc herniation patients with foot drop are treated with the open surgery. However, if a proper trajectory of approach could be designed during the preoperative estimation, PELD through the epiduroscopic technique can be used to treat FLDH patients with motor deficit.



PAIN REHAB DURING PUBERTY; WORKING IN ADULthood? WORK PARTICIPATION OF ADULTS WHO RECEIVED PAIN REHABILITATION DURING PUBERTY; A LONG-TERM FOLLOW-UP.

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Background and aims: The long-term results of an inpatient pain rehabilitation program during puberty with regards to work participation are unevaluated. Knowledge about the potential influence on future work might help to improve rehabilitation programs. The aim of this study is to explore the long-term follow-up status of an inpatient pain rehabilitation program during puberty with regards to work participation later on in life.

Methods: Mixed-method study with semi-structured interviews and questionnaires. The semi-structured interviews contained questions about work participation in the past and present. The questionnaires measured working status, quality and quantity of the work and pain. Potential participants: all patients who received an inpatient pain rehabilitation program 15-20 years ago because of chronic non-specific pain. Analyses were done according to the method of thematic analysis.

Results: 14 adults consented to participate (12 females). Clinical status: Similar: n=9; no pain: n=2; other health complaints: n=3. Present work participation: paid work: n=10; fulltime: n=2; part-time: n=8. Self-reported quality of the work: mean 9.6 (scale 0-10). Influence of the rehabilitation program on work: no remembrance; no influence; principles learned (ergonomics, energy management); complaints were gone; finishing high school; received advice on further education.

Conclusions: Ten out of 14 participants are presently working, most despite pain. The influence of their pain rehabilitation program on their work participation is generally regarded as positive. Themes that are identified as positively (or negatively) contributing to future work participation need further research.

Acknowledgements: This research had been cofinanced by a grant of the Cornelia Stichting.

EFIC5-0595

Multidisciplinary pain treatments

NEEDS AND REQUESTS – PATIENTS AND PHYSICIANS VOICES ABOUT IMPROVING THE MANAGEMENT OF SPINAL CORD INJURY NEUROPATHIC PAIN

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Purpose: The purpose was to explore patients' and involved physicians' needs and requests for improving their management of neuropathic pain following spinal cord injury (SCI).

Methods: Sixteen patients with SCI and neuropathic pain, and nine physicians with extensive experience in the field, were interviewed in focus-groups or individual interviews. An emergent design was used; the interviews and analyses were carried out in parallel, making it possible to use and deepen new emerging knowledge. The interviews were transcribed verbatim and analysed according to content analysis.

Results: A final model with four categories described the results. Three categories covered the current situation in pain management: *limitations in structure, lack of knowledge and competence*, and *frustrations*. A fourth category, *needs and requests*, described suggestions by patients and physicians for future improvements. Suggestions included increased patient participation, increased patient involvement in the pain rehabilitation process, support in the process of learning to live with pain, implementation of multi-modal pain rehabilitation, and the use of complementary treatments for neuropathic pain.

Conclusion: Neuropathic pain following SCI needs to be assessed and treated using a structured, inter-disciplinary, multi-modal rehabilitation approach involving patients in planning and decision-making.

EFIC5-0614

Multidisciplinary pain treatments

MULTIMODAL STEPPED CARE APPROACH WITH ACUPUNCTURE AND PALMITOYLETHANOLAMIDE FOR POST STROKE CENTRAL PAIN

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Introduction

Central Pain Syndromes (CPS) include i.a. thalamic pain syndrome, post-stroke syndrome. CPSP patients experience severe pain, sensory abnormalities, and emotional distress. Intolerable side effects hinder pharmacological pain control.

We report the multimodal approach of a refractory central pain post stroke patient with acupuncture and the natural compound palmitoylethanolamide (PEA), a glial modulator and peroxysome-activated receptor alpha agonist, focusing on chronobiology and epigenetic factors involved in drug response and side effects.

Case report

A 37-year female patient suffered stroke with thalamic pain and discomfort in the right body half. Pharmacological treatment was insufficient. After two years left sided motor cortex stimulation was performed. After 16 years the patient attended the pain clinic with severe refractory pain, major drug side effects, distress, obesity, sleep disorders, and no social life.

Treatment consisted of methadone 120 mg and duloxetine 120 mg. Acupuncture resulted in instable pain reduction. We added PEA, vitamin D and nutritional rehabilitation. Pain stabilized with better response to the same dose methadone. The patient recovered sleep, lost weight, improved daily activity, social contacts, and took the first vacation since 20 years.

Conclusion

This multimodal approach influencing neuropathic pain via the modulation of non-neuronal cells (glial and mast cells) is a promising strategy.

Acupuncture and PEA, added the classical analgesics are safe treatments for neuropathic pain. Acupuncture increases brain activity in regions closely associated with a wider pain matrix responsible for modulating both the sensation and affective pain perception.

This treatment deserves further investigation and the development of targeted treatment strategies

EFIC5-0642**Multidisciplinary pain treatments****SOFTWARE CONTROLLED VOLTAGE SHORT PULSES GENERATOR (SO. CO. SHORT):
CLINICAL EXPERIENCE**

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BACKGROUND AND AIMS: So.Co.Short is an electromedical non invasive device offering an innovative therapeutic approach for painful syndromes such as inflammation, microcirculation disorders and muscle contractures. It generates voltage pulses applied transcutaneously through electrodes surrounding the painful area. Aim of the study is to evaluate whether So.Co.Short can be included in a multimodal treatment of painful diseases or be a valid therapeutic option when drugs are contraindicated.

METHODS: This retrospective observational study evaluated 580 patients who completed 10 consecutive sessions of So.Co.Short therapy in two weeks at the Tor Vergata Polyclinic Pain Unit in Rome from June 2012 to April 2014. All the patients were affected by acute or chronic osteoarticular and/or vascular inflammatory pain. By protocol, during the electrotherapy patients on analgesics did not modify daily dosages. We evaluated pain intensity by Numerical Rating Scale(NRS) at T0, at the end of the 10th session(T1) and 45 days later on follow-up(T2).

RESULTS:

PATHOLOGY	MEAN NRS T0	MEAN NRS T1
Vasculopathy	7,22	3,48
Shoulder arthrosis	7,08	3,53
Hand arthrosis	7,15	3,12
Foot arthrosis	6,82	3,71
Knee arthrosis	7,2	3,01
Hip arthrosis	7,03	3,62
Neck pain	6,98	3,6
Back pain	7,35	3,82
Epycondilitis	6,76	3,5

At T2 mean NRS values were similar to T1 and mean analgesic dosages were reduced compared to T0. Joint function and/or cutaneous ulcers, when present, improved sensibly.

CONCLUSIONS: So. Co. Short is efficacious in pain management either as monotherapy or associated to analgesics displaying no side effects and excellent patient compliance.

MULTIDISCIPLINARY INTEGRAL APPROACH OF PATIENT WITH BREAKTHROUGH CANCER PAIN

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Objectives: Breakthrough cancer pain (BTcP) is a common symptom that contributes substantially to the suffering experienced by cancer patients, however, it is often unrecognized and undertreated. We aim to discuss the clinical characteristics of BTcP and provide practical strategies for managing it effectively.

Methods: A multidisciplinary panel of experts met to establish the actual knowledge on BTcP. The panel defined 36 key questions that were answered according to the best evidence and their experience.

Results: Topics covered by the panel included the definition, prevalence, diagnosis, treatment and multi-disciplinary management of BTcP. A precise pain assessment is essential to identify all the areas of impact on patients' quality of life and to plan the most appropriate treatment. BTcP requires a combination of management strategies and a multidisciplinary approach, which may include pharmacological and non-pharmacological treatments. The ideal pharmacological treatment for BTcP episodes must have pharmacokinetic properties that closely match the temporal characteristics of a BTcP episode, mainly a rapid onset of action and a relatively short duration of action. In addition, it must be potent, non-invasive, and simple to administer, have minimal side effects and be cost-effective. Rapid-onset transmucosal fentanyl preparations are the drugs most fitting to the analgesic needs of BTcP. Collaboration between health providers, patients and carers represents an essential component of the management of BTcP.

Conclusion: This document provides an overview of the clinical characteristics of BTcP and provides practical strategies for a better diagnose and treatment.

PATIENTS AT A PAIN CLINIC – CHARACTERISTICS, PATIENT-REPORTED OUTCOME MEASURES AND PREDICTING FACTORS FROM BASELINE TO ONE YEAR LATER

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Background and aims: Patients with chronic pain conditions are often treated at pain clinics or rehabilitation centers in Sweden. There are several studies from pain rehabilitation units, but knowledge about the heterogeneous group of patients treated at pain clinics is scarce. To improve a patient centered care, more knowledge about patients' characteristics, treatment outcome and predicting factors is needed.

Treatment at the present pain clinic included individually planned pharmacological treatment, and/or physical-, educational- and psychological interventions.

The aim of this study was to describe characteristics of patients treated at a pain clinic and to follow up patient-reported outcome measures (PROM) after one year. Further to identify predicting factors for change of the PROM.

Methods: This was a prospective observational study at a pain clinic offering conventional pain treatment to patients with chronic pain. *Inclusion:* 276 adults, with miscellaneous pain diagnoses and individually treated, were consecutively included. *Data collection:* PROM for health related quality of life (EQ-5D), depression and anxiety (HADS), insomnia (ISI), pain related disability (PDI), kinesiophobia (TSK), sense of coherence (SOC), current pain intensity (VAS), pain localization and sick leave were collected. *Statistics:* descriptive statistics and logistic regression analysis were used.

Results: Preliminary results showed an average moderate severity of pain and pain related symptoms at baseline and significant improvement in EQ-5D, ISI, PDI, VAS and TSK at follow up. Results from the regression analysis will be shown.

Conclusions: Conventional pain treatment at a pain clinic significantly improved important PROM.

CHRONIC PAIN IN THE ELDERLY: LIVED EXPERIENCES IN PRIMARY HEALTH CARE IN BRAZIL AND SPAIN COUNTRIES

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Chronic pain is a symptom that affects humans since the beginning of civilization. It is defined by the World Health Organization as that associated with disease processes and extending for six months or more, about 30% of the population suffers from chronic pain. This is a qualitative study with in-depth interviews chronic pain in elderly people from the cities of Botucatu (Brazil) and Seville (Spain). Our aim was to describe and compare the experience of chronic pain and its resolution in elderly people of both countries. Received approval from Research Ethics Committee of the Botucatu School of Medicine – University Estadual Paulista, according to Letter 6-7.043, dated April 07, 2014. We interviewed 30 patients, 15 in each country, of both genders. It was reported experience of chronic pain. The mean age was 73 and 82 respectively, more verweight pain over the two years of moderate to severe intensity. It is noteworthy that in both countries the elderly people behaved similarly in the fight against reporting functional impairment, limitation of motion of chronic pain; social constraints, sleep disorders, anxiety causes suffering physicaland psychological harm. All people reported using plenty of pills and physical therapy as a therapeutic method to resolve their pain, did not mention the involvement of other professional. Although Spain and Brazil are countries with different social and cultural conditions, both elderly people behaved similarly in the treatment of chronic pain, attracting attention to the need for multidisciplinary care and chronic pain requires holistic approach to patients.

EFIC5-0700

Multidisciplinary pain treatments

THE ULYSSES COGNITIVE BEHAVIOURAL PAIN MANAGEMENT PROGRAMME: WHAT STRATEGIES DO PATIENTS CONTINUE TO USE LONG TERM?

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Background & Aims:

Cognitive behavioural pain management programmes (CBT-PMPs) aim to teach patients how to manage their chronic pain long term. However, follow up studies are usually of one year's duration only [1]. The aims of this study are to establish what cognitive behavioural strategies patients continue to use to manage their pain long-term post CBT-PMP.

Methods:

A questionnaire based postal survey was undertaken of the previous participants of the Ulysses programme (2001-2012) (n=582). The questionnaire comprises three sections: (i) Demographic information (ii) what cognitive behavioural strategies patients utilised (iii) patients perception of benefit & satisfaction with CBT-PMP.

Results:

The preliminary response rate is 37% (n=216). Respondents mean (sd) age was 52 (10.56) years with a mean (sd) pain rating of 5.18 (1.9). Back pain (n= 103, 55.1 %) emerged as the main pain location with "work accident" (n= 53, 24.5%) as the primary cause of pain. Pacing (n=98, 46%), stretching (n=95, 44.8%) and exercise (n=93, 44.1%) were the most utilised pain principles.

Avoiding negative thoughts (n=138, 65.4%) and mindfulness (n=125, 59%) were the most commonly employed CBT strategies. High satisfaction ratings (n=148, 69.8%) were recorded and 48.6% (n=102) rated benefit gained as "much improved" or "completely recovered".

Conclusion:

Preliminary results suggest that there are substantial long term effects from a CBT-PMP for chronic pain patients.

1. Nicholas MK, Asghari A, Corbett M et al (2012) Is adherence to pain self-management strategies associated with improved pain, depression and disability in those with disabling chronic pain? Eur J Pain 1:93–104

EFIC5-0093

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

M-HEALTH APPLICATION FOR REMOTE HEADACHE PATIENTS MONITORING

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Background and aims: There is scope to improve patient monitoring and safety in the headache clinic by employing novel mobile health (m-health) technologies. Mobile applications could replace traditional paper based diaries and outcome measures and provide several advantages including improved monitoring of historical responses to therapies, improved recording of side effects and can be adapted to improve communication between patients and clinicians. We therefore aimed to develop a mobile application based system to allow remote monitoring of patients with chronic headache.

Methods: We designed a system consisting of two components; i) a mobile application that enables patients to complete diaries and outcome forms on a regular basis anytime/anywhere, and ii) a back-end system, restricted to clinicians which allows central control and monitoring. The back-end system allows clinicians to create a unique patient profile and receive and analyse data received from patients in numerical and graphical formats. An inbuilt traffic light system alerts the clinician if patients are not managing well at home and can be set to trigger an early clinic review.

Discussion and future directions: We have developed a novel system which has potential to improve patient monitoring, compliance and safety. We now aim to evaluate this application in the headache clinic and assess acceptability to patients.

EFIC5-0027

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

NEW PROGRAM FOR ESTIMATION DEGREE THE SEVERITY OF THE PATIENT

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Based on previously developed a universal analytical system of the physiological state of the body (PHUAS) by the author proposed a new automatic program objective assessment of the severity of the patient's condition. Overall, the program can improve health of the population in terms of underfunding by the rapid and objective examination of a large quantity of people. Early on, with the help of the developed program is made possible among surveyed identify risk groups in the severity of general condition, to determine the optimal and effective options for prevention and treatment, saving time and money for the survey, use the data to correlate them with various factors influence of the environment (ecology, nutrition, addictions, drug, vaccine, methods of intensive therapy, pharmacotherapy, etc.).

EFIC5-0155

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

ASSESSING MANAGEMENT OF PERIOPERATIVE PAIN AT THE PRIZEN REGIONAL HOSPITAL IN KOSOVO

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Aims

Data about pain-related Patient Reported Outcomes (PROs) and perioperative pain management was collected in one hospital in Kosovo assessing need for optimizing management.

Methods

Prizren Regional Hospital has 521 beds; is the second largest hospital in Kosovo. PAIN OUT methodology was used to collect data. PAIN OUT is an international registry, providing standardized and validated tools to assess pain management after surgery.

Results

Findings were obtained from 139 General Surgery (GS) and 92 Obstetric & Gynaecological (OBGYN) patients on the first day after surgery, during November 2014 – February 2015. All patients gave consent. Patients filled in the International Pain Outcomes questionnaire in Albanian. Most common GS procedures were laparoscopic & open cholecystectomy (n=61 & 22) and herniectomy (n=32); for OBGYN, Caesarean Delivery (n=81). General anaesthesia was the most common form of anaesthesia; wound infiltration was used with n=9 patients; IM diclofenac was the most commonly administered analgesic after surgery; tramadol is the only opioid available outside the operating room, administered to n=40 of GS and to n=4 of OBGYN patients. PROs indicate severe pain: patients on both wards reported being >40% (average) of the time in severe pain, >50% reported worst pain of ≥ 7 (0-10 scale); >30% reported interference with coughing at a level of ≥ 7 (0-10 scale); > 65% wished for more pain treatment.

Conclusions

Patients after GS and OBGYN surgical procedures at the Prizen Regional Hospital reported severe pain-related outcomes. Plans to improve management are currently being developed. Carried out as part of the IASP Post-Operative Pain Improvement project.

EFIC5-0157

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

WHEN DOES “DISCOMFORT” BECOME “PAIN”: A THUMBNAIL PRESSURE STUDY

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Background

The concept of Discomfort vs Pain requires investigation. Anecdotally patients asked about pain sometimes say “It’s not pain, it’s discomfort”. Clinically patients are only asked to report pain when this may not be the best descriptor of what they feel.

This study aimed to explore, using thumb-nail pressure, the threshold in a chronic musculoskeletal pain (CMP) population at which patients reported discomfort became pain.

Methodology

N=50 CMP underwent thumb-nail pressure testing using A Wagner FPIX 50 Digital Algometer. Patients completed VAS pain (VP) and VAS discomfort (VD) scales after each test starting with 1kg/cm² thumb-nail pressure and increasing by 1kg/cm² increments to a maximum of 12kg/cm². An average of left and right side scores was taken. Patients were instructed to stop the test if they felt more than moderate pain. Testing was also stopped upon verbal pain complaint, “Ouch” for-instance, non-verbal pain complaint, such as wincing, or if VAS pain reached 70 or more.

Results

Table 1. Scores at the point before Pain > Discomfort.

N=50 CMP	KG/cm ² when Pain > Discomfort	VP before	VD before
		Pain > Discomfort	Pain > Discomfort
Mean Score	8.7	20.7	44.1
Standard Deviation	2.4	21.7	31.9

T-testing was undertaken, there was a significant difference (p=0.000) between Pain and Discomfort scores before Pain became greater than Discomfort.

Conclusions

Pain and Discomfort may represent independent constructs that can, and perhaps should, be measures separately. These results question descriptors such as that used by the EQ5D that asks patients to rate ‘Pain and Discomfort’.

EFIC5-0194

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

HOW MUCH PAIN IS ACCEPTABLE?

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Background:

For patients with cancer-related pain, the numerical rating scale is the most frequently used instrument to measure pain intensity. In the literature, it has been suggested to interpret these ratings in relation to the score which is acceptable to the individual patient. We aimed to examine the feasibility and stability of acceptable pain intensity (API).

Methods:

Patients included in this study originated from a randomized controlled trial on a patient pain education program. Patients were asked to identify the intensity of pain that would be acceptable with 0-10 numeric rating scales at baseline and after 2, 4 and 8 weeks. Data were analysed using nonparametric tests.

Results:

72 patients were included, 35% male, mean age 59 years. Almost all patients (90%) were able to give a score for API. At baseline, 51% patients rated their API as mild, 36% rated their API in the range which is considered as moderate and 13% as severe pain. API remained stable in the standard care group (from 4.6 (range:0-8) to 5.0 (range:2-8)), and decreased in the intervention group (from 4.6 (range:2-8) to 3.8 (range:0-7), difference between groups $P < 0.05$).

Conclusions:

Acceptable pain intensity is a feasible and simple measurement to indicate patients' own thresholds. The majority of patients was capable to answer this question. Patients rated their acceptable pain higher than pain specialists aim to achieve. Acceptable pain intensity especially decreased in the patients who were educated about pain and pain management, indicating that patients' barriers influence patients' level of acceptable pain.

DN4 AS A SCREENING TOOL FOR NEUROPATHIC PAIN IN LOW BACK PAIN

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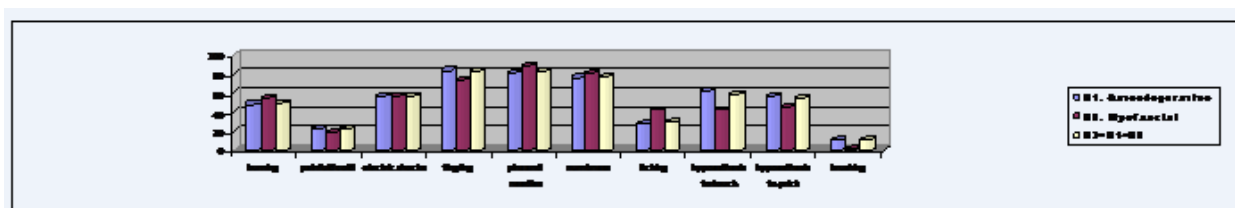
BACKGROUND AND AIMS: Data to determine the prevalence of neuropathic pain (NP) in patients with chronic lumbar pain (CLP) using DN4 is lacking. Objectives: 1. To determine NP prevalence and its components in CLP with DN4 and to evaluate whether there are any differences due to pain origin. 2. To assess whether patients with CLP and NP have a different profile than patients with CLP without NP.

METHODS: We studied 886 patients with CLP. Data recorded were: age, etiologic diagnoses: G1 (osteodegenerative), G2 (myofascial), G3 (G1 + G2), questionnaires: BPI (average VAE in the last 24hs, sleep alterations), HAD, SF12 (PCS, MCS), Oswestry, and DN4 (NP defined if ≥ 4). Categorical variables: contingency tables and chi-squared. Quantitative variables: "t"-test ($p = 0,05$).

RESULTS:

Table 1. NP prevalence

Group	n	NP (%)	Chi-squared significance
G1	776	43.9 (n=341)	.356
G2	110	39.1 (n=43)	
G3 (G1+G2)	886	43.3 (n=384)	--

Graphic 1. Distribution of DN4 components (patients with CLP and NP)

Patients with CLP and NP were younger, and they had a higher VAE, more sleep alterations, greater anxiety and depression, worse functional capacity (MCS component) and quality of life ($p < 0,05$).

CONCLUSIONS: According to DN4, NP prevalence in the studied patients was 43.3%. Although it was higher when the etiology was osteodegenerative, our results suggest that patients with a myofascial etiology also have mixed pain. Depending on the etiology, predominant signs and symptoms in the DN4 vary. Patients with LCP and NP were younger and had higher pain intensity and more psychosocial alterations.

EFIC5-0321

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

PREVALENCE AND PREDICTORS OF POOR GLOBAL RECOVERY ONE YEAR AFTER ORTHOPAEDIC DAY SURGERY

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Background and aims

In the Netherlands, 52% of all surgical procedures are performed ambulatory. Previous studies have shown prevalences of poor global recovery to be relatively high in the year after surgery. This study evaluates the prevalence and predictors of poor global recovery one year after orthopaedic day surgery.

Methods

Patients undergoing orthopaedic day surgery (e.g. knee, shoulder, bone surgery; n=230) were included in our study. Outcome and predictor variables were measured using questionnaire packages at three time-points: one week before surgery, four days, and one year after surgery. For analysis of global recovery the 1-item Global Surgical Recovery Index (GSR) was used, which measures the extent to which patients consider themselves recovered from the surgery. Poor global recovery was defined as $GSR \leq 80\%$. Logistic regression analysis was performed to evaluate the impact of socio-demographic, clinical and psychological variables on GSR.

Results

The median (interquartile range) GSR one year after surgery was 90% (70–99%). Nevertheless, the prevalence of poor global recovery was 47%. Predictors of poor global recovery were preoperative analgesic use (OR 0.45; CI 0.25-0.79), low pre- and postoperative quality of life (4.69; 1.23-17.92 and 4.54; 1.43-14.39), and poor global recovery four days after surgery (2.65; 0.84-8.42).

Conclusions

Our study showed that one year after orthopaedic day surgery, almost half of the patients showed a poor global recovery ($GSR \leq 80\%$). Preoperative analgesic use, a low quality of life and a poor global recovery four days after the surgery, were predictors for poor global recovery one year after orthopaedic outpatient surgery.

EFIC5-0331

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

MANAGEMENT AND ASSESSMENT OF PAIN IN HEMOPHILIA PATIENTS

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Background and aims

Patients with hemophilia (PwH) may suffer acute pain from haemarthroses and chronic arthropathic pain. Little is known about the treatment of pain in PwH. The aim of the study is to measure the epidemiology, intensity and effectiveness of pain treatment in hemophilia patients.

Methods

An online survey was conducted among 46 PwH. The survey comprised of PainDETECT Questionnaire (PDQ) and questions about epidemiology and intensity (NRS score) of pain, pharmacotherapy and concomitant diseases.

Results

Chronic hemophilic arthropathy pain was reported by 35 (75%) respondents with a NRS intensity of ≥ 5 in 69% . They were treated with paracetamol (n=10), traditional NSAIDs(n=14) and opioids (n=9). Acute pain related to haemarthroses occurred in 91% (n=42) with a NRS intensity of ≥ 5 in 35 patients(83%) .Treatment mainly consisted of paracetamol and traditional NSAIDs. None received transdermal NSAIDs, only 1 COX-2 inhibitors and 12 patients took opioids. Based on the PDQ, a neuropathic pain component is probable in 33 % of PwH. For better pain relief, 22% used either alcohol, marijuana or an overdose of analgesics. Hepatitis C and hepatitis B are reported in 43% and 7% of PwH respectively, the majority of whom were chronically treated with the maximum daily dose of paracetamol. In 50% of PwH, analgesia was insufficient. Only 3 respondents regularly visited a pain clinic.

Conclusions

1. Pain in PwH is poorly controlled and treated inadequately.
2. A potential group of PwH with neuropathic pain should be urgently identified.
3. There is a need for a structured multidisciplinary pain care program for PwH.

EFIC5-0389

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

THE NORDIC MUSCULOSKELETAL QUESTIONNAIRE: CROSS-CULTURAL ADAPTATION INTO TURKISH AND PSYCHOMETRIC EVALUATION

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Background and aims

The Nordic Musculoskeletal Questionnaire (NMQ) is widely used standardized questionnaire allowing comparison of musculoskeletal symptoms (ache, pain, discomfort) for use especially in epidemiological studies. Despite the wide use of the NMQ in clinical studies in Turkey, the cross-cultural adaptation and psychometric evaluation has not been done yet. The aim was to linguistically and culturally adapt the NMQ for its use in Turkey, and to examine the reliability and validity of this adapted version.

Methods

The cross-cultural adaptation was performed by translation of the items from the original version, back-translation by independent mother-tongue translators and committee review. All the participants were healthcare staff. Reliability (internal consistency and test-retest) was examined on 198 participants who filled the NMQ twice with one week interval. The validity was examined on 126 participants from the same population and they filled another four questionnaires related with all body regions described in the NMQ.

Results

The internal consistency was excellent with the Cronbach's alpha of 0.896. The test-retest reliability was examined with the prevalence-adjusted bias-adjusted kappa (PABAK) and most of the items showed adequate reliability (PABAK>0.60). The results of Kendall's tau-b correlation coefficient demonstrated the all NMQ items had correlations with the other related questionnaires ($p<0.001$) which indicates the NMQ had a good validity.

Conclusion

The Turkish version of NMQ provides considerable evidence about its appropriate psychometric properties including test-retest reliability, internal consistency and construct validity. It can be used for the screening and epidemiological investigation of musculoskeletal symptoms.

PAIN AND NON-ADHERENCE WITH MEDICAL TREATMENT IN INDONESIAN WOMEN WITH BREAST CANCER

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Background and aim: Non-adherence with medical treatment can have a negative impact on the patient's recovery. As pain is one of the most feared and burdensome symptoms in cancer, it is a prominent drive for seeking medical help. The aim of the study was to evaluate the association between pain and non-adherence with medical treatment in Indonesian women with breast cancer.

Methods: One hundred and twenty female breast cancer patients who were treated at the Outpatient Surgical Oncology Clinic in Hasan Sadikin Hospital in Indonesia were asked to complete a standard socio-demographic form, the Distress Thermometer, the Problem List and the Treatment Non-adherence Questionnaire.

Results: Pain was the most physical problem on the problem list reported by the patients (71%). Out of 120 participants, 19 (15.8%) were categorized as non-adherers because they had missed two or more treatment sessions, consecutively. Contrary to our expectation, we found no significant association between pain and treatment non-adherence ($\chi^2 = 0.089$, $df = 1$, $p = .766$). Patients who experienced pain had a higher distress score compared to those who did not ($t = -3.987$, $p = .001$).

Conclusions: Pain was found to be the most frequent problem experienced by Indonesian women with breast cancer, however the presence of pain was not associated with a better treatment adherence

EFIC5-0409

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

VALIDITY AND RELIABILITY OF THE CHRONIC PAIN ACCEPTANCE QUESTIONNAIRE IN TURKISH

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Background and Aims: Acceptance of pain involves living daily life despite the pain and giving up trying to control it. The aim of this study was to examine the validity and reliability of the Chronic Pain Acceptance Questionnaire (CPAQ) in Turkish.

Methods: Sample of the research was composed of 201 subjects who referred to Ege University Faculty of Medicine, Department of Algology with non-cancer chronic pain. Patient information form, Turkish version of the CPAQ and Turkish version of the Brief Pain Inventory (BPI) were used as data collecting tools. CPAQ is a two factor, heptamerous Likert type scale with 20 items. Translation and back-translation was performed for language equivalence. Content validity was established by 6 specialists, and factor analysis was performed to test construct validity. Cronbach α coefficient, item-total correlation, split-half reliability and test-retest technics were used to evaluate the reliability. Test-retest reliability was investigated by completing the scale twice, 2 weeks apart by 30 subjects.

Results: Content validity was analysed with Kendall Consistency Coefficient and found to be compatible ($W(a)=0,593$, $p=0,000$). Cronbach α was 0,94 for the total scale. Item-total correlation coefficients were determined between 0,472 and 0,794; so none of the items were deleted. Test-retest correlation was significant ($r=0,887$). Exploratory factor analyses yielded a 2-factor solution as in the original form (Activity engagement and pain willingness). A negative significant correlation between the CPAQ and BPI points was established.

Conclusions: The Turkish version of the CPAQ is a valid and reliable method for measuring chronic pain acceptance in Turkish society.

ASSOCIATIONS BETWEEN PAIN FEATURES AND HEALTH-RELATED QUALITY OF LIFE. A HEAD-TO-HEAD COMPARISON BETWEEN DIFFERENT PAIN PHYSIOPATHOLOGICAL TYPES*C. Pérez¹, C. Margarit², R. Gálvez³, I. Sánchez-Magro⁴, A. de Antonio⁴*¹*Pain Clinic, Instituto de Investigación Sanitaria Hospital Universitario de la Princesa, Madrid, Spain*²*Pain Clinic, General University Hospital of Alicante, Alicante, Spain*³*Pain Clinic, Hospital Virgen de las Nieves, Granada, Spain*⁴*Medical Department, Grünenthal Pharma S.A., Madrid, Spain*

Background and Aims: Health-related quality of life (HR-QoL) has been seldom compared within the same study among patients with chronic pain of diverse physiopathology. We made a head-to-head comparison of HR-QoL, interference, anxiety and sleep between patients with predominantly nociceptive, predominantly neuropathic and mixed pain conditions.

Methods: Data from 1025 patients was collected at 88 pain clinics within Spain. Pain clinicians established the predominant pain physiopathological type in each patient. Patients completed HR-QoL (EuroQol 5-Dimensions, EQ-5D), interference, affective and sleep measures, together with a scale on the level of pain that they considered acceptable. Multivariate analyses were used to evaluate the correlates of HR-QoL measures.

Results: All patients reported very low HR-QoL scores. They were lowest in patients with mixed pain. Patients with nociceptive pain had significantly lesser pain, interference with daily function, anxiety and fewer sleep problems. There were differences in individual items of the instruments employed. The differences of HR-QoL disappeared when adjusted by other variables.

Conclusions: Pain features, in particular intensity, have greater impact on HR-QoL than pain physiopathology.

	Nociceptive- (N=328)	Neuropathic- (N=319)	Mixed- (N=378)	p- value
EQ-5D index score	0.37 (0.21)	0.36 (0.22)	0.33 (0.21)	0.067
EQ-5D VAS score	43.6 (20.4)	42.2 (21.4)	41.4 (20.6)	0.281
Average pain severity	6.4 (1.3)	6.7 (1.4)	6.6 (1.3)	0.068
Least 24-h pain severity	4.7 (1.9)	5.2 (2.0)	5.2 (2.0)	0.006
Interference with daily function	7.1 (2.0)	7.3 (2.1)	7.5 (1.8)	0.080
Anxiety score	8.5 (4.2)	9.6 (4.9)	9.7 (4.5)	0.001
Sleep problems index	46.8 (20.4)	52.2 (21.4)	50.2 (21.6)	0.005
[means (SD)]				

EFIC5-0438

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

REAL-TIME ELECTRONIC CLINICAL OUTCOMES AND RESEARCH DATABASE FOR PAIN (RECORD-PAIN)

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Background and Aims

Clinicians rely on subjective reports of pain from patients to guide management. However, it is difficult to quantify dynamic changes in pain via infrequently administered questionnaires. Web-based electronic diaries can potentially capture changes in pain over time, but their design is not informed by clinicians and patients. RECORD-Pain is a project led by researchers, clinicians and patients. It aims to design, develop and trial a 'cloud-based' database that accepts inputs from a variety of devices logging data from individualized 'pain scales'.

Methods

The RECORD-Pain project consists of three phases. (1) Patient focus groups commented on issues of pain measurement and the proposed e-diary. (2) A beta version of RECORD-pain will be trialed in research studies that involve a wide range of patients with chronic non-cancer pain, with a focus on usability. (3) RECORD-Pain will be integrated into the local electronic health record and administrative network (<http://www.my-ehospital.org/>) to allow pilot work in the clinical environment.

Results

To date, patient focus groups suggest that RECORD-pain would need to include both fixed and customisable self-reported pain scales to cater for different preferences. A beta version of RECORD-pain is under construction (<https://cu.h.fatfractal.com/record>), and when completed would be subject to further feedback from focus groups comprising patients (and their representatives), before being trialed formally in patients.

Conclusions

Initial focus group discussions indicate that RECORD-pain is a viable system for capturing pain reported using individualized scales. However, the various communication platforms offered in the system need further optimisation through larger research studies.

EFIC5-0481

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

PAIN EXTENT, PAIN INTENSITY, AND SLEEP QUALITY IN ADOLESCENTS AND YOUNG ADULTS

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Background and aims: Poor sleep quality is a common and serious problem for young people with chronic pain. An understanding of the factors that impact sleep quality in this population is needed in order to develop effective treatments. The aim of this study was therefore to better understand the roles that pain intensity and pain extent may have in the overall sleep quality in adolescents and young adults with acute and chronic pain.

Methods: A total of 414 young people aged 12 to 24 (44% with chronic pain) provided information about their sleep quality, pain intensity and pain extent. We performed a hierarchical regression analysis with sleep as the dependent variable and pain intensity, extent, age and pain chronicity as predictors.

Results: Pain extent and pain intensity made significant and independent contributions to the prediction of sleep quality, with pain extent being more important ($\beta_s = 0.23$ [$P < 0.001$] and 0.14 [$P < 0.01$]). Young adults reported poorer sleep than adolescents ($\beta = 0.13$, $P < 0.01$). Two significant interactions emerged: Age X Intensity ($\beta = 0.39$, $P < 0.05$) and Chronicity X Intensity ($\beta = 0.88$, $P < 0.001$).

Conclusions: The findings suggest that in order to help young people with pain improve their sleep, they should be taught strategies for dealing with the effects of both pain intensity and extent on sleep, and that doing so earlier (i.e., before the pain becomes chronic, and when they are younger) may enhance the overall efficacy further.

EFIC5-0499

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

VIEWING BEING TOUCHED MAY BIAS THE RESULTS OF ASSESSMENTS PROCEDURES. A CROSSMODAL ATTENTION EXPERIMENT.

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Background and aims. During medical examinations, doctors regularly investigate the integrity of the somatosensory system, using medical tools (e.g. Von Frey hairs, algometer). Often patients view the tool approaching and contacting their body. It is assumed that the obtained results reflect processes in the somatosensory system. However, evidence from crossmodal spatial research revealed that sensory experiences in one modality (e.g. touch) can be influenced by concurrent information from other modalities (e.g. vision), especially near to the body (i.e. peripersonal space). Hence, we hypothesized that seeing someone approaching your body could alter tactile sensitivity in that body-part.

Methods. In a tactile signal-detection task, 23 healthy participants detected and localized threshold-level vibrotactile stimuli administered on the hands (= tactile target). Stimulation was always preceded by the experimenter approaching one of four small metal contact plates with a pen-like object (= visual cue). Two 'close' plates were positioned between thumb and index finger of the participant's hands and two 'far' plates were placed 50cm in front of the close plates. Detection accuracy was calculated for congruent (cue and target on same side) and incongruent (cue and target on opposite sides) trials.

Results. As expected, tactile accuracy was higher in congruent trials, compared to incongruent trials, but only in peripersonal space ($\chi^2(1) = 17.85, p < 0.001$).

Conclusions. Evidence was found for crossmodal integration between visual and tactile information in peripersonal space. These results suggest that somatosensory evaluations – both medical or research-based – could be biased by viewing an object approaching the body.

EFIC5-0513

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

RELATIONSHIP BETWEEN PAIN AND WORK-RELATED OUTCOMES IN A TRIAL OF TAPENTADOL, OXYCODONE OR PLACEBO IN CHRONIC LOW BACK PAIN

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Background and aims: Chronic low back pain (CLBP) is common and associated with significant time off work. However, few data exist on work-related outcomes in pain trials. It is unclear to what extent pain and work-related trial outcomes are congruent, i.e. if benefit in both domains occurs in the same individuals. We aimed to investigate this using data from a randomised controlled trial (RCT) in CLBP.

Methods: Post-hoc individual patient data analysis of a 15-week-long, double-blind RCT in CLBP (NCT00449176) comparing tapentadol extended release (ER) 100-250mg bid, oxycodone controlled release (CR) 20-50mg bid and placebo. We analysed pain intensity (0-10 scale) and interference with work (SF-36 question 8).

Results: Of 981 randomised patients (all treatment groups), 446 completed 15 weeks of treatment and had data available for pain intensity and interference with work. Overall tapentadol ER performed better than oxycodone CR for pain responder outcomes. Analysing subjects from all treatment groups together, patients not experiencing pain improvement but worsening during the trial experienced no improvement in interference with work (3.72 ± 0.77 to 3.41 ± 0.95 , scale 1-5, $n=32$, $p=0.16$). In contrast, those experiencing $\geq 50\%$ reduction in pain intensity also had substantial benefit in interference with work (3.60 ± 0.83 to 2.00 ± 0.82 , $n=161$, $p<0.0001$). In-between pain improvements (0-<15%, 15-<30%, or 30-<50%, together $n=253$) were associated with intermediate improvements in work. Patients with $\geq 50\%$ reduction in pain and an end-of-trial pain score $\leq 3/10$ experienced even more benefit in work (3.51 ± 0.80 to 1.89 ± 0.75 , $n=126$, $p<0.0001$).

Conclusions: Good agreement exists between pain intensity and interference with work as outcomes.

EFIC5-0523

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

DEVELOPMENT OF A SITUATIONAL, FORCED-CHOICE QUESTIONNAIRE OF COPING WITH PAIN: THE SITUATIONAL COPING QUESTIONNAIRE (SCQ)

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Background and aims. Coping theory states that coping is situational. Yet, current assessments of coping are non-situational. Also, the labels used by rating scales (e.g., “very true of me”) in current measures of coping can be interpreted idiosyncratically. Forced-choice formats have a beneficial effect on criterion validity when compared to rating scales. Despite this, to the best of our knowledge forced-choice formats have not been used in health research. The goal of this research was to explore the usefulness of combining a forced-choice format and situational assessment in a health context. **Methods.** The three coping strategies proposed in the SPSI (e.g. problem-focused, avoidant and impulsive) were used for the development of the SCQ. 125 pain patients were required to rank their coping strategies in 38 different situations in which pain was present. Results were compared with non-situational coping rating scales (SPSI and CSQ) for construct validity. Measures of pain intensity (BPI) and health (SF36) were included for criterion validity. **Results.** Coping styles were relatively consistent across situations, but they did not correlate with the SPSI. Significant associations appeared with coping self-statements and ignoring pain (CSQ). The strength of the relation between coping and health differed across situations. **Conclusions.** Coping appears to be stable in different contexts (trait theory), but this might be due to the existence of a common stressor (pain). The influence of coping on health might be context-dependent. Also, situational coping in relation to a specific stressor (e.g. pain) might differ from general coping. Clinical implications are discussed.

EFIC5-0608

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

DEFINING MILD, MODERATE, AND SEVERE PAIN IN YOUTHS WITH PHYSICAL DISABILITIES

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Objective: To identify the cutoffs that are most suitable for classifying average and worst pain intensity as being *mild*, *moderate*, or *severe* in this young people with physical disabilities.

Methods: A convenience sample of 113 young people (mean age = 14.19; SD= 2.9; age range: 8-20) with physical disabilities (namely, spinal cord injury, cerebral palsy, spina bifida, limb deficiency (acquired or congenital), or neuromuscular disease).

Results: A non-linear association between pain intensity and pain interference is found. Optimal cutoffs for average and worst pain intensity differed. For average pain, the best cutoffs for classification were: 0-2 for mild, 3-5 for moderate, and 6-10 for severe. Whereas the optimal classification for worst pain was 0-3 for mild, 4-6 for moderate, and 7-10 for severe.

Conclusions: These results provide additional important information to empirically support decisions as how clinical guidelines for pain treatment ought to be used. Our results show similarities and differences with available information, and more importantly they highlight the need of using cutoffs for young people different from those already suggested for adults with different chronic pain problems. Our data also suggest a similarity of the effects of pain on functioning in individuals with disabilities across age groups. Furthermore, our results suggest that cutoffs for this specific population might be lower than for other persons with chronic pain but no physical disability.

EFIC5-0629

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

ASSESSING PAIN ANXIETY IN ADOLESCENTS: FURTHER EVIDENCE FOR THE UTILITY OF THE CHILD PAIN ANXIETY SYMPTOMS SCALE

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Background and aims: Emotional responses to pain are known to play an important role in the development and maintenance of pain. In order to better understand the role that pain anxiety plays in chronic pain, as well as to evaluate treatments that might effectively treat it, reliable and valid measures of pain anxiety are needed. Thus, the aim of this study is to provide additional evidence regarding the psychometric properties of the Child Pain Anxiety Symptoms Scale (CPASS) in a sample of adolescents.

Methods: 357 adolescents aged 12 to 19 completed measures of pain anxiety (CPASS), catastrophizing about pain (PCS-C), anxiety sensitivity (CASI), sleep quality (NRS-Sleep) and maximum pain intensity in the last three months (NRS-11). We used a Confirmatory Factor Analyses (CFA) to evaluate the factor structure of the items. We also tested the reliability and validity of the scores obtained with the CPASS.

Results: CFA suggested a 4-factor structure with a higher order factor (CFI= .91, TLI= .95, RMSEA= .078). The total score of CPASS showed good internal consistency ($\alpha=.87$) and adequate validity as evidenced by (1) moderate to high correlations between CPASS-PCS-C ($r=.74$, $p<.001$) and CPASS-CASI ($r=.48$, $p<.001$); (2) the magnitude of the correlations between CPASS-PCS-C and CPASS-CASI being significantly greater than that between CPASS and NRS-Sleep ($z= 14.70$ and 8.96 , respectively; $p<.001$), and (3) significant and positive correlations between CPASS and the maximum pain intensity ($r=.24$, $p<.001$).

Conclusions: The findings support the reliability and validity of the scores obtained with the CPASS.

EFIC5-0640

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

THE COMBINATION OF SOME VARIABLES RELATED TO PATIENTS WITH CHRONIC PAIN COULD PREDICT THE PAIN INTENSITY

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Background and aims:

1. To analyze the existence of combination of pain patients variables that could predict the intensity of pain.
2. To study the relationship between pain intensity and variables: age, quality of life, sleep and psychopathology in patients with chronic pain.

Methods:

This is a prospective study about 1408 patients interviewed for the first time in our pain unit. For our study we evaluate:

- Pain score (VAS-average 24 h) with BPI questionnaire
- Age
- Anxiety (HAD-A) and Depression (HAD-D) with HAD questionnaire
- Quality of life: PCS (physical summation) and MCS (mental summation) with SF-12 questionnaire
- Sleep disorder with BPI questionnaire
- Disability index in patients with spine pain with Oswestry questionnaire

We analyzed the relationship between VAS-24 h and the pain related variables with Pearson correlation coefficient and multiple linear regression

Results:

The combination of the variables age, HAD-anxiety, sleep disorder and disability index could predict about 23% variability of VAS-24 h ($r = 0.482$, $p < 0.001$)

All variables studied are significantly correlated with VAS-24 h. ($p < 0.001$)

Conclusions:

This study shows significant correlations between VAS-24h and Disability index, HAD-depression, sleep disorder, MCS, HAD-anxiety, PCS and age.

The combination of the variables age, HAD-anxiety, sleep disorder and disability index is the best predictor of pain intensity on a sample of 1408 patients.

EFIC5-0661

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

LOCUS OF CONTROL AND PAIN: THE UTILITY OF THE MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL SCALE-FORM C (MHLC-C) IN ADOLESCENTS

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Background and aims: Pain beliefs and attitudes are important factors in the development and maintenance of pain problems in young people. Specifically, health locus of control has been suggested to play a key role in how young people cope with and adjust to their pain. The objective of this study was to evaluate the factorial structure and validity of the Form C of the Multidimensional Health Locus of Control Scale (MHLC-C) in a sample of adolescents reporting pain.

Methods: A total of 363 adolescents who had experienced any significant pain in the previous 3 months were included in this study. Participants' completed the MHLC-C and measures of pain-related self-efficacy, anxiety, and coping strategies.

Results: The Confirmatory Factor Analyses indicated an adequate fit of the four-factor model ($\chi^2(128)=283.93$; $p<0.05$).

Conclusions: The results supported the validity of the scores provided with the MHLC-C, which can be readily used in adolescents with pain.

EFIC5-0677

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

ASSESSING USEFULNESS OF A 'SELF REPORTED OUTCOME MEASURE QUESTIONNAIRE' IN A UK UNIVERSITY HOSPITAL

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Aim and Background: To analyze the usefulness of a novel 'self-reported outcome measure questionnaire' following interventional pain procedures. Changes to the pain service delivery model in our hospital have resulted in difficulties in the follow up of patients after pain procedures. We devised a cost effective outcome measure questionnaire to enable follow up of these patients.

Method: As shown in the figure, the devised tool is a simple measuring scale with a spider-chart design. It uses four linear scales (0 -10 points) to measure pain, sleep, activity level and mood. These 4 parameters were chosen as surrogate markers for quality of life (QOL). Data was collected prospectively. The novel questionnaire was completed by the patient at the time of the intervention and 12 weeks after the procedure. After completion, the paper-based forms were returned by post. Findings from the first 65 responses were collated for this abstract.

Results: 42/65 patients reported improvement in QOL following pain clinic intervention; 17/65 did not experience any change and 6/65 reported reduction in the QOL after the intervention.

Discussion: This measuring tool has enabled timely assessment of outcome following interventions and demonstrated effectiveness of our service. In addition, the simple formatting of the questionnaire has made it easy to assess improvements in quality of life helping in the planning for further care. There are some limitations to this assessment tool. The methodology relies on patients' commitment, understanding and compliance for return of these questionnaires.

Pain outcome measure

SB, UHCW

I.D. Male / Female Age Date

Diagnosis: Intervention

Pain

Mood

Sleep

Activity

Best worst Best Best

O (circle) the score before the treatment

X (cross) the score after the treatment

Comments:

Please mail to:
Outcome, Pain Service, Anaesthesia Dept., UHCW NHS Trust, Coventry CV2 2DX

EFIC5-0724

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

VALIDITY OF THE 15D HEALTH-RELATED QUALITY OF LIFE MEASURE IN CHRONIC PAIN PATIENTS

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Background and aims

Health-related quality of life (HRQoL) has gained attention as a comprehensive way to evaluate treatment outcomes. Our aim was to study the validity of the HRQoL instrument 15D in chronic pain patients and to describe the dimensions of health most markedly affected by chronic pain.

Methods

1425 chronic non-malignant pain patients referred to a tertiary pain clinic in 2004-2012 completed the 15D HRQoL survey. In addition, data were collected from the pain clinic's standard clinical questionnaire (e.g. pain intensity VAS:s). The validity of the 15D was assessed by comparing and correlating the 15D results with the results obtained from the clinical questionnaire. In addition, the 15D results were compared with those of a sample of age- and gender-standardized general population.

Results

The 15D scores correlated well with VAS on fatigue, and with pain-associated burden (Spearman's rho -0.427 and -0.493, respectively). Pain intensity VAS correlated with the 15D dimension of discomfort and symptoms (rho=0.462). The 15D dimension of depression correlated with fatigue (rho=0.421), but less with pain intensity and pain-associated burden (rho=0.225 and 0.288). Compared with the population, the mean 15D score of chronic pain patients was markedly lower (0.710 vs. 0.922). The most affected dimensions were discomfort and symptoms, depression, distress, vitality and sexual activity.

Conclusion

The 15D scores correlate well with the widely-used clinical questions and thus indicate validity of the instrument. Furthermore, the different dimensions of the 15D appear discriminative and the instrument valid for the assessment of treatment outcome in chronic pain patients.

EFIC5-0744

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

ANXIETY, DEPRESSION AND INEFFECTIVE HEALTH MAINTENANCE AMONG PATIENTS TREATED IN A PAIN UNIT FOR CHRONIC NONCANCER PAIN

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In its definition of pain, the International Association for the Study of Pain reflects the importance of the sensory, cognitive and motivational dimension. Nurses, from their training to adopt a holistic approach to the person and to promote patients' self-care, autonomy and personal welfare, play a fundamental role in the evaluation and management of chronic pain in a hospital pain unit. The aim of this study is to describe levels of anxiety and depression and the presence or absence of the nursing diagnosis 'Ineffective health maintenance' in patients treated at a chronic pain unit.

Method: Descriptive cross-sectional study carried out from July-December 2014 at Hospital Costa del Sol (Marbella, Spain). Variables: sociodemographic, pain intensity (EVN), anxiety (GAD-7), depression (PHQ-9) and 'Ineffective health maintenance' (GIPS3 indicator of nurses' clinical judgment, constructed from nursing outcomes classification). Descriptive analysis. Student's t-test was used to assess the outcome variables PHQ9, GAD and GIPS3 versus independent dichotomous variables (statistical significance $p < 0.05$).

Results

		Overall		PHQ9			GAD			GIPS3		
		n	%	Mean	SD	p	Mean	SD	p	Mean	SD	p
TOTAL		80	100	13.5	5.7		11.9	5.5		8.9	2.6	
Sex	Man	23	28.8	11.4	6.5	0.63	12.0	5.3	0.123	8.3	2.5	0.218
	Women	57	71.3	12.1	5.1		14.1	5.8		9.1	2.6	
Age	Mean - SD	52.6	10.9			0.111			0.839			0.882
	<=55	42	52.5	10.9	5.3		13.2	6.4		8.8	2.8	
	>55	38	47.5	12.9	5.6		13.8	4.8		8.9	2.4	
Months with pain	Mean - SD	81.9	93.0			0.847			0.907			0.042
	<=48	42	52.5	12.0	5.7		13.4	5.8		8.3	2.8	
	>48	38	47.5	11.7	5.4		13.6	5.6		9.5	2.3	
Pain at rest	Mean - SD	6.1	2.6			0.088			0.021			0.053
	<=7	36	45.0	10.7	5.8		11.9	5.2		9.5	2.4	
	>7	44	55.0	12.8	5.1		14.8	5.8		8.4	2.7	
Pain movement	Mean - SD	7.8	2.1			0.231			0.046			0.071
	<=7	21	26.3	10.6	4.8		11.4	4.7		9.8	2.9	
	>7	59	73.8	12.3	5.7		14.3	5.8		8.6	2.5	

Conclusions: Patients consulting for chronic pain often experience high levels of anxiety, proportional to the intensity of pain. Patients with a longer clinical history better manage their health. Nurses must address these dimensions in order to minimise anxiety, using relaxation techniques and psychoeducation, promoting behaviour by which patients can properly manage their own health, and minimising the time needed to achieve this.

EFIC5-0762

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

EVALUATION OF THE MCID FOR SF-BPI USING DATA FROM THE PIVOTAL LOW BACK PAIN TRIAL FOR TAPENTADOL

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BACKGROUND and AIMS:

Disease specific patient reported outcomes (PRO) are becoming increasingly important in health care decision making. However information about how patients value the impact of interventions for the treatment of severe chronic pain is limited. The objective of this study was to generate information on a minimal clinically important difference (MCID) of the brief pain inventory short form (SF-BPI) for a population with severe low back pain (LBP). Source data were derived from a pivotal trial with 958 patients treated with tapentadol, oxycodone, or placebo.

METHODS:

Using the validated 7-point measure of the patient's global impression of change (PGIC) as an anchor an MCID for the SF-BPI total score index was derived by a receiver operating characteristic (ROC) method for patients who reported minimally improved or better on the PGIC questionnaire.

RESULTS:

A decrease from baseline on the SF-BPI index with a value of 1.7 was derived from the pivotal trial data. This value is consistent with a previously investigated MCID value for SF-BPI in a mixed population with different neuropathic pain indications and LBP.

CONCLUSIONS:

The anchor-based method has led to an MCID of 1.7 for a change from baseline to the end of treatment on the SF-BPI index for patients with severe chronic LBP. Although originally created for cancer pain the SF-BPI can result in reliable results on pain severity and patient's functioning as shown in this large low back pain study.

EFIC5-0807

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

IMPACT OF CACHEXIA AND PAIN ON OTHER SYMPTOMS IN GASTROINTESTINAL CANCER PATIENTS

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Background and aims: To analyze the impact of cachexia and pain on other symptoms experienced by cancer patients.

Methods: Cross-sectional study, 378 adults with gastrointestinal cancer, recruited from 2013 to 2014. Were eligible those with ≥ 6 years of schooling, KPS $\geq 60\%$, without infection or generalized edema. Patients were divided in four groups: cachexia and moderate-severe pain (C&P), cachexia without pain-mild pain (CmP), without cachexia and moderate-severe pain (wC&P) and without cachexia and without pain-mild pain (wCmP). The 0-10 scale was used to assess all symptoms. By Mann-Whitney test the groups were compared.

Results: Patients were mostly men (55.3%) with mean age of 53 years. Cachexia was observed in 40.5% of patients and moderate-severe pain (>3) in 32.5% of them. Patients with cachexia and moderate-severe pain had more intense ($p<0.05$) fatigue, nausea, anxiety, sleep disturbance, appetite and loss of well-being (6 symptoms). Patients without cachexia and with moderate-severe pain showed more intense ($p<0.05$) fatigue, nausea, depression, anxiety, sleep disturbance, appetite, loss of wellbeing and dyspnea (8 symptoms) than those without pain-mild pain. The presence of moderate-intense pain had impacted negatively symptoms in both groups (with or without cachexia), but this impact was more visible in absence of cachexia, and it was surprising. Perhaps cachexia is such an overwhelming condition that reduces the patients' attention to other symptoms. **Conclusions:** These results showed the role of moderate-intense pain over other symptoms in cancer patients but brought questions about the independently role of cachexia over other symptoms.

CHRONIC POSTSURGICAL PAIN AND QUALITY OF LIFE ASSESSED WITH THE SHORT FORM HEALTH SURVEY 12 IN THE GENDOLCAT STUDYA. MONTES¹, G. Roca², G. VILAGUT³, S. SABATE⁴, J. CANTILLO⁵, J. CANET⁶¹Department Anesthesiology PAIN CLINIC, Hospital del Mar, Barcelona, Spain²Department Anesthesiology PAIN CLINIC, Hospital Germans Trias i Pujol, Badalona, Spain³Health Services Research Unit, IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain⁴Anesthesiology, Fundacio Puigvert, Barcelona, Spain⁵Anesthesiology, Hospital del Mar, Barcelona, Spain⁶Anesthesiology, Hospital Germans Trias i Pujol, Badalona, Spain

Background and Aims: To evaluate the influence of chronic postsurgical pain (CPSP) on quality of life (QOL) assessed with version 2 of the Short Form Health Survey-12 (SF-12).

Methods: A prospective multicentre cohort study was carried out in 23 hospitals. Eligible patients were aged 18 yr or older and undergoing elective hysterectomy, herniorrhaphy, or thoracotomy. To diagnose CPSP we telephoned the patients 3 months after surgery. Those who reported pain were scheduled for a hospital at 4 months to confirm CPSP. QOL was assessed with the SF-12 1 month before surgery and 3-4.5 months after surgery. Data were expressed as mean (SD) physical and mental component summary scores.

Results: We enrolled 2929 patients. CPSP developed in 527 patients (18%). Pre- and postsurgical SF-12 results were obtained from 1176 patients. Table 1 shows the results for the physical and mental summary components. Table 2 shows the decrease in QOL in both components after surgery; the decrease was significant for the physical component in patients with CPSP.

Table 1

	No CPSP 788		CPSP 388	
	Presurgical	Postsurgical	Presurgical	Postsurgical
Physical summary	48.0 (8.9)	46.4 (9.6)	44.7 (10.5)	40.9 (10.9)
Mental summary	53.9 (9.5)	52.8 (10.2)	50.1 (12.0)	49.7 (11.4)

Table 2

	No CPSP 788	CPSP 388	P
Physical summary	-1.6 (10.0)	-3.8 (12.0)	0.005
Mental summary	-1.1 (10.4)	-0.4 (11.4)	0.379

Conclusions: QOL tended to decrease after surgery in all patients but the change was significant only for with regard to physical-component aspects and only in patients who developed CPSP.

EFIC5-0936

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

KNOWLEDGE OF NURSES ON CANCER PAIN IN AN INPATIENT UNIT

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Introduction: In pain management evaluation of nurses is paramount, a call prioritized valuing the complaints, identifying pain in physical, psychological, social and spiritual aspects, seeking methods for assessment and care planning to succeed in pain management.

Objective: To evaluate the knowledge of nurses concerning the management of pain in cancer patients in an inpatient unit.

Methodology: Quantitative research by applying a questionnaire to 20 nurses in an inpatient unit in Brazil on pain management in cancer patients.

Results: The majority of nurses were male, mean age 45 years, with five years the average graduation time. As to the knowledge of nurses, 70% said they know the difference between acute pain and chronic pain, and 45% know as pain assessment instrument the numerical verbal scale (EVN), analog (EVA) and faces, 35% only EVN and faces and yet, only 20% know the EVN. As for the time of reassessment of the patient after relief measure, the majority (80%) made new assessment in 1 hour and finally, when asked about the adverse effects of opioids know 95% and only 5% could not relate.

Conclusion: The nurse plays an important role in the management process of the pain of cancer patients. It is very important to have professional scientific field on pain, impact and how to manage properly, so we can give the patient a safe and effective treatment.

EFIC5-0957

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

QUALITY ASSESSMENT OF PAIN CARE FROM THE PERSPECTIVE OF CHRONIC PAIN PATIENTS'

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Background and aims: The need to involve patients in the assessment of quality of health care is well accepted. In particular, it is important to understand and to take account of chronic pain patients' opinions how he defines good quality pain care. The purpose of this study is from patients' perspective to develop a set of structure-, process-, and outcome related quality indicators (QI) that are suitable for assessment of the pain care.

Methods: Twenty-three quality criteria, for the assessment of pain care, were initiated and carried out by chronic pain patient organisations. In agreement with the patient organisations the quality criteria were transformed into QI's based on: feasibility, implication of the QI to pain practice, and scientific basis (already described as a useful QI for pain care). The QI are allocated into 9 domains.

Results: Out of the 23 quality criteria, 19 QI were formulated: 3 outcome-, 16 process-, and 0 structure indicators. Allocation of the domains: six process domains: continuity of pain care, multidisciplinary of pain care, information & education, participation in pain treatment decisions, pain & rehabilitation, and communication with the practitioner. Three outcome domains: treatment goal, treatment result, and numeric rating scale of the practitioner. All QI with the domains are shown in Table 1.

Conclusion: Consensus is made by patient organisations on quality criteria for the assessment of (chronic) pain care. Process-, and outcome oriented quality indicators were formulated. The next step is to validate these quality indicators in daily pain practice.

Domains of QI		QI from the perspective of chronic pain patients
Process pain clinic	Process QI	1. Waiting time <1 month 2. One contact person for pain patients 3. Cooperation between physicians/health care providers.
Multidisciplinarity		4. Inform patients about multidisciplinarity 5. Inform patients about the consequences of working with a pain team 6. Preliminary pain questionnaire
Information & education		Discuss between patient and physician: 7. Possible cause of the pain complaint 8. Possible treatment results 9. Pros and cons of the treatment 10. Other possible sources of information
Pain- and work rehabilitation		11. Discuss possible consequences for work
Participation in treatment decision		12. Patients satisfying of participating in treatment decision(s)
Contact physician		Patient satisfying (Patient Reported Outcome Measure) about contact physician: 13. Listening, seriously, sufficient time and treatment trust
Treatment goal		14. Reached treatment goal
Treatment result	Outcome QI	15. (tentative) Treatment result
NRS pain care program		16. Patient satisfying (Patient Reported Outcome Measure) about (pain) care program on an 11 point Likert Scale (0-10)

EFIC5-0961

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

SUBLINGUAL FENTANYL TABLETS FOR RELIEF OF BREAKTHROUGH PAIN AND IMPROVEMENT OF HEALTH RELATED QUALITY OF LIFE IN CANCER PATIENTS: PRELIMINARY RESULTS.

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Background and aims. Many patients with cancer suffer from breakthrough pain (BTP) which is associated with patient's distress, anxiety and depression. However, studies on the effect of BTP medication on quality of life are lacking. The purpose of this study was to evaluate pain relief and quality of life outcomes after the introduction of sublingual fentanyl tablets (SFT) into the patient's usual care regimen.

Methods. Multicenter, prospective observation post authorization, open-label study conducted between March and December 2013. The study consisted of a screening visit and four assessments points at 3, 7, 15, and 30 days. Pain intensity, frequency of BTP, onset of pain relief, and adverse events were assessed at each control. Anxiety and depression were evaluated using the validated Hospital Anxiety and Depression Scale (HADS) and health status using the Short Form 12 [SF-12] Health Survey. Eligible patients were adults, opioid-tolerant, with a confirmed diagnosis of cancer that were regularly experiencing episodes of BTP that were partially relieved.

Results. 64 patients completed the study. Average pain intensity achieved significant pain reduction across the study ($p < 0.001$). The most common adverse events included somnolence (16.4%), constipation (11.78%) and nausea (9.38%). HADS showed significant improvement in the depression subscale ($p = 0.005$) and anxiety subscale ($p < 0.001$). Health status improved SF-12 physical component score ($p = 0.002$) and mental component score ($p < 0.001$).

Conclusion. SLF provided significant reduction in BTP intensity. The results of the HADS and SF-12 indicate that pain relief is associated with improvement of health status and enhancement of quality of life.

EFIC5-0997

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

PAIN AND ITS IMPACTS ON HEAD AND NECK CANCER SURVIVORS AFTER SURGERY

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Background and Aims Pain is one of the most distressful problems in cancer patients. However, limited research has explored pain experiences in head and neck cancer (HNC) survivors. Thus, the aims of this study were to (1) explore pain prevalence in HNC patients at least 3 months after tumor and neck dissection surgery; and (2) explore patient-reported pain intensity, pain characteristics and pain interferences in this population.

Methods: We conducted this cross-sectional survey in a medical center in Northern Taiwan. HNC patients who had surgery with neck dissection and at least three months after surgery were assessed by trained clinical trial nurses in HNC Outpatient Department (OPD). Instruments used to assess patients included: (1) Brief Pain Inventory-Short Form (BPI), (2) University of Washington Quality of Life scale (UW-QOL), (3) Short Form Health Survey (SF-12), and (4) background information form. Institute Review Board approval and patients' consent were received before data collection.

Results: A total of 160 HNC patients were recruited and close to 40% of them reporting pain. For those with pain: (1) majority of them reported mild to moderate pain; (2) the highest incidences of pain locations were in neck, shoulder, and head, respectively; and (3) patients with higher pain intensity reported significantly higher pain interference and lower QOL and functions.

Conclusion: Pain is still a problem on about two-thirds of HNC patients after surgery in our survey. Personalized interventions to manage their pain problems would be crucial for improving HNC patients' QOL and related functions.

EFIC5-1016

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

EXAMINING THE ASSOCIATION BETWEEN PAIN SEVERITY AND HEALTH OUTCOMES AMONG EUROPEAN ADULTS WHO HAVE BEEN DIAGNOSED WITH PAIN

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Background and aims: The association between pain severity and health outcomes within pain types is well-established. However, the nature of this relationship across pain types has yet to be fully quantified. Accordingly, the aim of this research was to quantify the association between pain severity and several health outcomes in a large sample of patients diagnosed with some form of pain.

Methods: Responses from patients who had been diagnosed with some form of pain (n= 14,459) were drawn from the 2013 EU National Health and Wellness Survey (NHWS; n = 62,000). Respondents reported their subjective pain severity in the past week on a numerical rating scale (0-10) as well as the Medical Outcomes Study Short Form (SF-36), Work Productivity and Activity Impairment Questionnaire (WPAI), and healthcare resource use in the past 6 months (Healthcare professional (HCP) and Emergency room (ER) visits, hospitalizations). The association between pain severity and health outcomes was examined via a series of regression models controlling for a set of demographic and health-related covariates. Regression coefficients (*b*) are reported.

Results: After controlling for demographics and comorbidities, pain severity in the past week was shown to be significantly negatively associated with Health Utilities ($b = -.022$, $p < .001$) and positively associated with overall WPAI scores ($b = .18$, $p < .001$) and healthcare resource use (Hospitalizations: $b = .13$, $p < .001$; ER Visits: $b = .14$, $p < .001$; HCP Visits: $b = .08$, $p < .001$).

Conclusions: Results suggest that reducing pain severity, in general, could result in a decrease in patients' burden and healthcare resource use across a variety of important domains.
Sponsored by Mundipharma

TO INVESTIGATE THE RELATIONSHIP BETWEEN MUSCULOSKELETAL PAIN, UPPER EXTREMITY FUNCTION AND PSYCHOLOGICAL STATUS IN PATIENTS WITH MASTECTOMY

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Background and aims

Psychological problems, extremity pain and upper extremity function deteriorations occur in patients undergoing mastectomy after postoperative period. Our aim is to investigate the relationship between musculoskeletal pain severity, upper extremity function and psychological status in patients with mastectomy.

Methods

Mastectomy patients who were followed up oncology outpatient clinic, without metastasis, after mastectomy were included in this study. The demographic and social data, details of surgeries and oncology treatment and history of musculoskeletal pain were recorded. Pain was evaluated using a visual analogue scale, upper extremity functions were evaluated using Quick DASH questionnaire and psychological status was evaluated using Beck depression inventory.

Results

37 women (mean age $53,46 \pm 10,13$ years) participated in the study. Participant's pain level was $2,6 \pm 2,08$ (min-max: 0-7,2). 32,4% of patients had no pain. The other patient's pain localizations were 32,4% shoulder-arm and 35.2% neck pain. Patients with mastectomy were slightly depression ($10,54 \pm 3,5$). A positive relationship was determined between the psychological status and the upper extremity functions ($p < 0.01$). We could not find a relationship between musculoskeletal pain, psychological status and upper extremity functions.

Conclusion

Upper extremity functional abilities of patients with mastectomy could affected by psychological condition. We aim to research the factors affecting the upper extremity function patient with mastectomy.

EFIC5-1027

Epidemiology, assessment, organisation of pain treatment: Assessment (Patient Reported Outcomes)

TO INVESTIGATE THE EFFECTS OF PAIN ON PHYSICAL ACTIVITY LEVELS AND QUALITY OF LIFE IN PATIENTS WITH MASTECTOMY

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Background and aims

Our aim is to investigate the effects of pain on physical activity levels and quality of life in patients with mastectomy.

Methods

Mastectomy patients who were followed up oncology outpatient clinic, without metastasis, had pain only shoulder and shoulder plus neck pain were included in this study. The demographic and social data, details of surgeries and oncology treatment and history of pain were recorded. Pain was evaluated using a Visual Analogue Scale (VAS), physical activity levels were evaluated using International Physical Activity Questionnaire Short Form (IPAQ-SF) and quality of life was evaluated using Health Assessment Questionnaire (HAQ).

Results

25 women (mean age $50,96 \pm 8,68$ years) participated in the study. 12 patient had shoulder pain and 13 patient had shoulder and neck pain. Participant's mean pain severity was $3,8 \pm 1,38$ (min-max: 2,1-7,2) according to VAS. Patients physical activity levels were low ($806,68 \pm 446,55$). A positive relationship was determined between the physical activity levels and quality of life ($p < 0.05$). We could not find a relationship between pain, physical activity levels and quality of life.

Conclusion

Physical activity levels affect quality of life positively in mastectomy patients. We plan to research the effects of pain severity on physical activity with a greater number of cases.

ASSESSMENT OF PAIN LEVEL AND METHODS OF COPING WITH PAIN OF THE SAKARYA UNIVERSITY ACADEMICIANS

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Background and aims: This study was to determine the level of pain and coping methods among the academicians of Sakarya University.

Materials and Methods: This study was carried out among 128 academicians, between February-March 2013. Data were collected by a questionnaire which was prepared according to the literature.

Results: 64.8% of the academicians were male, and instructor/research assistant (56.3%) and instructor (43.8%). At the end of a working day, 33.6% of the academicians stated that they rarely had pains, and 31.3% several times a week, 14% once a week, 12.5% said they felt pain every day. According to the severity of pain scale of 10, average pain intensity rate of the academicians was 4.25 ± 1.99 . The mean rate of deskwork duration of the academicians was 6.08 ± 1.97 hours, the mean duration of mobile work was 3.98 ± 2.36 hours. Pain was mostly felt in the lower back (43%), in the foot/leg (42.2%), in the neck (41.4%) and in the head (38.3%). The academicians described the pain as throbbing (30.5%), painful (28.9%), tightener (19.5%), stinging (14.8%), burning (7%) and sharp (6.3%). Methods of coping with pain were massage (39.1%), taking analgesic (38.3%) and 31.3% relaxation (31.3%), walking (31.3%), exercise/sports/dance (23.4%), drawing attention to another direction (15.6%), heating (11.7%), meditation/prayer (8.6%) and music (8.6%). There was no significant difference between methods of coping with pain and level of education, position, age and gender ($p > 0.05$). No significant difference was found between durations of deskwork and mobile work ($p > 0.05$).

Conclusion: After shifts, most of the academicians experienced moderate pain. The pain was respectively in the lower back, feet/legs, neck and head. Massage, taking analgesic, relaxation methods were the most common methods of coping with pain.

EFIC5-0127

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

THE MUSCULOSKELETAL PROBLEMS AND QUALITY OF LIFE AMONG THE ACADEMIC AND ADMINISTRATIVE STAFF AT SAKARYA UNIVERSITY

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Background and aims: The purpose of the study was to determine the impact of musculoskeletal problems affecting the academic and administrative staff at Sakarya University on quality of life.

Methods: The sample of the study consisted of 250 staff members working at Sakarya University during the academic year of 2012-2013. The data collection tools in the study were a questionnaire consisting of socio-demographic characteristics and the Nottingham Health Profile Questionnaire.

Results: The mean age of the participants was 35.61 ± 9.51 , 40% of women, the mean years of working 12.17 ± 9.3 , academic staff was 55.2%. 11.6% chronic disease, 62.8% of the exercise is done 48.8% 7 hours and on the computer at the beginning of the works, and 91.2% of the long period of time to sit connected to the discomfort of living (57.2% of low back pain, 52.8% back pain etc) indicating that the employees were determined. Of the participants 76.8% pain for troubleshooting some applications are doing, and stated that the 54.8% against the computer in a sitting position in the wrong seen. NSP-pain and physical mobility in those with chronic disease and quality of life scores were significantly worse than higher ($p < 0.05$). Sport participation NSP pain, emotional reactions, social isolation areas were found to be significantly worse quality of life ($p < 0.05$). Better quality of life for those with the right front of the computer is the sitting position, the position of those who wrong NHP emotional reaction, sleep, social isolation and physical mobility is worse than the sub-dimensions of quality of life ($p < 0.05$).

Conclusions: It was found that most of the university staff suffered from musculoskeletal problems.

EFIC5-0128

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

KNOWLEDGE LEVEL OF FINAL YEAR STUDENTS OF SCHOOL OF HEALTH ABOUT POSTOPERATIVE PAIN AND ITS MANAGEMENT

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Background and aims: This study was to determine the level of knowledge regarding postoperative pain and its management among the final year students of School of Health at Sakarya University.

Methods: Descriptive and cross-sectional study was carried out with 70 students, between January and February 2013. Data was collected with the Questionnaire on Postoperative Pain and Treatment Knowledge (QPPTK) which was developed by Yava in 2004. Data was evaluated by calculating percentiles and means and was analyzed using the independent samples t-test, ANOVA.

Results: The mean age of students was 22.15 ± 0.98 years, 77.1% of female. The mean QPPTK scores of the students was 18.42 ± 4.70 . The mean sub-dimension of QPPTK scores was Pain Information 7.02 ± 2.13 , Therapy Practice Information 6.98 ± 2.87 and Medication Information 2.75 ± 4.45 . Medication information level of final year students was observed to be low. Between QPPTK total scores of the students and the gender there was statistically significant difference ($t=2.211$, $p=0.030$). QPPTK total scores of the female were significantly higher than males. There was no significant correlation between PATBD total and sub-dimension scores and age ($p>0.05$).

Conclusion: In this study we determined that knowledge levels of the students about postoperative pain and its management were good, but their knowledge levels of medication information were low.

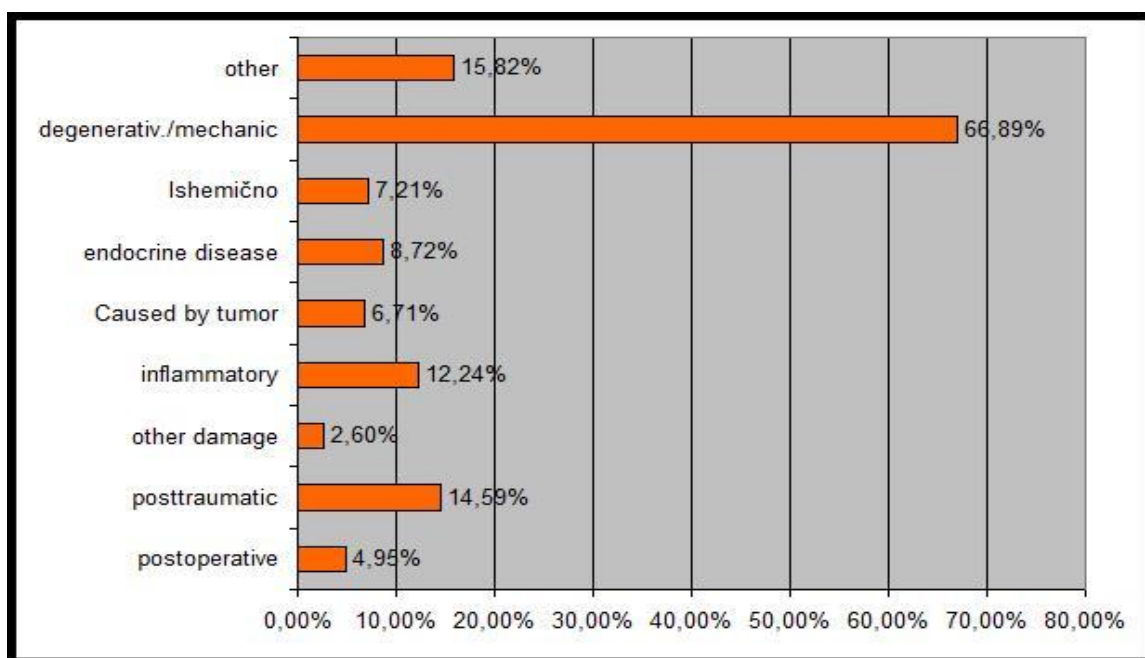
RESEARCH IMPACT OF CHRONIC PAIN ON PSYCHO - PHYSICAL STATE BY B&H POPULATION*A. Karkin Tais¹, S. Marić², E. Djonlić³*¹*Pain, Eurofarm- policlinic, sarajevo, Bosnia and Herzegovina*²*Pain, Clinical Center RS, Foča, Bosnia and Herzegovina*³*Anaesthesiology pain, UKC Sarajevo, sarajevo, Bosnia and Herzegovina*

Aim of Investigation: The aim is to examine how much the chronic pain impact on psycho - physical state and how the resulting on quality of life in BH population.

Methods: Research on epidemiological data of population with chronic pain provided through the series of epidemiological parameters, based on interviews and questionnaires on 500 patients. Analysis included descriptive as well as unvaried analysis comparisons.

Results: In the relationship between the etiologic pathogens causes pain, diagnosis and impact on psycho -physical state, is found that half and two thirds of those suffering were unable to carry out daily activities. In relation to gender, women aged over 50 are limited in larger proportion as compared to men. Difficulty climbing / descending the stairs were present and difficulties in walking.

Accompanying symptoms: Weakness in hand/leg in 78, 88%, other feelings in contact in 48, 70, burning sensation without feeling pain in 35, 21 %. Pain worsens activity, weather and stress.



Level of psychological condition is limited. Depression (anxious) and sleep disorder were present by more than half.

Conclusions: The presence of chronic pain was associated with lower psycho- physical state and has negative impact on quality of everyday life. It is needed to determine data in large populations.

EFIC5-0119

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

COST-EFFECTIVENESS ANALYSIS OF TAPENTADOL PR VS. OXYCODONE/NALOXONE PR FOR THE TREATMENT OF SEVERE CHRONIC LOW BACK PAIN WITH A NEUROPATHIC COMPONENT

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Background and aims

A recent randomized, open-label, phase IIIb/IV trial (ClinicalTrials.gov: NCT01838616) compared tapentadol PR with oxycodone/naloxone PR in patients with severe chronic low back pain with a neuropathic component. The aim was to assess the cost-effectiveness of tapentadol PR compared with oxycodone/naloxone PR based on the comparative clinical study and considering the healthcare payer perspective in Spain.

Methods

A Markov model was developed to assess the costs and benefits over a 1-year time horizon. Patients tolerating the treatment or with mild adverse events remained on therapy. Patients who lacked sufficient efficacy or had poor tolerability switched to a 2nd line strong opioid and later 3rd line therapy. Data regarding efficacy, tolerability and utility values were derived from the comparative clinical study mentioned above and from published literature. Drug costs were based on the official price list from October 2014. Resource use (consultations, co-medication, and hospitalisations) was estimated by an expert panel. Extensive sensitivity and scenario analyses were undertaken to assess the impact of parameter uncertainty.

Results

Mean annual total costs per patient were €2,655 and €2,797 for tapentadol PR and oxycodone/naloxone PR, respectively. Tapentadol PR generated 0.613 quality-adjusted life-years (QALYs) compared to 0.494 QALYs for oxycodone/naloxone PR, resulting in tapentadol PR being a dominant treatment. Results were supported by sensitivity analyses. Probability that tapentadol PR is cost-effective exceeded 90% at any threshold.

Conclusions

Compared to oxycodone/naloxone PR, tapentadol PR represents a cost-effective treatment option for patients with severe chronic low-back pain with a neuropathic component in Spain.

**CHRONIC LOW BACK PAIN AS THE CAUSE OF DISABILITY RETIREMENT –
RELATIONSHIP BETWEEN OPERATIVE AND NONOPERATIVE TREATMENT APPROACH**

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Background and aims:

The aim of this observational study is to analyse the relationship between operative and nonoperative treatment approach in chronic low back pain and its impact on disability retirement in Croatia.

Methods:

Data were collected from Croatian pension register during one year period, 2013. Standard assessment of the capacity for work was done individually for each patient depending on the specific limitation produced by the disease, and according to the profession or current job of the patient. There are two different types of disability pension: complete loss of working capacity for any form of employment and partial loss of working capacity for patient's normal profession or current job, meaning they still have residual working capacity.

Results:

During 2013, 160 patients with chronic low back pain were assessed as having permanent incapacity for work with subsequent disability retirement: 67 (42%) were treated operatively and 93 (58%) were not operated patients. Median age was 53 (range 35-64). Of 93 not operated patients, 9 (9,7%) were assessed as having complete loss and 84 (90,3%) as having partial loss of working capacity. Operatively treated patients were assessed as follows: 12 (17,9%) as having complete loss, and 55 (82,1%) as partial loss of working capacity. There is no significant statistical difference between these two treatment approaches on loss of working capacity (Yates' chi-squared test 1,649; p=0,199).

Conclusions:

There is no difference in operative or nonoperative approach to the treatment of chronic low back pain and subsequent disability retirement in Croatia.

A NOVEL, OBJECTIVE, QUANTITATIVE METHOD OF EVALUATION OF THE PAIN COMPONENT AND PARESTHESIA COVERAGE USING COMPARATIVE COMPUTERIZED MULTIPARAMETRIC TACTILE MAPPING AND DATABASE ANALYSIS: THE N3MT SOFTWARE.

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Background

One of the major challenges of neurostimulation is actually to address the back pain component in patients suffering from refractory chronic back and leg pain. Facing a tremendous expansion of neurostimulation techniques and available devices, implanters and patients can still remain confused as they need to select the right tool for the right indication. To evaluate and compare objectively patient outcomes, depending on therapeutical strategies, it appears essential to develop a rational and quantitative approach to pain assessment and neurostimulation outcomes for those who undergo neurostimulation implantation.

Materials/Methods:

Our neuroinformatics laboratory (N³Lab) located in Poitiers University Hospital, Department of Neurosurgery, enabled us to develop the Neuro-Mapping Tools software (N3MT). This tool consists of touch screen mapping, allowing the patient and/or the physician to interact by means of a tablet computer to delineate painful zones and paraesthesia coverage in the back and legs regions.

Results :

The N3MT (Neuro-Pain'T, the Neuro-Mapping Locator and the Neuro-Data-Base) have been put together and used in more than 190 patients since 2012, leading us to describe new measurement parameters, divided into two categories:

- Technical parameters, evaluating the implanted device itself, as "Device Performance/ X_P ", "Device Specificity/ X_S " and "Persistence of the Paresthesia Perception" on the long term/ X_{P3} .
- Clinical parameters, evaluating patient response to the therapy: pain surface reduction/ Y_S ; pain intensity reduction/ Y_I ; pain characteristics redistribution/ Y_{PC} .

Conclusions: The N3MT software could help to guide tomorrow's treatment options by transforming personal convictions into a more robust scientific rationale based on data collection and data mining techniques.

EFIC5-0156

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

EASY AND FAST DIAGNOSIS OF LOCALIZED NEUROPATHIC PAIN

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Objective

Assess and validate a tool for quick and easy detection, diagnostic Located Neuropathic Pain (DNL) because despite being used (DN43 / pain DETECT / LANSS4) is still underdiagnosed the DN

Method

This proposal tool was tested with primary care physicians Badalona November 2012 to March 2013 and subsequently validated by the Pain reference (Municipal Hospital of Badalona) as directed by the IASP.

Results

2,079 patients (general population with chronic pain) (age: 60.7 ± 11.1 years; women = 69.9%) were visited by 31 GPs. The DNL was diagnosed and validated in 394 patients. (55.3% of patients with DN). Detection, including examination of the patient, said seven minutes (average). Physicians assessed the tool as useful (24/31) or very useful (7/31) that facilitates practice (30/31). The PPV (positive predictive value) / VPN (negative predictive value) was 41% / respectively 89% and very predictive as exclusion for indication. The main causes of DNL were pain lumbar 27%; carpio 22% tunnel; 9.4% CRPS; DN postsurgical 6.9%; diabetic polyneuropathy 5.6%; neck pain 3.8%; other neuropathies. Of which only 22% of patients taking medication for DN based on evidence.

Conclusions:

- This study presents the first diagnostic tool DNL in spanish.
- It is simple and reliable to assess the DNL and strictly adheres to the diagnosis algorithm proposed by the IASP DN.
- In conducting the study in usual practice is unbiased spectrum, so the results are realistic

EFIC5-0173

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

FEASIBILITY OF MONITORING PATIENTS' CANCER-RELATED PAIN VIA THE INTERNET

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Background

In the outpatient setting, pain management is often inadequate, because of patient-and professional-related barriers in communication and infrequent contacts at the outpatient department. The internet provides new opportunities for monitoring these patients.

The aim of this study is to investigate whether internet monitoring is feasible in patients treated for cancer-related pain.

Methods

We developed an internet application (and app) that contained a pain diary, eConsult and a link to patient information about cancer-related pain. In the pain diary, patients scored their pain intensity, side effects and their analgesic use daily. These data were monitored by a nurse specialist. Outpatients with a difficult pain problem were eligible.

Results

We included 68 cancer patients. Thirteen (19%) of them were not evaluable due to language/cognitive problems(2); not having been started because they were too ill(7); withdrawal of participation(2), and internet problems(2). Of the 55 evaluable patients, 40% was male, median age was 61 years (range:25-76). In total, these patients filled in a median of 29 diaries (range:3-247), and asked for a median of 7 eConsults (range:0-58). Analgesics were changed thrice (range:1-11). Patients most frequently used an eConsult for questions about how to use their analgesics and about the side effects.

Conclusions

Internet monitoring of pain is feasible in patients with cancer-related pain. The frequent use of the pain diary in the majority of patients indicates that those patients do not perceive barriers for the frequent assessment of pain and side effects. Especially eConsults were frequently asked, probably enhancing patients' self-management.

SYSTEMATIC USE OF THE ALGOPLUS® SCALE IMPROVES ANALGESICS PRESCRIPTION IN THE EMERGENCY DEPARTMENT (AE) IN ≥ 75 YEARS OLD PATIENTS.

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Introduction

In the Emergency Department (AE), evaluation of acute pain is often difficult in elderly persons with disorders of verbal communication. Pain evaluation by Numerical Scale (NS) is not always possible and a behavioral scale like Algoplus® may be used. This observational study aims to estimate if the systematic use of Algoplus® in AE could change the analgesics prescription.

Methods

The study consisted in 3 periods: Period 1- medical files (for 3 months) of any > 75 y patient admitted in the AE are reviewed; pain evaluation and analgesics prescription are collected. Period 2-the whole AE staff (31 physicians, 42 nurses, 20 health care providers) is trained to use Algoplus®. Period 3- identical to and one year after Period 1. Comparisons between periods are done with statistical significance $p < 0.05$.

Results

Period 1 vs Period 3: 38 % vs 44 % medical files have a prescription of analgesics. 17% have pain evaluation by NS vs 40 % by NS+Algoplus®. 43 % vs 12 % have no evaluation of pain. Data are significantly different ($p < 0.05$ to 0.01).

Conclusion

The systematic use of the Algoplus® scale and the training of the staff in the Emergency Department lead to an increase in analgesics prescription and of overall pain evaluation. Algoplus® use allows a change of practice by improving the detection, the evaluation and the management of pain in the elderly with disorders of verbal communication. Further qualitative and quantitative studies will now be carried out to extend the implementation of Algoplus® in routine practice.

EFIC5-0218

Epidemiology, assessment, organisation of pain treatment: Assessment (Other)

INCIDENCE OF RE ADMISSIONS OF PATIENTS WITH PAIN AND THEIR REFERRAL TO PAIN CLINIC

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Background:

Good quality pain control is important for good quality of life. Though the in-hospital services for acute pain have been satisfactory, reports have shown that large population in the community suffering from chronic pain have limited access to pain services.

Aims:

Reduce the number of re admissions of patients with pain by appropriate planning and referrals to clinic, thereby reducing the cost incurred with these re-admissions.

Methods:

The study involved a period of 2 months involving 42 patients who were admitted under different specialties with non-surgical and non-traumatic pain as their chief complaint.

Data was collected using a pre designed questionnaire.

Due to resource constraint, quantification of costs incurred during these re-admission (hospital stay, pain team visit and resources) was not done.

The data was collected prospectively by patient interview and information from patient's medical records taking verbal consent of the patients (patient identifiable data removed).

Results:

- 100% compliance with early consultant input for all patients and effective multidisciplinary involvement.
- 78% of the readmitted patients were seen by pain team in previous admissions and plan of treatment was made in all these cases but plan not followed in 18.5% patients.
- 70% patients were advised to visit pain clinic during previous admissions of which 18.5% did not attend as they were not communicated with the plan to visit the pain clinic after discharge.

Conclusion:

- Development of formal referral system using a formal referral form for all specialties.
- Formal training of the discharge team for better communication to the patients about the referral.

RESULTS OF LATIN AMERICAN SURVEY “CHANGE PAIN”: NECESSITY OF PROFESSIONAL EDUCATION IN OPIOID CLINICAL PHARMACOLOGY

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Background and aims: There is an underuse of opioid analgesics in severe oncologic and non-oncologic pain in Latin America. It is likely that this is accompanied with poor knowledge of their clinical pharmacology.

Methods: 3002 electronic surveys were performed randomly from October 2012 to October 2014 to general practitioners and specialists through medical associations or conducted in medical congresses of 15 Latin American countries emphasizing the evaluation of the degree of knowledge of opioid clinical pharmacology and utilization of opioid analgesics.

Results: Strong opioids are an important element in severe pain management, but 24.3% of the surveyed physicians reported using them only in less than 10% of their patients with severe chronic pain, 45.7% used them in less than 40% of cases. Even in chronic pain patients, 15.22% of the physicians used opioids only for less than 1 week and 32.7% for less than 1 month. 62.54% of the physicians agree that there is insufficient knowledge about the pharmacological characteristics of the different pain management options. 75% thinks that the presence of adverse effects is a limitation for effective opioid use.

Conclusions: This survey shows the underuse of opioids in severe pain, fear of adverse effects, and that most Latin American physicians think that there is a deficit in knowledge about opioid clinical pharmacology. Education in opioid pharmacology, correct clinical use and strategies in opioid rotation for improving efficacy and reducing adverse effects could be useful to correct opioid underuse in Latin America.

DEFINING EDUCATIONAL GOAL FOR PAIN MANAGEMENT IMPROVEMENT IN EMERGENCY MEDICAL SERVICE

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Background and aim: Earlier studies documented high prevalence of pain and ineffective pain treatment among outhospital patients treated by Emergency Medical Service (EMS). A further professional education programme in pain treatment could make improvement. The aim of this descriptive study is to define an educational goal. The Ferrell and McCaffery Knowledge and Attitudes Survey Regarding Pain was used.

Method: Translated questionnaires were sent to 85 nurses and 65 physicians of EMS Novi Sad. Spreading and collecting of questionnaires was maintained with everyday supplies. They had 39 questions to answer (true/fals, multiple choice). Beside questionnaires, information about years of experience and educational level were used. Descriptive statistics and χ^2 test were used in data analysis.

Results: The 76 (50%) completed questionnaires were sent back (31 physicians and 45 nurses). Mean total score is 60,89%. Eleven questions were answered incorrectly by more than 60% of participants. Six of these questions were related to pain assessment (understanding assessment tools and accepting a patient's self-reporting pain). The five of questions are related to opioid pharmacology and understanding of opioid addiction and dependence. Nurses had significant lower score with questions related to opioid pharmacology. No significant differences were found in mean total scores by education level or years of experience.

Conclusions: A further professional education programme in EMS Novi Sad should include: the pain assessment process, the opioid pharmacology and the opioid addiction.

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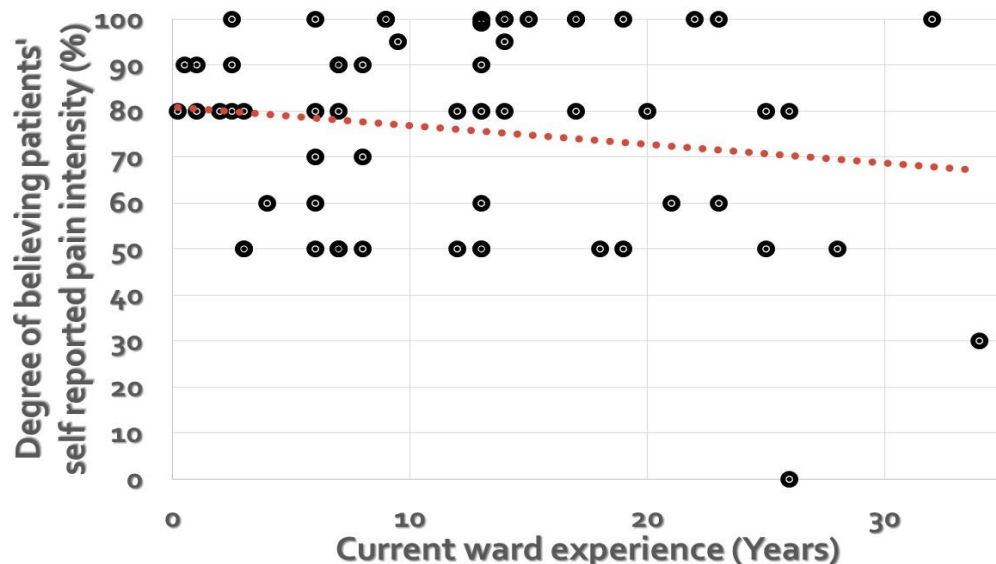
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Methods: 63 nurses (17 males\ 45 females) filled the questionnaire (Toronto pain management inventory, modified) at two different internal wards (C, n=23 and D, n=15) and two supra-internal wards (nephrology, n=13 and dermatology, n=11).

Conclusions: This study shows that more experience and education can work in an inhibitive fashion that may compromise patients' adequate pain management. Further studies are needed in order to validate this study and for the needed plans of intervention for this issue.

Figure 1: Effect of nurses' experience on their attitude for patients self-reported pain intensity



HIGH-TECH SIMULATION TRAINING (HTST) FOR HEALTHCARE PROFESSIONALS WORKING AT THE PAIN CENTER OF THE CENTRE HOSPITALIER DE L'UNIVERSITE DE MONTREAL (CHUM). PRELIMINARY RESULTS

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Background and aims: For the first time in Canada, HTST was tailored for pain health care professionals. This technique was created for anesthesia, surgery, ER, obstetric and pediatric practice. The aim was identify which techniques have a higher risk of complication in our practices, strengthen the importance of teamwork in emergency/complicated cases and give the training to treat complications.

Methods: We elaborated a 4 hours structured workshop: We created three HTST scenarios. We elaborated 2 questionnaires, one to know the participants learnt about the workshop's objectives. The second was given two months later to know if participants had the opportunity to put into practice the knowledge acquired during HTST. We also used a French version the Debriefing Assessment for Simulation in Healthcare (DASH).

Results: To date 13 practitioners, seven women and six men take the training. The age average 25-49 years old. The average year of professional practice was 5-9. The professionals were: three family doctors, three anesthesiologists, one resident in anesthesia and six nurses. The average of DASH short version was: 6.5 / 7.

The questionnaire two month after the HTST showed that 84.61% of the participants have had a positive impact on their medical practice. 92.30% of participants have used at least one to three times the practical knowledge associated to HTST.

Conclusions: The results show that HTST is excellent to consolidate the knowledge acquired and put into practice the importance of teamwork and to recognise techniques with higher risks of complication in a Pain Center.

WHOSE DECISION IS THE BEST DECISION? CLINICAL DECISION MAKING REGARDING THE MANAGEMENT OF PAIN - DIFFERENCES BETWEEN NOVICE AND EXPERT NURSES

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Background: Nursing pain management is closely related to decision making-process. It is generally assumed that education and practical experience increases accuracy in decision-making. The purposes of the study: to identify the cognitive processes used by nurses when making pain management decisions and the factors which have an influence on these processes; to examine the difference between novice and expert nurses, in their decision making about pain management.

Methods: The subjects constitute a non-random sample of 65 registered nurses working in surgical wards in two academic medical centers in Israel. The study is based on three tools: the self-assessment questionnaire of participants' pain management knowledge and skills; vignettes describing common situations which require nurse's decision; script concordance test evaluating decision making in common clinical situations.

Results: The decision regarding pain management of expert nurses were mostly based on their experience and intuition, while novices relied on guidelines or colleagues' advises. In comparison to novice, expert nurses reported that the decision making process was easier for them ($\alpha=0.013$). No association was found between seniority in a surgical ward and accuracy in decision making. The findings were consistent with vignettes and script concordance test.

Conclusions: There is a substantial difference in the decision making regarding pain management between novices and experts, both in quality of the decision and the cognitive process of the decision making. Well-developed guidelines may assist no novice to improve their decision making skills. The script concordance test seems to be an effective tool in evaluating nurses' clinical decisions.

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DEVELOPING A NATIONAL PAIN KNOWLEDGE AND SKILLS FRAMEWORK FOR THE NURSING TEAM.

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BACKGROUND: Pain traverses all clinical settings and the age spectrum yet it is often poorly assessed and managed by nurses. This results in short and long term adverse consequences. The Royal College of Nursing (RCN) is the major professional body for nursing in the United Kingdom (UK). The RCN *Knowledge and innovation action plan for 2014-2018* (RCN 2014) aimed to develop new knowledge and evaluate its impact.

METHODS: Mandated by the action plan, and funded by the RCN, a working party consisting of expert pain educationalists, academics, researchers and specialist nurses from across the UK was convened. A knowledge and skills framework (KSF) was developed. Firstly the career framework (Skills for Health 2010) was mapped against Benner's (1982) levels of practice (novice, advanced beginner, competent, proficient and expert). These two in turn were then mapped against levels of education, training and professional qualification from Care Certificate through to Doctoral studies.

RESULTS: Designed to be used alongside local competency documents, the KSF supports the individual nurse's migration from novice to expert. The content has been split to meet the specific needs of unregistered and registered members of the nursing team with each group having their own document. There is clear progression in the knowledge, practice and experience of nurses working within the framework.

CONCLUSIONS: The KSF improves the understanding and skill set of the wider nursing team and promotes excellence in practice thus improving patient care and outcomes.

PRACTICES OF STUDENTS WHO STUDIED SURGERY COURSE FOR PAIN ASSESSMENT AND MANAGEMENT

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Background-Aims: The aim of this descriptive study was to investigate pain assessment and management practices of students who studied surgery course.

Methods: The research was carried out in January 2015. The study sample consisted of 59 nursing students who wanted to contribute this research and studied surgery course at School of Health, Kırklareli University. A written permission was taken from the concerned authority. Data were collected with a questionnaire which was developed by the researchers. North American Nursing Diagnosis Association-International was used as criteria for nursing diagnosis.

Results: Among the participant students, 81.4% was female and their mean age was 20.9±1.8. 91.5% of the students answered the question 'Do you use any pain scale when evaluating the pain?' as 'yes' and 87.9% of the students said that they registered their application for pain management. 38.3% of the students used pain assessment scale to assess pain and 17.9% of them identified the nursing diagnosis as surgery-related pain. Analgesic drug was the most frequently used practice with the rate of 67.7% and 27.1% of them tried to attract the patient's attention to another aspect.

Conclusion: Most of the students used analgesic drug for pain management instead of non-pharmacological methods, therefore; it has been suggested that more time should be allocated for non-pharmacological methods during nursing education.

DETERMINING POSTOPERATIVE PAIN MANAGEMENT INTERVENTIONS OF NURSING STUDENTS

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Background and aims: Postoperative pain is a common symptom that most patients experience after surgery and nurses play a key role in pain management with assessing pain, administering non-pharmacologic interventions, checking the side effects of pharmacologic treatment, monitoring pain treatment outcomes, etc. This descriptive study was carried out to determine the pain management interventions of nursing students during their second nursing training year.

Methods: The data were collected from students' nursing care plans that they completed during their training between September 2014 - January 2015. Students had their surgical nursing training in the main surgical ward of university hospital and this training took 6 days for each month.

Results: It was found that 61.6% of students used the nursing diagnosis 'pain" and 31.1% of them evaluated pain severity after surgery. Seven students searched the reason of pain and 55.5% administered the medication for the first. Only 6.6% of them observed the side effects of this treatment. Twenty students tried to distract patients by speaking and reading something. Eighty percent of them repositioned their patients and 31.1% of them did massages. Between all students, only 10 of them checked the effect of their interventions and mentioned that pain was decreased after it.

Conclusions: This study showed that students use pharmacologic and non-pharmacologic interventions for pain management. But they rarely check the reason of pain and the effects of the interventions. As known, nursing care planning ends when problem is solved. Evaluating the outcomes of the interventions should be emphasized during the education.