

UDC 616.8-009.836:159.963]-057.36-085

Kurilo V., Guk G.
Zaporizhzhia State Medical University, Zaporizhzhia, Ukraine

Курило В., Гук Г.
Запорожский Государственный Медицинский Университет, Запорожье, Украина

Sleep Disorders in Acting Military Services: Comparative Analysis of Psychopharmacological and Psychotherapeutic Correction

Нарушение сна во время военной службы: сравнительный
анализ психофармакологической и психотерапевтической
коррекции

Abstract

The mental health of military personnel of the Armed Forces of Ukraine is of a particular importance in the context of active hostilities in the country. Our attention is turned to the problem of frequently detected inorganic sleep disorders in patients of Zaporizhzhia military hospital, which are often associated with non-psychotic mental disorders of subclinical or clinical severity, which gives us a purpose to consider dyssomnic syndrome as a significant risk factor for adverse mental health outcomes and find new ergonomic options in sleep disorders management.

The purpose of the paper is to evaluate the clinical significance of new developed psychotherapeutic approach to inorganic sleep disorders management in comparison with standard pharmacological treatment.

On the base of Zaporizhzhia Military Hospital, Ukraine, with the informed consent, 44 acting military servicemen of the Armed Forces of Ukraine (males aged 19.4–58.1) with inorganic sleep disorders were included into 2-cohort clinical trial during their inpatient treatment. 20 patients, who chose psychotherapeutic treatment, formed the Cohort 1 of the study. Cohort 2 was formed with 24 patients, who preferred standard management with benzodiazepines. All participants underwent qualitative (clinical interview) and quantitative (Pittsburg Sleep Quality Index – PSQI, Epworth sleepiness scale rate) assessment of sleep characteristics twice – before treatment and just before discharge. Clinical-psychopathological, psychodiagnostic and statistical methods were used in the study.

The subjects from both cohorts showed sleeping relief and reported decrease of falling asleep time, the frequency of nocturnal wake-ups and early rises. It was objectified by PSQI fall from average 11.74 ± 3.12 and 11.79 ± 3.23 before treatment to 6.12 ± 3.42 and 6.04 ± 3.12 just before discharge from the hospital in the Cohort 1 and Cohort 2, respectively. Sleep improvement came about three days earlier in the Cohort 2. An average treatment duration was 8.20 ± 3.83 days. At the same time, 9 patients (37.5 %) of this group noted more pronounced daytime sleepiness in comparison with the Cohort 1 participants, whose sleep improvement developed later. However, it was associated with better concentration and alertness throughout the day.

The new developed method of psychotherapeutic correction of inorganic sleep disorders shows almost equivalent effectiveness in comparison with the standard drug treatment. Meanwhile, it has certain benefits for acting military servicemen, specifically absence of heaviness in the head

or pronounced daytime sleepiness and better concentration rate as these characteristics can significantly affect the quality of combat missions.

Keywords: sleep disorder, military servicemen, combatants, psychotherapeutic treatment, mental disorder, risk factor, mental health, benzodiazepines.

Резюме

Психическое здоровье военнослужащих Вооруженных Сил Украины имеет особое значение в условиях активных боевых действий в стране. Наше внимание привлекает проблема частого выявления нарушений сна неорганического генеза у пациентов Запорожского военного госпиталя, нередко в коморбидности с непсихотическими психическими расстройствами субклинического или клинического уровня. Это позволяет нам рассматривать диссомнический синдром как существенный фактор риска неблагоприятных последствий для психического здоровья, учитывая тот факт, что целесообразно искать новые эргономичные методы лечения нарушений сна.

Целью статьи является оценка клинической эффективности новой разработанной психотерапевтической методики коррекции неорганических нарушений сна в сравнении со стандартным фармакологическим лечением.

В 2-когортное клиническое исследование на базе Запорожского военного госпиталя (Украина) на основании информированного согласия во время стационарного лечения было включено 44 действующих военнослужащих Вооруженных Сил Украины с неорганическими нарушениями сна. Общую выборку составили мужчины в возрасте от 19,4 до 58,1 года. Двадцать пациентов, которые выбрали психотерапевтическое лечение, сформировали группу исследования 1 (ГИ-1). Вторая группа исследования (ГИ-2) была сформирована из 24 пациентов, которые предпочли стандартное лечение бензодиазепинами. Все участники прошли качественную (клиническое интервью) и количественную (индекс качества сна Питтсбурга – PSQI, показатель сонливости по шкале Эпворта) оценку характеристик сна дважды – перед лечением и непосредственно перед выпиской. В исследовании использовались клинико-психопатологические, психодиагностические и статистические методы.

Пациенты из обеих групп исследования сообщали об улучшении сна и об уменьшении времени засыпания, частоты ночных пробуждений и ранних подъемов. Объективизировалось данное улучшение падением PSQI со среднего значения $11,74 \pm 3,12$ и $11,79 \pm 3,23$ до лечения до $6,12 \pm 3,42$ и $6,04 \pm 3,12$ непосредственно перед выпиской из больницы в ГИ-1 и ГИ-2 соответственно. Улучшение сна наступало примерно на три дня раньше в ГИ-2 при средней продолжительности лечения $8,20 \pm 3,83$ дня. В то же время 9 пациентов (37,5%) этой группы отметили более выраженную дневную сонливость по сравнению с участниками ГИ-1, у которых улучшение сна наступало позже, однако сопровождалось лучшей концентрацией и скоростью реакции в течение дня.

Новая разработанная методика психотерапевтической коррекции неорганических нарушений сна демонстрирует почти равнозначную эффективность по сравнению со стандартным медикаментозным лечением. Вместе с тем она имеет определенные преимущества для действующих военнослужащих, например, отсутствие тяжести в голове или выраженной дневной сонливости и наличие высокого уровня концентрации внимания, поскольку эти показатели могут существенно повлиять на качество выполнения боевых задач.

Ключевые слова: расстройство сна, военнослужащие, участники боевых действий, психотерапевтическое лечение, психическое расстройство, фактор риска, психическое здоровье, бензодиазепины.

■ INTRODUCTION

The mental health of military personnel of the Armed Forces of Ukraine is of a particular importance in the context of active hostilities in the country. Our attention is turned to the problem of frequently detected sleep disorders in patients of Zaporizhzhia military hospital, which are present in 74–92% of hospitalized combatants. In more than 90% of all cases, dissomnic syndrome is associated with a non-psychotic mental disorder of subclinical or clinical severity, which gives us a purpose to consider dissomnic syndrome as a significant risk factor for adverse mental health outcomes [1].

Pharmacotherapeutic approach is the most commonly used for sleep disorders correction in outpatient and inpatient medical care. Current psychiatric practice shows that benzodiazepines are the most frequently administered hypnotics. Their sleep-relief effect is already proved in controlled studies, but this drug group is applicable only for short-term treatment unless its long-term efficacy for chronic insomnia management is not supported by randomized studies. Moreover, the tolerance development and drug-addiction risk under long-term prescription as well as withdrawal syndrome and suppression of consciousness clarity, attention rate, reaction speed cause significant limitations for their use in acting military personnel. Alternative treatment strategies, including antidepressants, are now approved in a few solid researches and their use restrictions relate to the need of a long course of treatment and its incongruence with status and job functions of combatants [7].

Psychopharmacological treatment restrictions together with developed in last decades biophysiological background of psychosomatic and psychosocial mechanisms interplaying the mediating role in sleep disorders onset boosted elaboration of non-pharmacological interventions [9]. These techniques are mostly targeted to maladaptive sleep habits correction, sleep hygiene education, self-regulatory cognitive, behavioral trainings and physical practices [2, 3, 8]. Due to these developments besides standard pharmacological prescriptions current tendencies in management of inorganic sleep disorders consider psychotherapeutic methods of insomnia correction, which are assumed to be a good alternative due to their effectiveness, ergonomy, prospects for out-of-hospital use, in contrast with hypnotics and psychotropic agents cognitive side effects and limitations in prescription [6]. Cognitive and behavioral therapy for insomnia, Eye Movement Desensitization and Reprocessing, hypnotic techniques, bodydynamic therapy and their modifications are most often mentioned in this context [5].

And although these methods have significant advantages, there still are some restrictions on the use of such techniques at the hospital stage principally associated with the lack of qualified staff for professional support, the necessity of repeated sessions, delay in time of their effect, which, coupled with short terms of inpatient treatment, makes it difficult to control the effectiveness of used method and its personalized adjustment if such is needed. That is why our study is devoted to the development of special express psychotechnique against dyssomnic syndrome, which would solve the issues of existing methods and drawn up a worthy alternative to psychopharmacological treatment.

■ PURPOSE

The aim of our study was to compare the effectiveness of the developed technique of short-term autogenous correction and pharmacological correction of inorganic sleep disorders.

■ MATERIALS AND METHODS

In the framework of PhD-dissertation approved by the Commission on Bioethics in Zaporizhzhia State Medical University, on the basis of Zaporizhzhia Military Hospital, through the written informed consent procedure, we examined 44 active combatants of ATO/OUP undergoing inpatient treatment in Therapeutic Department. The contingent consisted of men aged 19.4 to 58.1 years. After special psychiatric examination and detecting the dyssomnic syndrome, all participants underwent clinical psychopathological, psychodiagnostic examination and were invited to choose pharmacologic or psychotherapeutic treatment optionally. Non-drug-related sleep correction was chosen by 20 participants (45.45%), who formed Cohort 1 in this study, meanwhile psychopharmacotherapy became preferable for 24 participants (54.54%), constituting the Cohort 2. During individual consultation with the psychiatrist, participants from Cohort 1 were provided with advices on sleep hygiene and were instructed on autogenous correction of dyssomnic syndrome, designed like a modification of an autogenous training with a body-oriented component, after which participants practiced it daily throughout the inpatient treatment. Members of Cohort 2 were administered benzodiazepines per os. The average treatment term lasted 8.20 ± 3.83 days.

Sleep quality in both research groups was assessed via semi-structured clinical interview, the Epworth Sleepiness Scale and the Pittsburgh Questionnaire to identify the rates of daytime sleepiness and Pittsburgh sleep quality index (PSQI) twice – initially before treatment and finally just before discharge.

The general PSQI score is calculated as a sum of the seven component, regarding sleep efficiency (sleep duration and sleep efficiency variables), perceived sleep quality (subjective sleep quality, sleep latency, and sleep medication variables), and daily disturbances (sleep disturbances and daytime dysfunctions variables), each rated from 0 to 3 scores (where lower scores indicate better sleep quality). Traditionally, the items from the PSQI have been summed to create a total score to measure overall sleep quality, providing an overall score ranging from 0 to 21 [4].

The Epworth Sleepiness Scale has a synonymic structure. Questionnaire asks the patient to rate the probability of falling asleep on a scale of increasing probability from 0 to 3 for eight different situations that most people are engaged in during their daily lives, though not necessarily every day. The scores for the eight questions are added together to obtain a single number. The correlation between total scores and severity of daytime sleepiness is directly proportional. Lower mark is associated with lower daytime sleepiness and vice versa.

■ RESULTS

As part of the study, the participants of Cohort 1 were taught the author's technique of body-oriented autogenous training of the identified sleep disorders correction. The developed technique had 5 stages: the first – preparatory stage, where the participants were asked to take the most comfortable and relaxed position; the second stage – respiratory, where participants were taught a special breathing pattern, taught to control its depth and tempo, to focus on internal, bodily sensations, which caused much greater relaxation; the third one – muscle relaxation stage, aimed at identifying and eliminating muscle spasms; the fourth stage – visualization, where the participants were asked to visualize the identified muscle spasms as a very detailed visual image (dirt, stone, dust, viscous substance, liquid etc.), which disappears with each breathing cycle; the fifth stage – falling asleep, where falling asleep occurs with improved sleep quality.

Obtained average rates of severity of sleep disorders and severity of daytime sleepiness had no significant differences between Cohort 1 and Cohort 2. According to the results of both management strategies we received clinically significant quantitative and qualitative sleeping characteristics improvement in both study groups. Initial PSQI rate before treatment reached 11.74 ± 3.12 among Cohort 1 participants and 11.79 ± 3.23 in Cohort 2 (Fig. 1).

According to the same assessment after inorganic sleep disorders correction, its indicator decreased to 6.12 ± 3.42 in 6.04 ± 3.12 in Cohort 1 and 2 respectively. Such descriptive characteristics of sleep as the duration of falling asleep, the frequency of nocturnal awakenings, and the early rise also diminished in both groups. General PSQI score fall was almost equivalent and reached about 48% in both groups. Due to the self-report of the servicemen, faster sleep improvement was registered in Cohort 2 members by an average of 3 days. While the noticeable effect of the use of benzodiazepines developed already after the first applications, namely on the first or second day of taking, a significant improvement in sleep with autogenous correction developed closer to fourth day of practicing. However, Cohort 1 participants reported that they had no problems waking

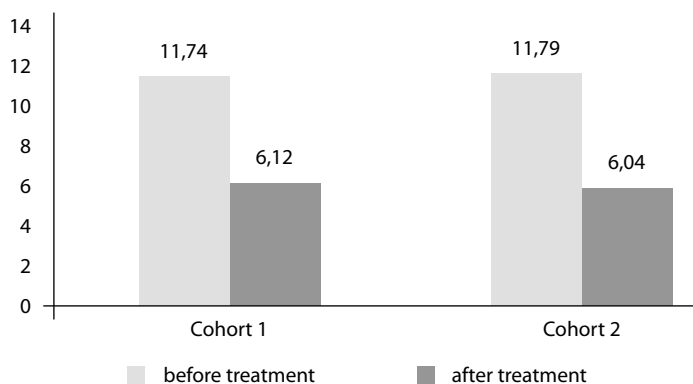


Fig. 1. PSQI before/after treatment dynamics (in points acc. Pittsburgh Questionnaire)

Рис. 1. ИКСП до и после лечения (в баллах по Опроснику Питтсбурга)

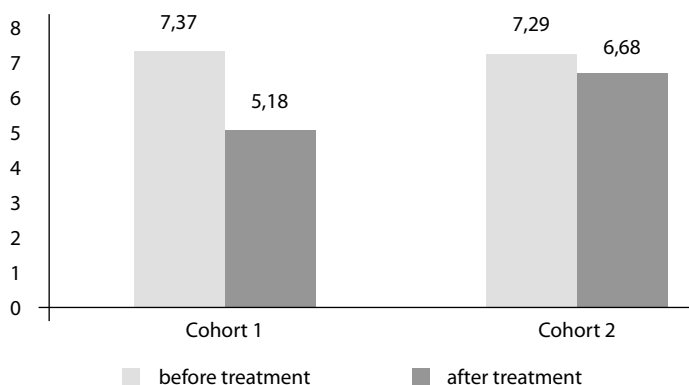


Fig. 2. Daytime sleepiness before/after treatment dynamics (in points acc. Epworth Sleepiness Scale)

Рис. 2. Дневная сонливость до и после лечения (в баллах по шкале сонливости Эпворта)

up (also in the early hours), while Cohort 2 participants had complaints of unpleasant and burdensome feeling upon awakening regardless of hour. It should also be noted that among the participants of Cohort 1 complaints of bad dreams were reduced on average by 2–3 days longer than among the participants of Cohort 2, which can be explained by the delay associated with the time needed for the participants to master the non-drug-related sleep correction technique.

Sleep disorders associated with increased sleepiness during the day were identified by using the Epworth Sleepiness Scale. Significant reductions in the incidence of sleep disorders were found in both cohorts (Fig. 2).

In Cohort 1 the mean daytime sleepiness value was 7.37 ± 4 before the treatment started and went down to 5.18 ± 3.80 on correction just before discharge (decreased by 29.72%), whereas in Cohort 2 the daytime sleepiness level initially was 7.29 ± 4.25 and slightly decreased 6.68 ± 3.82 after drug treatment (decreased by 8.37%) (Fig. 2). Despite the absence of statistically significant differences between the after-therapy results in both cohorts, it should be noted that the participants from Cohort 2 quite often complained of daytime sleepiness, they reported a high probability of falling asleep during the day, while being in a car as a passenger or in time after lunch without alcohol, which significantly reduced their daily activity and military services. That was also illustrated by the subjective Cohort 2 participants' responses in descriptions their low concentration rate, feeling of heaviness in the head during the day, which were subjectively associated with the intake of benzodiazepines in the framework of drug therapy for sleep disorders. It should also be noted that Cohort 1 did not report similar unwanted symptoms.

■ DISCUSSION

Considering dyssomnic syndrome as a modifiable risk factor for a mental health disorder, the need for prevention, timely detection and correction of pre-existing sleep disorders in acting combatants is an important clinical

issue. The presence of an alternative autogenous method of dyssomnic disorders correction in active military personnel for inpatient care has significant advantages, such as ergonomics of the methodology, absence of necessity to seek for specialized medical care, no risk of undesirable pharmacologic effects or depression of the central nervous system. In view of this, expanding the scope of the study and a detailed exploration of the structure and dynamics of dyssomnic syndrome in cases when the technique of short-term autogenous correction is applied may be useful for enlightening feasibility and prospects of its clinical application.

■ CONCLUSIONS

1. The new developed method of psychotherapeutic correction of inorganic sleep disorders shows almost equivalent effectiveness in comparison with standard drug treatment.
2. Positive drug effect on sleep quality develops in average 3 days faster than such from non-pharmacological autogenous training.
3. Psychotherapeutic correction of inorganic sleep disorders has certain benefits for acting military services, specifically absence of heaviness in the head or pronounced daytime sleepiness and better concentration rate.

Conflict of interest. The authors declare no conflict of interest.

■ REFERENCES

1. Danilevska N.V. (2017) Etiopatohetnychni ta nozostrukturalni skladovi porushennia snu u viiskovosluzhbovtziv – uchasykiv ATO [Etiopathogenetic and nosostructural components of sleep disorders in servicemen – participants of the anti-terrorist operation]. *Medychna psykholohiia*, 4, 38–40.
2. Black D.S., O'Reilly G.A., Olmstead R. (2015) Mindfulness meditation and improvement in sleep quality and daytime impairment among older adults with sleep disturbances: a randomized clinical trial. *JAMA Intern Med*, 175 (4), 494–501.
3. Chiu H.L., Chan P.T., Chu H. (2017) Effectiveness of Light Therapy in Cognitively Impaired Persons A Meta-analysis of Randomized Controlled Trials. *J Am Geriatr Soc*, 65, 2227–2234. DOI: 10.1111/jgs.14990.
4. Cole J.C., Motivala S.J., Buysse D.J. (2006) Validation of a 3-factor scoring model for the Pittsburgh Sleep Quality Index in older adults. *Sleep*, vol. 29 (1), pp. 112–116. doi:10.1093/sleep/29.1.112.
5. Hohagen F. (1996) Nonpharmacological Treatment of Insomnia. *Sleep*, 19 (8), 50–51.
6. Maness D.L., Khan M. (2015) Nonpharmacologic Management of Chronic Insomnia Am Fam. *Physician*. 92 (12), 1058–1064. DOI: 10.1016/2013.05.008.
7. Matura L.A., McDonough A., Hanlon A.L. (2015) Sleep disturbance, symptoms, psychological distress, and health-related quality of life in pulmonary arterial hypertension. *Eur J Cardiovas Nurs*, 14 (5), 423–430. DOI: 10.1177/1474515114537951.
8. Reid K.J., Baron K.G., Lu B. (2010) Aerobic exercise improves self-reported sleep and quality of life in older adults with insomnia. *Sleep Med*. 11 (9), 934–940. DOI: 10.1016/j.sleep.2010.04.014, 14.
9. Umesh K.V. (2013) Non-Pharmacological Management of Insomnia. *B Journal of Med Pract*, 6 (3), 623.

Submitted/Подана: 15.01.2021

Accepted/Принята: 23.04.2021

Contacts/Контакты: v.kurilo@i.ua, galinaguc@gmail.com