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Do Airline Pilots Get Enough Sleep Before Night and Early Shifts?

I. T. A. Sampaio, F. M. Fischer
FSP-USP, São Paulo, SP, Brazil

Keywords

- airline pilots
- sleep duration
- night shift
- early shift

Introduction: Most people would find a challenge working at nighttime. Workers are not supposed to sleep during the night working hours but should be alert during the whole shift. Similarly, early morning shifts demand the workers to phase advance their bed and waking times to have adequate rest before starting work. Anticipating sleep time may be difficult due to biological and social reasons.

Aim: We evaluated the mean total sleep duration (MTSD) around the clock and particularly before night and early morning shifts among airline pilots operating domestic flights in Brazil.

Methods: Study participants were 51 commercial pilots from Brazilian airlines (44 males, mean age 40 years). Their sleep and waking times were registered during 15 consecutive days. They wore actigraphs (Condor Instruments ActTrust 2) in the non-dominant wrist and filled out sleep logs during the data collection (Dec 21 - May 22). Their work schedules followed irregular work patterns according to ANAC's regulation. Night shifts were considered all flight duties starting from 00h00 to 06h00, and early-morning, 06h01 to 07h59. As further analysis was performed, the night shift was divided into three categories of two hours each (00h00 to 02h00; 02h01 to 04h00; 04h01 to 06h00).

Results: 493 flight duties were registered, among those 139 started during night and 72 during early-morning. MTSD before night and early-morning shifts was 389 minute (sd 102), while MTSD before all other flight duties during daytime and evening hours was 463 minute (sd 104). These MTSD are significantly different ($p < 0.001$). Comparing night to early morning, MTSD were 368 minute (sd 100) before night shifts and 429 minute (sd 94) before early mornings ($p < 0.001$). Results also showed MTSD increased as the starting working times delayed during night and early morning: 298, 332, 386, 429 minute, respectively. MTSD comparing 00h00 to 02h00 and 02h01 to 04:00 were not significantly different ($p = 0.44$). Starting flights between 00h00 and 04h00 showed the lowest MTSD (319 minute).

Conclusions: Starting work between 00h00 to 07h59 shortened MTSD ~75 minutes compared with joined day and evening hours. Considering NSF recommendation of sleep duration for 26–64 years, airline pilots do not get enough sleep before night and early flight duties. The reason is probably work schedule related.

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Diagnostic Ability of Insomnia through Metabolomic Analysis: A Systematic Review and Meta-analysis

L. H. Gonzaga¹, M. Meira e Cruz^{1,2,3}, A. Souza⁴, P. R. Ribeiro⁵, K. D. Ogasawara¹, M. Rosa⁶, K. M. Almondes⁷, C. Salles^{1,8,9}

¹Bahiana School of Medicine and Public Health, International Center on Clinical Sleep Medicine and Research, Salvador, BA, Brazil

²Sleep Unit, Cardiovascular Center of the University of Lisbon, Lisbon School of Medicine, Lisbon, Portugal

³European Sleep Center, Portugal

⁴Public Health Sciences at University of California, San Diego, International Center on Clinical Sleep Medicine and Research, United States

⁵Federal University of Bahia, International Center on Clinical Sleep Medicine and Research, Salvador, BA, Brazil

⁶Cardiovascular Centre of Universidade de Lisboa - CCUL, Faculty of Medicine, Universidade de Lisboa, International Center on Clinical Sleep Medicine and Research, Portugal

⁷Federal University of Rio Grande do Norte, International Center on Clinical Sleep Medicine and Research, Natal, RN, Brazil

⁸Professor Edgard Santos Hospital, Federal University of Bahia, Salvador, BA, Brazil

⁹Jorge Amado University Center, Salvador, BA, Brazil

Keywords

- adult
- sleep initiation and maintenance disorders
- metabolomics

Introduction: Metabolomics has wide clinical applicability, constituting a powerful tool for evaluating metabolic variations in individuals with insomnia.

Aim: To evaluate the diagnostic ability of metabolomic analysis to detect insomnia in adults.

Methods: Articles were searched for using the MEDLINE/PubMed, Cochrane, and VHL electronic databases by combining the Medical Subject Headings (MeSH) descriptors, including publications in English: Metabolomic, insomnia, adults. Inclusion criteria: articles that included metabolomic analysis, patients aged 18 years or older, diagnosed with insomnia by the Insomnia Severity Index (ISI), sleep diary, or the American Academy of Sleep Medicine criteria. Exclusion criteria: comorbidities, pregnant or breastfeeding women in the last 6 months, abstracts, conference proceedings, meetings and symposia, and crossover studies. PROSPERO registration number: CRD42021221679.

Results: A total of 791 studies were evaluated. Of these, 5 were included in the systematic review. Samples ranged from 30 to 40 subjects (total $n = 167$). One study identified 20 elevated and 14 reduced metabolites in patients with insomnia. The data obtained for glutamate/glutamine (Glx) levels were increased in insomniacs, while phosphocreatine (PCr) in the gray matter and phosphocholine in the white matter were reduced in this group. In addition, the GABA values were interesting since one study found it to be 30% reduced in insomniacs compared with the control group. Meanwhile, another study found this metabolite to be 12% higher in the occipital region in insomniacs.

Conclusions: Through the present study, it was possible to observe that many metabolites were able to characterize individuals with insomnia, especially the reduction of GABA at the brain level, phosphocreatine in the gray matter, and phosphocholine in the white matter. Despite the potential of some metabolic markers in predicting insomnia in adults, further studies will be necessary, with the definition