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KNOWLEDGE OF THE NURSING TEAM ON THE PREVENTION AND MANAGEMENT OF EXTRAVASATION OF CHEMOTHERAPY DRUGS

CONHECIMENTO DA EQUIPE DE ENFERMAGEM ACERCA DA PREVENÇÃO E MANEJO DE EXTRAVASAMENTO DE DROGAS QUIMIOTERÁPICAS

CONOCIMIENTO DEL EQUIPO DE ENFERMERÍA ACERCA DE LA PREVENCIÓN Y MANEJO DE EXTRAVASAMIENTO DE DROGAS QUIMIOTERÁPICAS

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ABSTRACT

Objective: to identify the knowledge of the professionals of the Nursing team about the prevention and management of extravasation of chemotherapy drugs during cancer treatment. ***Method:*** a quantitative, descriptive and cross-sectional study with 16 Nursing professionals working in a hospital in the interior of the state of São Paulo (SP), Brazil. A self-administered questionnaire was used, composed of socio-demographic variables, questions about professional practice time, oncological activity time and training on chemotherapy administration. ***Results:*** it was observed that 62.5% of the professionals did not know the order of choice of the peripheral puncture; 12.5%, that chemotherapeutic agents can not be administered to limbs with motor alterations; 43.7%, that increased infusion resistance is an indication of extravasation; 75% are unaware of the use of the hot compress for certain chemotherapeutic agents; and 87.5% reported knowing the institution's extravasation protocol. ***Conclusion:*** there is a need for structuring a permanent education program due to the lack of technical and scientific knowledge about the prevention and management of extravasation by chemotherapeutic drugs. ***Descriptors:*** Nursing; Knowledge; Drug Therapy.

RESUMO

Objetivo: identificar o conhecimento dos profissionais da equipe de Enfermagem acerca da prevenção e manejo do extravasamento de drogas quimioterápicas durante o tratamento oncológico. ***Método:*** estudo quantitativo, descritivo e transversal, com 16 profissionais da equipe de Enfermagem que atuam em um hospital no interior do Estado de São Paulo (SP), Brasil. Utilizou-se um questionário autoaplicável composto por variáveis sociodemográficas, questões sobre o tempo de exercício profissional, tempo de atuação na área oncológica e treinamentos sobre administração de quimioterápicos. ***Resultados:*** observou-se que 62,5% dos profissionais não sabiam a ordem de escolha da punção periférica; 12,5%, que agentes quimioterápicos não podem ser administrados em membros com alterações motoras; 43,7%, que o aumento da resistência da infusão é um sinal indicativo de extravasamento; 75% desconhecem o uso da compressa quente para determinados quimioterápicos e 87,5% referiram que conhecem o protocolo de extravasamento da instituição. ***Conclusão:*** nota-se a necessidade de estruturação de um programa de educação permanente devido à carência de conhecimentos técnicos e científicos acerca da prevenção e manejo do extravasamento por drogas quimioterápicas. ***Descritores:*** Enfermagem; Conhecimento; Quimioterapia.

RESUMEN

Objetivo: identificar el conocimiento de los profesionales del equipo de Enfermería acerca de la prevención y manejo de la extravasación de drogas quimioterápicas durante el tratamiento oncológico. ***Método:*** estudio cuantitativo, descriptivo y transversal, con 16 profesionales del equipo de Enfermería que actúan en un hospital en el interior del Estado de São Paulo (SP), Brasil. Se utilizó un cuestionario auto aplicable compuesto por variables sociodemográficas, cuestiones sobre el tiempo de ejercicio profesional, tiempo de actuación en el área oncológica y entrenamientos sobre administración de quimioterápicos. ***Resultados:*** se observó que el 62,5% de los profesionales no sabían el orden de elección de la punción periférica; 12,5%, que agentes quimioterápicos no pueden ser administrados en miembros con alteraciones motoras; 43,7%, que el aumento de la resistencia de la infusión es un signo indicativo de extravasación; 75% desconocen el uso de la compresa caliente para determinados quimioterápicos; y el 87,5% señaló que conocen el protocolo de extravasación de la institución. ***Conclusión:*** se nota la necesidad de estructuración de un programa de educación permanente debido a la carencia de conocimientos técnicos y científicos acerca de la prevención y manejo de la extravasación por drogas quimioterápicas. ***Descriptores:*** Enfermería; Conocimiento; Quimioterapia.

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INTRODUCTION

One of the most widely used therapeutic modalities in oncology is chemotherapy, which uses chemical agents, alone or in combination, to treat malignant tumors by interfering with the process of cell division. Due to their direct action in the cell cycle, these agents can be toxic to tissues with high mitotic activities, causing several adverse events.[1]

One of these events is extravasation, caused by the unintentional administration of the chemotherapeutic agent or vesicant solution in the perivascular space or in the subcutaneous tissue, being denominated local dermatological toxicity.[2] As the intravenous route is one of the main routes of administration of the chemotherapeutic agents, extravasation is one of the adverse events that of high incidence. This varies from 0.1 to 6%, however, establishing it, accurately, is difficult, due to underreporting of the occurrence by health professionals.[3-4]

As part of the actions to prevent the occurrence of extravasation, knowledge about the classification of drugs is extremely relevant, since antineoplastic agents may be vesicant or irritant, according to the aggressive potential for blood vessels and adjacent tissues.[5-6]

The extravasation of vesicant drugs causes progressive tissue damage and promotes more intense reactions, such as severe irritation, formation of vesicles and tissue destruction. Vesicles and ulcers form after days or weeks of extravasation. The lesions can progress, and necrosis can reach tendons, ligaments, nerves and bones, causing severe pain and functional limb loss.[7]

Irritant antineoplastic agents, on the other hand, cause less intense skin action, causing local inflammatory reaction without causing tissue necrosis.[5-6] Conduct in the event of extravasation of chemotherapeutic agents will depend on the type of drug - vesicant, irritant and non - irritant.

Complications resulting from extravasation depend on the type of chemotherapeutic agent, extravasated amount, concentration, location, and interval between the occurrence of the event, its recognition and treatment.[1-2] Extravasation may cause local reactions, such as skin irritation and, in severe, tissue necrosis, as it affects the skin and the subcutaneous tissue; and more internal structures, such as ligaments and tendons.[8-9] The impairment of these structures can cause functional damage, neurological changes, changes in body image and loss of patient confidence in the health professional.[8]

It is therefore considered, essential that professionals involved in health care should be aware of adverse events and options for management and prevention of extravasation of chemotherapeutic agents.[10]

Among the professionals who provide care to cancer patients, the most important is the nurse, who plays a fundamental role in the prevention, identification and follow-up of the complications of this adverse event. His performance requires up-to-date theoretical and practical knowledge, since it requires the development of skills that can guide his professional performance in an efficient and safe way.[11]

The safety in the process of administration of chemotherapeutic agents is part of the daily routine of Nursing, being their responsibility. In order for this process to be carried out safely, it is necessary that the professionals involved in the care have the knowledge, skills and technical skills that are acquired through clinical experience and through educational actions.[12]

The concern with the prevention and the management of adverse events due to chemotherapy occurs due to the importance of the role of Nursing in the care of cancer patients and the increasing number of diagnosed cases of cancer, and the estimation of new cases in Brazil in the 2016 and 2017, is approximately 600 thousand cases, and, consequently, the demand for treatments that incorporate the administration of chemotherapeutic agents will also increase.[13] In addition, underreporting of the adverse event is indicative of the lack of knowledge of the professionals involved in the care, evidencing a failure in the performance of Nursing during the process of administration of chemotherapeutic drugs.

Thus, the objective of this study was to identify the knowledge of the professionals of the Nursing team, who work with oncology patients in chemotherapy treatment, on the prevention and management of extravasation of chemotherapeutic drugs.

METHOD

A quantitative, cross-sectional and descriptive study with Nursing team professionals working in a tertiary hospital in the interior of the State of São Paulo (SP), Brazil.

The Nursing team consisted of 24 members, however, three refused to participate and five were not eligible for either not working

directly with the chemotherapy treatment or being on vacation / health leave during the data collection period. Thus, the sample was composed of 16 professionals who answered a self-administered questionnaire, from November 2015 to February 2016.

The instrument was composed of sociodemographic variables, questions about professional practice time, oncological activity time and training on chemotherapy administration. To identify the professionals' knowledge about the adverse event under discussion, questions were elaborated with several alternatives, and it should be pointed out only the alternatives that the professionals defined as correct. Consequently, the options not indicated would be considered incorrect.

These issues involved the prevention of extravasation; signals and symptons; ducts in the treatment of extravasation; guidelines for the individual at home; identification of immediate reactions of extravasation; identification of late extravasation reactions and knowledge of the institutional extravasation protocol.

The study was forwarded and approved by the Research Ethics Committee, according to guidelines and regulatory norms for research involving human beings contained in Resolution CNS 466/2012 (CAAE: 49527315.1.0000.5393).

RESULTS

All participants were female. Age ranged from 24 to 59 years, with a mean age of 41.2 years (SD = 8.7 years) and the average working time in the oncology area was 8.1 years (SD = 7.7 years). Regarding the professional category, it was observed that 62.5% of the participants were nurses, 50% reported having attended some kind of specialization in the area of oncology and 43.2% reported having participated in training on the care that should be given to the patient in chemotherapy treatment (Table 1).

Table 1. Distribution of participants, according to age, professional category, specialization in oncology, training in the area and working time. Ribeirão Preto (SP), Brazil, 2016.

Variables	n=16	%
Age		
20 - 30	2	12.5
31 - 40	6	37.5
41 - 50	6	37.5
51-60	2	12.5
Professional category		
Nursing assistant	1	6.25
Nursing Technician	5	31.2
Nurse	10	62.5
Time of profession (years)		
01 - 10	7	43.7
11-20	6	37.5
21-30	2	12.5
31 - 40	1	6.2
Time of operation in oncology (years)		
0 - 10	12	75
11-20	3	18.7
21-30	1	6.2
Unit operating time (years)		
0 - 10	13	81.2
11-20	1	6.2
21-30	2	12.5
Specialization in Oncology		
Yes	8	50
No	8	50
Extravasation Training		
Performed by the nurse	1	6.2
Training in the sector	1	6.2
In training	1	6.2
Specialization in Courses / Congresses	2	12.5
Course of care with chemotherapy	2	12.5
Did not perform	9	56.2
The extravasation theme was addressed in vocational training		
Yes	10	62.5
No	6	37.5

Regarding the prevention of extravasation, all the participants pointed out that the training of the Nursing team is important to prevent it, as well as to avoid puncture in the lower limbs and to flush the vein with physiological saline after the infusion of the chemotherapeutic.

All indicated as incorrect that the best caliber of the devices are the largest and that the irradiated members, homolateral to mastectomy, with lymphedema and edema, can be considered for puncture. However, 12.5% showed that limbs with motor or sensory disturbances can be punctured for the infusion of chemotherapeutic agents.

Regarding the venous network, 87.5% of the participants stated avoiding the use of punctured veins for more than 24 hours, as well as the choice of small and fragile veins. It was observed that 43.7% showed as incorrect that maximum infusion time of vesicant drugs is 30 minutes in peripheral vein.

Regarding the behavior of "patting" on the venous network, 75% of the participants claimed that it should be avoided, as it can cause lesions in the vessels; and as to the order of choice for peripheral puncture, 62.5% of the professionals showed the order as incorrect: forearm, hand dorsum, wrist, and anticubital fossa. The results are shown in table 2.

Table 2. Distribution of extravasation prevention ducts according to participants' responses. Ribeirão Preto (SP), Brazil, 2016.

Condutas de prevenção	Correto		Incorreto	
	n=16	%	n=16	%
Nursing team training	16	100	0	0
Maximum infusion time of vesicant drugs is 30 minutes in peripheral vein	9	56.2	7	43.7
Avoid using punctured veins longer than 24 hours	14	87.5	2	12.5
Avoid puncturing lower limbs	16	100	0	0
For puncture, do not keep limb garrote for more than two minutes	7	43.7	9	56.2
Avoid 'patting' on veins due to vessel damage	12	75	4	25
The gauge shall be suitable for the vessel	14	87.5	2	12.5
Select small, fragile veins	2	12.5	14	87.5
The best caliber of the devices are the largest, to infuse faster	0	0	16	100
The order of choice should be: 1) forearm; 2) back of the hand; 3) wrist; 4) anticubital fossa	6	37.5	10	62.5
The attachment should be without excess adhesives so as not to impair visibility	14	87.5	2	12.5
Irradiated limbs, homolateral to mastectomy, with presence of lymphedema and edema may be considered for puncture	0	0	16	100
Members with motor or sensory disturbances (paraesthesia, paresis) should be avoided for puncture	14	87.5	2	12.5
Rinse the vein with saline after infusion of each chemotherapeutic	16	100	0	0

When extravasation of chemotherapeutic agents occurs, some signs and symptoms are identifiable. Of these, all professionals selected pain and 93.7% indicated that burning, erythema and edema are part of the symptomatology.

The absence of venous return was indicated by 75% of the participants and the discomfort at the puncture site, by 68.7%. Other signs such as drip changes and increased infusion resistance, were noted as incorrect in the list of signs and symptoms of extravasation, by 43.7% of the participants (Table 3).

Table 3. Distribution of signs and symptoms of extravasation by chemotherapeutic agents according to participants' responses. Ribeirão Preto (SP), Brazil, 2016.

Signs and symptoms	Correct		Incorrect	
	n=16	%	n=16	%
Burning	15	93.7	1	6.2
Puncture site discomfort	11	68.7	5	31.2
Erythema	15	93.7	1	6.2
Drip Change	9	56.2	7	43.7
Edema	15	93.7	1	6.2
Ache	16	100	0	0
No venous return	12	75	4	25
Increased infusion resistance	9	56.2	7	43.7

After extravasation occurs, treatment should be started quickly, correctly and in accordance with the institutional protocol. In this way, all the participants showed the interruption of the immediate infusion of the chemotherapeutic agent in case of extravasation; 93.7% showed the occurrence register (date, time, drug, site, signs and symptoms, extravasated quantity, type and needle gauge) as another treatment and 87.5% emphasized the application of the antidote (corticoid, hyaluronidase, dexrazoxane, etc.) as recommended in the institution's protocol, according to table 4.

Other approaches related to the treatment of extravasation were: aspirate the residual chemotherapy with a syringe (81.2%); elevate the affected limb (75%); avoid direct pressure at the site, remove the needle and use cold compress or ice application, for 15 to 20 minutes, at least, four times a day for the first 24-48 hours (62.5%). However, 75% of the participants reported as incorrect the use of warm compress, for 15 to 20 minutes, at least four times a day, in the first 24-48 hours, for chemotherapeutic agents such as Vincristine and Vinblastine, according to table 4.

Table 4. Distribution of extravasation treatment ducts, according to participants' responses (n = 16). Ribeirão Preto (SP), Brazil, 2016.

Treatment	Correct		Incorrect	
	n=16	%	n=16	%
Hot compress (vincristine and vinblastine), for 15 to 20 minutes, at least four times a day, for the first 24-48 hours	4	25	12	75
With a syringe, aspirate the residual medication	13	81.2	3	18.7
Apply the antidote (corticoid, hyaluronidase, dexrazoxane, etc.) recommended in the protocol of the institution	14	87.5	2	12.5
Raise limb	12	75	4	25
Avoid right pressure	10	62.5	6	37.5
Use cold compress or ice application, for 15 to 20 minutes, at least four times a day, for the first 24-48 hours	10	62.5	6	37.5
Stop the infusion immediately	16	100	0	0
Record the occurrence (date, time, drug, site, signs and symptoms, amount extravasated, type and needle gauge)	15	93.7	1	6.2
Remove the needle	10	62.5	6	37.5

The guidelines for the individual to continue the treatment at home are part of the Nursing practice and, due to this, some necessary guidelines were selected.

From these guidelines, all professionals showed that avoiding sun exposure is a correct orientation; 93.7% indicated the demand of the health service in the face of the appearance of blisters, ulcerations or necrosis; 75%, the scheduling of periodic returns for evaluation; 56.2%, do not use creams or lotions without health team recommendation, 75% medical evaluation for persistent pain and plastic surgeon evaluation if there is ulceration, according to table 5.

However, participants showed that, the use of appropriate dressings (43.7%) was incorrect, encouraged to use the limb normally (50%) and to keep the limb elevated for 48 hours (56.2%), according to table 5.

Table 5. Distribution of home patient orientations according to participants' answers (n = 16). Ribeirão Preto (SP), Brazil, 2016.

Orientations	Correct		Incorrect	
	n=16	%	n=16	%
Keep limb elevated for 48 hours	7	43.7	9	56.2
Encourage to use the member normally	8	50	8	50
Schedule recurring returns	12	75	4	25
Do not use cream or lotions without the recommendation of the health team	12	75	4	25
Look for the service if you have blisters, ulcerations or necrosis	15	93.7	1	6.2
Use appropriate dressings	9	56.2	7	43.7
Medical evaluation for persistent pain	12	75	4	25
Evaluation of the plastic surgeon if there is ulceration	12	75	4	25
Avoid sun exposure	16	100	0	0

After infusion of the chemotherapy, some immediate and local reactions may occur, even with proper care. Participants showed the following: increased sensitivity in the venous tract and hyperemia along the venous tract (81.2%); pain and pruritus (62.5%); burning (43.7%); and erythema and phlebitis (37.5%).

In addition to the immediate reactions, there are also the late reactions and the professionals showed the following: hyperpigmentation of the skin (87.5%); phlebitis and venous fibrosis (62.5%); hyperemia (56.2%); pain (43.7%); tissue discoloration (37.5%) and deep venous thrombosis (31.2%).

As for the protocol of institutional extravasation present in the sector, 87.5% of the participants showed that they knew it.

DISCUSSION

It was observed that the participants were mostly nurses (62.5%), with specialization in the oncology area (50%) and with previous training on the care that should be given to the individual undergoing chemotherapy (43.2%), .

The professional characteristics of the sample point to the importance of a trained Nursing team for a correct and effective chemotherapy administration process.[14] In this scenario, the nurse is the professional responsible for administering chemotherapy, according to Resolution 210, of July 1, 1998, of the Federal Nursing Council (COFEN) .15 In addition, it is up to nurses to prevent, identify and manage adverse events such as extravasation, thus, ensuring, quality care. [15]

In order to guarantee an effective and effective assistance, the prevention of extravasation by chemotherapeutic agents is the best measure to be achieved. It should be pointed out that one of these conducts is the identification of possible risk factors that may contribute to the occurrence of this adverse event, such as: peripheral venous network fragility; inadequate choice of venipuncture site; and members with puncture contraindications (prior chemotherapy or radiotherapy, axillary lymphadenectomy, lymphedema and peripheral neuropathy).[16]

Failure to identify possible risk factors was found, in this study, since 12.5% of the participants showed correct venipuncture in limbs with motor and sensory disorders and 62.5% indicated the order of puncture sites venous injury. The data corroborate a study carried out in the State of Paraná, Brazil, with nine members of the Nursing team, whose objective was to evaluate the knowledge of the Nursing team, of an adult chemotherapy outpatient clinic, on the extravasation of antineoplastic drugs, and found that only 22% of their participants noted the forearm region as the first choice of puncture site and 44% showed the anticubital fossa as the first choice.[17]

These data indicate that the team does not present technical and scientific knowledge to identify the extravasation risk factors. On the other hand, it is observed that the professional characteristics of the sample indicate that a considerable portion has training such activity. It is noted that the knowledge of the risk factors and the prevention of extravasation behaviors deserve to be highlighted, since acting in an early and immediate way contributes to the reduction of the risks of severe injuries that result in functional loss of the limb.[18]

The prevention of extravasation by chemotherapeutic agents, in addition to promoting patient safety, is also an important indicator of the quality of the health service and an essential aspect for the quality certification of the infusion centers. In this sense, the construction and application of protocols and policies that emphasize such behaviors becomes essential in clinical practice.[19]

Regarding the knowledge of the protocol of institutional extravasation, 87.5% of the

participants claimed that they knew it, contradicting the results found. The protocols contribute to the standardization of actions for certain events, proving to be a managerial tool of great impact and maintenance of the quality of the care provided.[20]

The protocol can be characterized by the operational detail of the conducts to be taken before a certain condition related to the care or health care and its specifications will guide the decision making of the professionals involved in the care, seeking the prevention, recovery or rehabilitation of health. [21]

Another aspect investigated was the identification of the symptomatology of extravasation, which may be manifested by various symptoms, mild or severe, depending on the drug and its concentration. Among the signs and symptoms, can be mentioned the sensation of burning, pain, hyperemia, edema, decrease or stop of the drip, resistance during the infusion and absence of venous return.[22-23]

In the study, it was identified that all participants showed pain with one of the signs and 93.7% indicated symptoms such as burning, erythema and edema. Regarding the evaluation of the venous network during the infusion of chemotherapy, the absence of venous return was indicated as a sign by 75% of the participants and the discomfort at the puncture site by 68.7%. However, other signs, such as drip changes and increased infusion resistance were noted as incorrect in the list of signs and symptoms of extravasation by 43.7%.

It is noticed that the majority of the participants know the symptoms indicative of extravasation, however, the signs related to the venous network are unknown and / or neglected. This fact encourages reflection, since intravenous therapy is widely approached in undergraduate courses and technical courses, being a daily practice in the professional exercise of the Nursing team. Intravenous therapy aims, at the administration of solutions and medications in the circulatory system and its process includes several stages, among them, preparation of the medication, obtaining and maintaining peripheral venous access and follow-up of intercurrences.[24] Thus, it is expected that professionals in the health services are aware of the venipuncture technique and the signs and symptoms of an adverse event such as extravasation or infiltration, and these signs are not exclusive to the events related to the chemotherapeutic agents.

However, only the identification of the symptomatology does not reduce the possible damages resulting from the adverse event presented, since it is necessary to adopt treatment pipelines. We sought to identify the conducts in the event of the adverse event and all the participants showed the interruption of the infusion immediately; 93.7%, registered the occurrence and 87.5%, applied the antidotes. However, 75% of the participants indicated that the use of a hot compress for chemo-therapeutic agents such as Vincristine and Vimblastine was incorrect, demonstrating that this non-pharmacological method of treatment was unknown.

The results were similar to the one already mentioned with professionals of the Nursing team, and all the professionals interviewed showed the interruption of the infusion as one of the conducts and, regarding the use of hot compress, only one participant (11%) presented knowledge about is measured.[17]

The importance of the knowledge regarding the use of hot compresses, in cases of extravasation by drugs like Vincristine and Vimblastine, is given since this technique can contribute to the reduction of tissue damages, since the heat causes the vasodilation and contributes to the absorption of the minimizing its damage.[19]

Also as part of the treatment pipeline, there is the extension of care at home, and the professional of the Nursing team should provide all guidance to the individual, family and caregivers on how to proceed. Thus, it was observed that all professionals showed that avoiding sun exposure is a correct orientation; and 93.7% indicate the demand of the health service in the face of the appearance of blisters, ulcerations or necrosis. However, other orientations, such as encouragement of limb movement (50%) and keeping the limb elevated for 48 hours (56.2%), were guidelines considered to be incorrect by professionals.

The data found in this study demonstrate that the professionals of the Nursing team involved in the administration of chemotherapy drugs are not aware of and / or neglect the behaviors of prevention, identification and management of extravasation. The study presented similar results to another study in which the knowledge deficit was identified, [17] however, the authors suggest that the results may be due to the short time of experience of the professionals in the sector studied - average time of one year and eight months[17] and in this study, the average working time in the oncology area was 8.1 years, reinforcing the hypothesis of lack of knowledge about the

issue or neglect of their professional performance.

In this sense, the relevance of permanent education in health services is highlighted, since it enables the articulation between the problem experienced in the reality of the service and its actors, contextualizing the work and learning process.[25]

CONCLUSION

It was noted the need to structure a permanent education program in the sector that meets the educational demands of the health team. This program is justified due to a lack of technical and scientific knowledge about the prevention, identification and management of extravasation by chemotherapeutic drugs.

The implementation of educational actions would provide more autonomy in the decision making of the Nursing team and, consequently, guarantee the safety of the individual under their care.

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