CORRECTION OF SIGNS OF ASTHENO-VEGETATIVE SYNDROME, PSYCHO-EMOTIONAL STATE AND SLEEP QUALITY BY MEANS OF PHYSICAL THERAPY IN MILITARY PERSONNEL WITH CONSEQUENCES OF TRAUMATIC BRAIN INJURY AND COMPLICATED BRUXISM

КОРЕКЦІЯ ОЗНАК АСТЕНО-ВЕГЕТАТИВНОГО СИНДРОМУ, ПСИХОЕМОЦІЙНОГО СТАНУ ТА ЯКОСТІ СНУ ЗАСОБАМИ ФІЗИЧНОЇ ТЕРАПІЇ У ВІЙСЬКОВОСЛУЖБОВЦІВ З НАСЛІДКАМИ ЧЕРЕПНО-МОЗКОВОЇ ТРАВМИ ТА УСКЛАДНЕНИМ БРУКСИЗМОМ

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DOI https://doi.org/10.32782/2522-1795.2025.19.4.2

Abstract

Objective. The aim of the study was to assess the effectiveness of the developed physical therapy program in military personnel with the consequences of closed traumatic brain injury and complicated bruxism, by analyzing the dynamics of astheno-vegetative syndrome, psycho-emotional state (anxiety, depression), sleep quality and multidimensional fatigue.

Material. 98 men participated in the prospective study. The control group (CtrlG, n=35) consisted of men without dental lesions and TBI (mean age 29.3±1.7 years). The comparison group (n=32) consisted of civilians with bruxism in combination with temporomandibular joint dysfunction, who received only the wearing of individual relaxing occlusal splints. The main group (MG, n=31) consisted of military personnel aged 30.6±1.8 years with the consequences of traumatic brain injury and complicated bruxism, who underwent a physical therapy program in combination with wearing occlusal splints (duration 2 months – 14 inpatient sessions, 14 telerehabilitation sessions, 14 sessions of independent exercises). All participants were assessed at the beginning of the study: Hospital Anxiety and Depression Scale (HADS), Pittsburgh Sleep Quality Index (PSQI), Multidimensional Fatigue Inventory (MFI 20), autonomic nervous system function – according to 24-hour monitoring of heart rate variability.

Results. In the control group, low mass indices of anxiety (4 [3; 4]) and depression (3 [2; 3]), PSQI 5.16±0.36, moderate level of fatigue (MFI 20: general fatigue 8 [5; 11]) were recorded. In the comparison group, a significant increase in anxiety to 8 [7; 9] (100% relative to the CtrlG) and depression to 9 [8; 10] (200%), PSQI=12.17±1.03 (136%), multidimensional fatigue was also higher: general fatigue 10 [7; 12] (25%). In the MG before physical therapy, the level of anxiety was 12 [10; 14] (200% of the CtrlG), depression 11 [10; 13] (267%), PSQI=18.37±1.15 (256%), general fatigue 16 [13; 18] (100% of the CtrlG). After physical therapy, in the MG, anxiety decreased to 7 [6; 8] (41.7%), depression to 6 [6; 7] (45.5%), PSQI to 10.58±0.62 (42.4%), general fatigue to 11 [9; 13] (31.3%), physical fatigue to 12 [9; 15] (20%). Autonomic function indicators also improved: LF decreased from 2809.31±51.40 to 2067.92±42.19 ms² (26.4%), HF increased from 712.19±15.28 to 831.26±17.12 ms² (16.7%), LF/HF ratio decreased from 3.94±0.19 to 2.49±0.09 (36.8%), Baevsky index decreased from 230.19±14.65 to 173.22±15.45 points (4.7%).

Conclusions. In military personnel with traumatic brain injury and complicated bruxism, disorders of autonomic regulation, psychoemotional state, sleep, and increased fatigue were found. It has been shown that a comprehensive physical therapy program in combination with occlusal treatment provides a statistically significant improvement in all measured parameters ($p<0.05$).

Key words: physical therapy, military personnel, bruxism, maxillofacial region, traumatic brain injury, astheno-vegetative syndrome, joint dysfunction.

Мета. Мета дослідження – оцінити ефективність розробленої програми фізичної терапії у військовослужбовців з наслідками закритої черепно-мозкової травми (ЧМТ) та ускладненим бруксизмом шляхом аналізу динаміки астено-вегетативного синдрому, психоемоційного стану (тривога, депресія), якості сну та багатовимірної втоми.

Матеріал. У проспективному дослідженні взяли участь 98 чоловіків. Контрольну групу (КГ, n=35) становили чоловіки без стоматологічних уражень та ЧМТ (середній вік 29,3 ± 1,7 року). Групу порівняння (ГП, n=32) становили цивільні особи з бруксизмом у поєднанні з дисфункцією скронево-нижньощелепного суглоба, які отримували лише носіння індивідуальних релаксуючих оклюзійних шин. Основну групу (ОГ, n=31) становили військовослужбовці віком 30,6 ± 1,8 року з наслідками ЧМТ та ускладненим бруксизмом, котрі пройшли програму фізичної терапії в комплексі з носінням оклюзійних шин (тривалістю 2 місяці – 14 сесій стаціонарно, 14 сесій телереабілітації, 14 сесій самостійних занять). Методи оцінювання: Hospital Anxiety and Depression Scale (HADS), Pittsburgh Sleep Quality Index (PSQI), Multidimensional Fatigue Inventory (MFI-20), функція вегетативної нервової системи – за 24-годинним моніторуванням варіабельності серцевого ритму.

Результати. У контрольній групі зафіксовано низькі масові показники тривоги (4 [3; 4]) і депресії (3 [2; 3]), PSQI 5,16 ± 0,36, помірний рівень втоми (MFI-20: загальна астенія 8 [5; 11]). У ГП спостерігалось значне підвищення тривоги до 8 [7; 9] (100% відносно КГ) і депресії до 9 [8; 10] (200%), PSQI = 12,17 ± 1,03 (136%), багатовимірна втома також більша: загальна астенія 10 [7; 12] (25%). В основній групі до фізичної терапії рівень тривоги становив 12 [10; 14] (200% від КГ), депресії – 11 [10; 13] (267%), PSQI = 18,37 ± 1,15 (256%), загальна астенія – 16 [13; 18] (100% від КГ). Після фізичної терапії в ОГ тривога знизилась до 7 [6; 8] (41,7%), депресія – до 6 [6; 7] (45,5%), PSQI – до 10,58 ± 0,62 (42,4%), загальна астенія – до 11 [9; 13] (31,3%), фізична астенія – до 12 [9; 15] (20%). Показники вегетативної функції також покращились: LF зменшився з 2809,31±51,40 до 2067,92±42,19 мс^2 (26,4%), HF зросла з 712,19±15,28 до 831,26±17,12 мс^2 (16,7%), коефіцієнт LF/HF знизився з 3,94±0,19 до 2,49±0,09 (36,8%), індекс Баєвського зменшився з 230,19±14,65 до 173,22±15,45 балів (4,7%).

Висновки. У військовослужбовців з ЧМТ і ускладненим бруксизмом виявлено порушення вегетативної регуляції, психоемоційного стану, сну та підвищену втому. Визначено, що комплексна програма фізичної терапії у поєднанні з оклюзійним лікуванням дає статистично значуще покращення у всіх виміряних параметрах ($p<0,05$).

Ключові слова: фізична терапія, військовослужбовці, бруксизм, щелепно-лицева ділянка, черепно-мозкова травма, астено-вегетативний синдром, суглобова дисфункція.

Introduction. The high prevalence and complexity of the consequences of traumatic brain injuries (TBI) among military personnel, especially in conditions of active combat, determines numerous directions of research in various branches of medicine and determines their multidisciplinary nature. TBI is one of the most frequent pathologies among participants in modern armed conflicts and leads to persistent cognitive, somatic, emotional and vegetative disorders that reduce the functional capabilities and quality of life of military personnel [7]. After TBI, dysregulation of the sympathetic and parasympathetic branches of the autonomic nervous system is often noted, leading to multisystem dysfunction [17]. One of the possible consequences of this condition is astheno-vegetative syndrome – a condition that combines chronic fatigue, sleep disorders, reduced tolerance to stress, headaches, vegetative lability and emotional instability associated with dysregulation of the autonomic nervous system [12].

A significant proportion of servicemen with TBI have sleep disorders, including insomnia, sleep fragmentation, hypersomnia, and parasomnias, among which bruxism – teeth grinding or clenching – is of particular interest. It has been demonstrated that work stress in military pilots correlates with the frequency of bruxism episodes [2]. Under conditions of combat or duty stress, chronic hyperactivation of the sympathetic nervous system develops in military personnel, which acts as a trigger for the development of motor activity in the form of bruxism [5]. In addition, bruxism in patients after traumatic brain injury or with posttraumatic stress disorder (PTSD) requires a comprehensive approach: it can be a marker of increased muscle tension, sympathetic activation, sleep disorders and poor quality of life [15; 16]. Temporomandibular joint dysfunction (TMD), which is both a consequence and a complicating factor of bruxism, requires special attention in this cohort of patients. TMD is manifested by pain in the joint area, muscle hypertonus, clicking, limitation of mouth opening and decreased masticatory efficiency. Emotional states – anxiety, depression, stress – significantly correlate with symptoms of TMD [3; 4]. Similar results were obtained in a study among individuals with PTSD: the presence of psychoemotional disorders significantly increased the risk of developing facial musculoskeletal disorders, including TMD [1; 6]. In military personnel and veterans, especially after TBI, the risks of developing TMD increase due to a combination of neurotraumatic, psychoemotional, and muscle-mechanical components [8].

In addition, TMD, bruxism, and PTSD are multifactorial conditions that are accompanied not only by somatic manifestations, but also by a significant deterioration in the quality of life, sleep disorders, social isolation, and decreased work capacity. This requires the use of not only a pharmacological but also a non-pharmacological approach aimed at normalizing autonomic homeostasis, muscle tone, psychoemotional balance, and sleep quality [10].

Physical therapy, particularly in the framework of multidisciplinary rehabilitation, has proven its effectiveness in correcting autonomic disorders, normalizing sleep, reducing psychoemotional stress, and improving the functional state of the musculoskeletal system [9; 14; 15]. The use of methods of muscle relaxation, neuromuscular stabilization, therapeutic exercises, manual intervention, and respiratory rehabilitation techniques can be considered as scientifically based approaches to improving the general condition of servicemen with TBI and concomitant disorders.

The relevance of the issue for military medicine and medical support of wounded servicemen – neurology, rehabilitation medicine, physical therapy, and dentistry determines the issues of the created work.

The aim of the study is to assess the effectiveness of the developed physical therapy program based on the dynamics of indicators of astheno-vegetative syndrome, psycho-emotional state and sleep quality in military personnel with the consequences of traumatic brain injury and complicated bruxism.

Material and methods. 98 men participated in the longitudinal prospective study.

The control group (CtrlG) consisted of 35 men aged 29.3±1.7 years (22–39 years) without a burdened dental status (bruxism, TMD, inflammatory processes of the oral cavity tissues, etc.) and the consequences of TBI. The hypothesis of involving this group in the study was to determine the values of the studied physiological indicators in conditionally healthy men.

The group of examined individuals with bruxism combined with TMD consisted of 63 men (civilians and military personnel), who formed the comparison group and the main group.

The comparison group (CG) consisted of 32 male civilians aged 26.2±1.6 years (21–37 years), in whom the signs of complicated bruxism were reduced by wearing individually manufactured relaxing occlusal splints (splint therapy). The hypothesis for involving this group in the study was to compare the impact of combat TBI on the studied indicators compared to the condition of civilians.

The main group (MG) consisted of 31 men – military personnel (aged 30.6±18 years (22–40 years), who underwent a developed rehabilitation program, which included not only wearing individual relaxing occlusal splints, but also the use of a physical therapy program.

Inclusion criteria: history of combat craniocerebral trauma (closed, mild, corrected by an individual treatment regimen, received no less than 6 months before the study); absence of focal sensory or motor consequences of TBI; cognitive preservation; bruxism of I–II degree of severity with a decrease in the height of the dentition, diagnosed according to the criteria of J. Lee et al. (2010); presence of TMD (confirmed clinically and radiographically); complete dentition (excluding third molars); consent to participate in the study.

Exclusion criteria: severe combat TBI; open TBI; presence of external fixation devices, plaster casts, etc.; amputation defects on the upper and lower extremities; uncorrected consequences of internal organ or musculoskeletal injuries; drug-induced or symptomatic bruxism; presence of acute or exacerbation of chronic somatic or mental pathology at the time of examination; partial loss of teeth; presence of orthopedic structures in the oral cavity; history of botulinum toxin injections.

The physical therapy program for MG individuals lasted two months. It consisted of 14 outpatient rehabilitation sessions in a rehabilitation center, 14 sessions in the telerehabilitation format, and 14 independent classes according to a developed individual program.

The purpose of the developed physical therapy program was: to improve the balance of the sympathetic and parasympathetic branches of the autonomic nervous system; to reduce the degree of psychoemotional stress; to normalize sleep; to normalize the strength and tone of the facial muscles (masticatory and facial) and neck; to reduce local soreness and severity of trigger zones of the face, neck, cervical-collar zone, and shoulder girdle; to reduce general asthenic manifestations.

The program was divided into two blocks: interventions aimed at correcting disorders of the maxillofacial region and interventions aimed at correcting general asthenic manifestations, autonomic dysfunction, etc. Physical therapy included therapeutic exercises for the muscles of the face, neck, back, shoulder girdle, breathing exercises, exercises for general relaxation; a course of massage of the masticatory muscles, maxillofacial area, neck; postisometric relaxation of the masticatory muscles, neck muscles; kinesiological taping of the maxillofacial area, masticatory muscles, neck; autorelaxation sessions.

The state of the autonomic nervous system was determined by the results of 24-hour monitoring of heart rate variability and spectrogram analysis using the following indicators: power in the low-frequency range LF (low frequency), ms^2 (0.04–0.05 Hz), power in the high-frequency range HF (high frequency), ms2 (0.15–0.4 Hz), LF/HF ratio, Baevsky voltage index (24-hour heart rate variability monitoring and analysis system “DIACARD”, JSC “Solvaig”).

Sleep quality was characterized by the Pittsburgh Sleep Quality Index (PSQI).

Psychoemotional status was determined by the Hospital Anxiety and Depression Scale (HADS).

The severity of asthenic syndrome was assessed by the Multidimensional Fatigue Inventory (MFI-20).

The study was conducted taking into account the principles of the Declaration of World Medical Association Declaration of Helsinki “Ethical Principles of Medical Research Involving Human Subjects”. Informed consent was obtained from all patients involved in the presented study. The study protocol was discussed and approved at a meeting of the Bioethics Commission of the Vasyl Stefanyk Carpathian National University.

Statistical processing of the results was carried out using the IBM SPSS Statistics software package, version 26.0 (IBM Corp., Armonk, NY, USA). The nature of the data distribution was previously checked using the Shapiro–Wilk test. For indicators with a normal distribution, parametric statistical methods were used, in particular, the Student test for related samples (t-test). The results were presented as the mean and standard deviation (M±SD). For variables with a distribution that differed from normal, nonparametric methods were used – the Wilcoxon test for paired samples. The data are presented as the median with the interquartile range (Me [Q25; Q75]). The level of statistical significance was set at $p<0.05$.

Results. Analysis of 24-hour heart rate variability monitoring data revealed impaired autonomic tone in patients with combined consequences of traumatic brain injury and complicated bruxism (Table 1).

Compared with the control group, where the LF (low-frequency component reflecting sympathetic activity) was 1232.11±23.07 ms^2, in the comparison group this indicator was increased by 41.2% (740.22±31.28 ms^2), and in the main group at the initial examination – by 128% (2809.31±51.40 ms^2). This indicates a pronounced dominance of the sympathetic division of the autonomic nervous system in individuals with bruxism, especially among military person-

Table 1

Dynamics of the results of 24-hour monitoring of heart rate variability in military personnel with consequences of traumatic brain injury and complicated bruxism (M±SD)

Para-meter	CtrlG (n=35)	CG (n=32)	MG (n=31)	
			Before physical therapy	After physical therapy
LF, мс^2	1232,11±23,07	1740,22±31,28*	2809,31±51,40*	2067,92±42,19*″⁘
HF, мс^2	956,30±17,24	776,49±10,13*	712,19±15,28*	831,26±17,12*″⁘
LF/HF	1,29±0,18	2,24±0,27*	3,94±0,19*	2,49±0,09*″
Baevsky index, points	106,51±8,12	180,56±13,07*	230,19±14,65*	173,22±15,45*″

Note (here and hereinafter): * – statistically significant difference compared to the value of the corresponding parameter of CtrlG individuals ($p<0.05$);

″ – statistically significant difference compared to the parameter of the initial examination ($p<0.05$);

⁘ – statistically significant difference compared to the corresponding parameter of CG individuals ($p<0.05$).

nel with TBI. After a course of physical therapy in MG, there was a significant decrease in LF to 2067.92±42.19 ms^2 (by 26.4% compared to the initial level, $p<0.05$), which indicates a positive trend in reducing sympathetic hyperactivity.

The HF indicator, which characterizes parasympathetic activity, was the highest in the control group – 956.30±17.24 ms^2. In CG, it was lower by 18.8% (776.49±10.13 ms^2), in MG – by 25.5% (712.19±15.28 ms^2), which reflects reduced vagal regulation in patients with pathology. After the physical therapy program, the military personnel had a significant increase in HF to 831.26±17.12 ms^2 – an increase of 16.7% compared to the baseline and a higher level than in the CG, which indicates the activation of the parasympathetic department and improved adaptive capabilities of the body.

The LF/HF ratio, which reflects the balance of sympathetic and parasympathetic regulation, in CtrlG was 1.29±0.18, which corresponds to normal vegetative balance. In the CG, this indicator was increased to 2.24±0.27, and in the MG it reached 3.94±0.19, which indicates a significant imbalance with a predominance of sympathetic activity. After physical therapy, this ratio in the MG decreased by 36.8% compared to the baseline level (2.49±0.09).

The Baevsky index, which is an integral indicator of the stress tension of regulatory systems, in CtrlG was 106.51±8.12. In CG it was increased by 69.5% (180.56±13.07), and in MG – by 116.2% (230.19±14.65), which indicates a high level of psychophysiological tension. After the intervention, the index in MG decreased by 24.7% below the baseline level (173.22±15.45), reaching a level close to the CG index ($p>0.05$), which is evidence of the adaptive effect of physical therapy.

Analysis of the primary results of the HADS questionnaire indicates a significant increase in anxiety and depression scores in individuals with bruxism (Table 2). In the control group, the median anxiety score was 4 points [3; 4], while in the CG this score reached 8 points [7; 9] (100% higher). In military personnel with TBI before the use of physical therapy, the level of anxiety was even higher – 12 points [10; 14], which was 200% higher than the CtrlG score. A similar trend was observed for the depression scale: in CtrlG – 3 points [2; 3], in CG – 9 points [8; 10] (200% higher), and in MG – 11 points [10; 13] (267% higher compared to CtrlG).

After undergoing a course of physical therapy in MG, a significant improvement in psycho-emotional state was recorded. The level of anxiety decreased to 7 points [6; 8], which is 41.7% less compared to the initial examination in this group (12 points). The level of depression decreased from 11 to 6 points [6; 7] (by 45.5%).

After undergoing a course of physical therapy in military personnel, the values of both scales became lower compared to CG. In particular, the level of anxiety in MG after therapy was 7 points versus 8 in CG, and the level of depression was 6 versus 9 points, respectively.

Analysis of the dynamics of the Pittsburgh Sleep Quality Index scale revealed significant sleep disturbances in servicemen compared to the control group, as well as positive dynamics after a course of physical therapy (Fig. 2). In

Table 2

Dynamics of HADS questionnaire results in military personnel with consequences of traumatic brain injury and complicated bruxism under the influence of physical therapy (Me [Q25; Q75])

Scale, points	CtrlG (n=35)	CG (n=32)	MG (n=31)	
			Before physical therapy	After physical therapy
Anxiety	4 [3; 4]	8 [7; 9]*	12 [10; 14]*	7 [6; 8]*″⁜
Depression	3 [2; 3]	9 [8; 10]*	11 [10, 13*	6 [6; 7]*″⁜

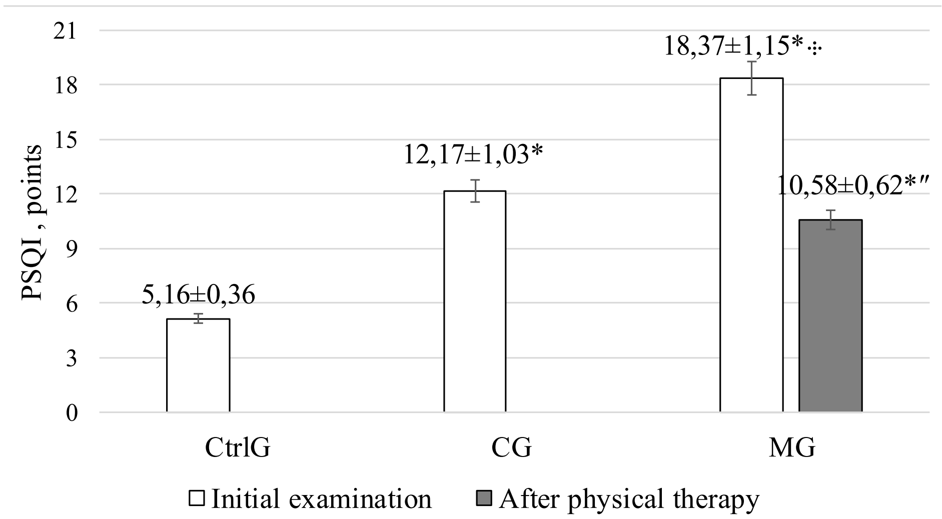

Fig. 1. Dynamics of sleep quality indicators according to PSQI in military personnel with consequences of traumatic brain injury and complicated bruxism under the influence of physical therapy

CtrlG, the average score on the PSQI scale was 5.16±0.36 points, which indicates a mostly good sleep quality, which is typical for individuals without neurological and somatic disorders. In CG, the average score reached 12.17±1.03 (136% higher than in CtrlG), indicating a significant disturbance in sleep quality. In the main group, before the start of rehabilitation, the indicator reached 18.37±1.15 points (256% higher than in CtrlG and 51% higher than in CG). This demonstrates profound sleep disturbances in servicemen with TBI, caused by both physiological and psychoemotional factors, including chronic stress, anxiety, and somatic discomfort. After completing the physical therapy program, the PSQI score in MG decreased by 42.4% (10.58±0.62 points, $p<0.05$).

At the initial examination in CtrlG, the results of the Multidimensional Fatigue Inventory 20 questionnaire showed relatively low values in all subscales: general fatigue – 8 [5; 11] points, physical fatigue – 9 [7; 12], reduced activity – 10 [7; 11], decreased motivation – 8 [6; 10], mental fatigue – 9 [8; 11], which characterizes the baseline level of fatigue in healthy men without dental and neurological dysfunctions (Table 3). In CG, a moderate increase in the indicators was observed: general fatigue – 10 [7; 12] (25% compared to CtrlG), physical fatigue – 10 [9; 12] (12%), reduced activity – 10 [8; 12] (10%), decreased motivation – 9 [7; 11] (12.5%), mental fatigue – 10 [8; 12] (11%).

In MG, before physical therapy, fatigue levels were much higher compared to both CtrlG and CG: general fatigue – 16 [13; 18] points (100% and 60%, respectively), physical fatigue – 15 [13; 18] (66.7% and 50%), decreased activity – 16 [14; 18] (60% and 60%), decreased motivation – 16 [13; 18] (100% and 77.8%), mental fatigue – 15 [12; 17] (66.7% and 50%). These data indicate a significant deterioration in the condition of servicemen with TBI and bruxism compared to both other groups.

The dynamics in MG after physical therapy showed a significant improvement ($p<0.05$): gen-

Table 3

Dynamics of the results of determining the MFI-20 scale in military personnel with the consequences of traumatic brain injury and complicated bruxism under the influence of physical therapy (Me [Q25; Q75])

Scale, points	CtrlG (n=35)	CG (n=32)	MG (n=31)	
			Before physical therapy	After physical therapy
general fatigue	8 [5; 11]	10 [7; 12]	16 [13; 18]*	11 [9; 13]*″
physical fatigue	9 [7; 12]	10 [9; 12]	15 [13; 18]*	12 [9; 15]*″⸭
reduced activity	10 [7; 11]	10 [8; 12]	16 [14; 18]*	11 [10; 13]*″
reduced motivation	8 [6; 10]	9 [7; 11]	16 [13; 18]	10 [8; 12]*″
mental fatigue	9 [8; 11]	10 [8; 12]	15 [12; 17]	12 [10; 14]*″⸭

eral fatigue decreased by 31.3%, physical fatigue by 20%, reduced activity by 31.3%, reduced motivation by 37.5%, mental fatigue by 20%. It should be noted that after therapy, MG indicators became close to CG values or lower (in particular, reduced motivation), which emphasizes the effectiveness of the intervention.

Discussion. The results of our study demonstrated that military personnel with the consequences of closed traumatic brain injury in combination with complicated bruxism and temporomandibular joint dysfunction demonstrate clear signs of astheno-vegetative syndrome, impaired psychoemotional state and significant deterioration of sleep. This is consistent with the data of other authors that after TBI, dysregulation of the sympathetic and parasympathetic branches of the autonomic nervous system and concomitant multisystem dysfunction are often recorded [7].

Our data confirm the concept of multifactorial influence: military context, neurological injury (TBI), dental and orthodontic pathology (bruxism and TMJ dysfunction) are the reasons that create conditions for the formation of chronic sympathicotonia, sleep disorders and fatigue. The literature indicates that bruxism can serve as a marker of increased muscle activity and sympathetic activation in the context of stress or PTSD [11]. It has also been proven that the state of masticatory and facial muscle tone, as well as TMD, correlates with mental state (anxiety, depression) and sleep disorders [10].

Our results demonstrate that after a course of physical therapy, there was a significant improvement in the following indicators: decreased anxiety, depression, improved sleep quality, reduced fatigue, and normalized autonomic balance. This is consistent with the findings of other studies that have shown that therapeutic exercises, relaxation techniques, manual therapy, and breathing exercises effectively affect the musculoskeletal system and the state of the autonomic nervous system [9; 13; 14].

The results obtained (reduction in fatigue scores according to MFI-20, improvement in sleep quality according to PSQI, reduction in anxiety/depression according to HADS) indicate that physical therapy can be an effective means of correcting astheno-vegetative syndrome in military personnel with the consequences of TBI and bruxism. In particular, we recorded a decrease in general fatigue by more than 30%, motivation by almost 40% after the intervention, which is clinically significant ($p<0.05$). This coincides with the data that fatigue is a multidomain phenomenon that correlates with depression/anxiety, and therefore its correction should include physical, psychological and vegetative (autonomic) components.

Conclusions

1. In servicemen with consequences of traumatic brain injury and complicated bruxism, pronounced signs of astheno-vegetative syndrome (predominance of sympathetic activity of the autonomic nervous system according to HRV), a significant deterioration in sleep quality (PSQI), an increased level of anxiety and depression (HADS), as well as a significant increase in physical and mental fatigue indicators (MFI 20) compared to the control group were detected.

2. Physical therapy in combination with splint therapy provides a statistically significant improvement in the studied indicators in

servicemen ($p<0.05$), namely: normalization of vegetative balance due to a decrease in sympathicotonia and an increase in the activity of the parasympathetic link; reduction of psychoemotional stress with a significant decrease in the level of anxiety and depression; improvement in sleep quality and a decrease in the manifestations of disorders associated with bruxism; reducing the severity of general, physical and mental fatigue and increasing activity and motivation.

3. The results obtained confirm the feasibility of a comprehensive approach to the rehabilitation of military personnel with bruxism and the consequences of TBI, aimed at correcting not only dental disorders, but also general systemic consequences of the lesion, which contributes to improving the functional state, psycho-emotional stability and overall quality of life of this category of patients.

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Прийнято до публікації: 21.11.2025
Опубліковано: 31.12.2025
Accepted for publication on: 21.11.2025
Published on: 31.12.2025