ТЕРАПІЯ ТА РЕАБІЛІТАЦІЯ

FEATURES OF THE FUNCTIONING OF THE MAXILLO-FACIAL REGION AND THE TEMPO-MANDIBULAR JOINT IN PATIENTS WITH BRUXISM AND THE POSSIBILITY OF THEIR CORRECTION BY PHYSICAL THERAPY

ОСОБЛИВОСТІ ФУНКЦІОНУВАННЯ ЩЕЛЕПНО-ЛИЦЕВОЇ ДІЛЯНКИ ТА СКРОНЕВО-НИЖНЬОЩЕЛЕПНОГО СУГЛОБА У ПАЦІЄНТІВ З БРУКСИЗМОМ ТА МОЖЛИВОСТІ КОРЕКЦІЇ ЇХ ЗАСОБАМИ ФІЗИЧНОЇ ТЕРАПІЇ

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Abstracts

Purpose is to evaluate the effectiveness of the developed physical therapy program on the functioning parameters of the orofacial zone and the temporomandibular joint as criteria for the effectiveness of the rehabilitation of individuals with bruxism.

Material. The control group consisted of 32 people without burdened dental status. Group 1 consisted of 31 people with bruxism, which was corrected with individual relaxing splints. Group 2 consisted of 32 people with bruxism, in whom, in addition to splints, a physical therapy program was applied: therapeutic exercises, massage, postisometric relaxation, kinesiological taping for masticatory muscles, facial muscles, neck, cervical-collar zone, back, shoulder girdle, transcutaneous electromyostimulation of masticatory muscles; autorelaxation sessions according to Schultz; patient education. The effectiveness of the program was evaluated by the dynamics of complaints, results of dental and general examination, measurement of the amplitude of movements of the lower jaw, the "Hamburg test", the Helkimo index.

Results. In patients with bruxism, signs of dysfunction of the maxillofacial area and the temporomandibular joint were identified in the form of numerous complaints of pain and dysfunction of the orofacial area, chewing disorders, changes in the area of the masticatory muscles, the front and lateral surfaces of the neck and the cervical spine, which supported by the results of the examination, measurement of the amplitude of movements of the lower jaw, the protocol of the "Hamburg test", the Helkimo index. The complex physical therapy program demonstrated a statistically significantly better effect ($p<0.05$) on the studied indicators compared to the initial data; a decrease in the number of complaints, an improvement in the amplitude of movements of the lower jaw, and a decrease in the severity of temporomandibular joint dysfunction were determined. In patients who received an effect only on the peripheral component of bruxism (individual relaxation splints), an improvement in the studied indicators was determined, which in terms of magnitude was inferior to the effectiveness of the developed program of active functional rehabilitation.

Conclusions. In the rehabilitation of patients with bruxism, it is advisable to include measures taking into account and correcting not only local dental, but also general somatic consequences of bruxism, which will improve their quality of life.

Key words: physical therapy, rehabilitation in dentistry, maxillofacial diseases, bruxism, joint dysfunction.

Анотації

Мета – оцінювання ефективності впливу розробленої програми фізичної терапії на параметри функціонування орофаціальної зони та скронево-нижньощелепного суглоба як критеріїв ефективності реабілітації осіб з бруксизмом.

Матеріал. Контрольну групу становили 32 особи без обтяженого стоматологічного статусу. Групу 1 становила 31 особа з бруксизмом, який корегували індивідуальними релаксуючими шинами. Групу 2 становили 32 особи з бруксизмом, у яких додатково до шин застосували програму фізичної терапії: терапевтичні вправи, масаж, постізометричну релаксацію, кінезіологічне тейпування для жувальних м'язів, м'язів обличчя, шиї, шийно-комірцевої зони, спини, плечового поясу, транскутанну електроміостимуляцію жувальних м'язів; сеанси ауторелаксації за Шульцем; навчання пацієнтів. Ефективність програми оцінювали за динамікою скарг, результатів стоматологічного та загального огляду, вимірюванням амплітуди рухів нижньої щелепи, «Гамбургським тестом», індексом Helkimo.

Результати. У пацієнтів з бруксизмом визначено ознаки порушення функціонування щелепно-лицевої ділянки та скронево-нижньощелепного суглоба по типу численних скарг на біль та дисфункцію орофаціальної зони, порушень жування, змін у ділянці жувальних м'язів, передньої та бокових поверхонь шиї та шийного відділу хребта, що підкріплено результатами огляду, вимірюванням амплітуди рухів нижньої щелепи, протоколу «Гамбурзького тесту», індексу Helkimo. Програма комплексної фізичної терапії продемонструвала статистично значуще кращий вплив ($p<0,05$) на досліджувані показники порівняно з вихідними даними; визначено зменшення кількості скарг, покращення амплітуди рухів нижньої щелепи, зменшення вираженості дисфункції скронево-нижньощелепного суглоба. У пацієнтів, які отримували вплив тільки на периферичний компонент бруксизму (індивідуальні релаксаційні спінти), визначено покращення досліджуваних показників, що за своєю величиною поступалося ефективності розробленій програмі активної функціональної реабілітації.

Висновки. У реабілітацію пацієнтів з бруксизмом доцільно включати заходи з урахуванням та корекцією не тільки локальних стоматологічних, але і загальних соматичних наслідків бруксизму, що підвищить якість їхнього життя.

Ключові слова: фізична терапія, реабілітація у стоматології, захворювання щелепно-лицевої ділянки, бруксизм, суглобова дисфункція.

Introduction. Bruxism is a parafunction of the masticatory muscles, stereotypical movements of the lower jaw, accompanied by rubbing or clenching of the teeth, which is more common in young people, although most epidemiological studies show that episodes of bruxism are observed in up to 20% of the adult population [5; 7]. Bruxism not only causes tooth tissue wear, but also causes overstrain of the orofacial muscles and excessive mechanical load on the temporomandibular joint (TMJ). With bruxism, the jaws are involuntarily clenched at night or during the day due to the contraction of the muscles of the maxillofacial area, which are hypertonic [7; 11].

Most researchers believe that the causes of bruxism have not been fully elucidated and attribute the main role in its development to psychosocial factors that impair dopaminergic and other mechanisms of the central nervous system (central theory); its primary and secondary (side effect of drugs) nature [10; 14]. Bruxism is often combined with bite pathology, poor-quality dentures (occlusion theory). Bruxism can be a sign of extrapyramidal side effects of psychotropic drugs. The appearance of symptoms of this disease can occur against the background of taking antidepressants and some other drugs, in particular, for the treatment of Parkinson's disease. Excessive alcohol consumption, smoking can also increase the symptoms of bruxism. There are data on the connection between the manifestations of this disease and functional disorders of the spine [1; 5; 6].

Patients with bruxism complain of pain in the face, TMJ, neck, shoulders and back, ears, paranasal sinuses, as well as complaints of sleep disorders. With sleep bruxism, patients complain of discomfort that appears more often after waking up, and then slowly disappears while awake; with awake bruxism, the opposite dynamics of complaints is determined. Patients indicate a different degree of wear of the hard tissues of the teeth and the need for related systemic dental interventions [7; 9].

Bruxism significantly reduces the quality of life of patients, worsening physical and psycho-emotional comfort, as a result – the social aspect of life suffers. Accordingly, the approach to the correction of these disorders should be multidisciplinary, with the participation of neurologists, dentists, maxillofacial surgeons, somnologists, psychiatrists and rehabilitation specialists, in particular, physical therapists [2; 12]. Means of physical therapy are highly effective safe means with physiological effects affecting joint and muscle dysfunctions of various origins [3; 4; 8], mental status of patients, effective in dental diseases [2; 13].

The widespread prevalence of bruxism and the lack of coverage of the problem of its correction by rehabilitation methods, in particular, by means of physical therapy, determined the relevance of the presented work.

The purpose of the study is to evaluate the effectiveness of the developed physical therapy program on the functioning parameters of the orofacial zone and the temporomandibular joint as criteria for the effectiveness of the rehabilitation of people with bruxism.

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

Inclusion criteria: bruxism of the I–II degree with a decrease in the height of the tooth row, diagnosed according to the criteria of the American Academy of Sleep Medicine (2005); full set of teeth (excluding third molars); consent to participate in the study.

Exclusion criteria: medication or symptomatic bruxism; presence of acute or exacerbation of chronic somatic or mental pathology at the time of examination; partial loss of teeth; the presence of orthopaedic structures in the oral cavity; history of botulinum toxin injections.

The control group (CG) consisted of 32 people (15 men, 17 women) aged 28.3 ± 2.7 years without severe dental status (bruxism, TMJ dysfunction, inflammatory processes of oral cavity tissues, etc.).

The group of examined persons with bruxism consisted of 63 persons, who were divided into two subgroups by a blind randomized method.

Group 1 (GR1) consisted of 31 people (13 men, 18 women) aged 25.2±1.4 years with bruxism, the symptoms of which were reduced by wearing individually made relaxing occlusive splints.

Group 2 (GR2) consisted of 32 people (13 men, 19 women) aged 25.6±2.3 years with bruxism who underwent a developed rehabilitation program, which included not only wearing individual relaxing occlusive splints, but also the use of a physical therapy program (FT). The physical therapy program was designed for three months; during the first intervention, it was carried out on the basis of the rehabilitation center; in the future – in a mixed format – remotely and independently, with periodic personal supervision by a physical therapist. The program included therapeutic exercises with the OraStretch® Press System simulator, exercises for the muscles of the face, neck, cervical collar zone, back, shoulder girdle, breathing exercises, relaxation exercises; a course of intraoral and classical massage of the masticatory muscles, maxillofacial area, neck, cervical collar zone; transcutaneous electromyostimulation of masticatory muscles; post-isometric relaxation of masticatory muscles, neck muscles and cervical collar zone; kinesiological taping of the maxillofacial area, masticatory muscles, neck; autorelaxation sessions according to Schultz; teaching the patient the principles of self-control of his psycho-emotional state and unwanted movements of the lower jaw while awake, active conscious avoidance of stressful situations, cessation of smoking (if available). Measures aimed at psycho-emotional relaxation and reduction of muscle tone of the orofacial and cervical collar zone were carried out in the second half of the day or in the evening. The purpose of the developed physical therapy program was: reducing the degree of psycho-emotional stress and normalizing sleep; normalization of the autonomic nervous system; normalization of the strength and tone of the muscles of the face (chewing and facial expressions) and neck; reduction of local discomfort; leveling of trigger zones (face, neck, cervical collar zone), half-improvement of the functioning of the maxillofacial area.

Re-examination of people with bruxism was carried out after three months – the duration of the implementation of the physical therapy program and the use of individual caps.

The effectiveness of the developed program was evaluated by the dynamics of clinical signs of bruxism and TMJ dysfunction. We determined the prevalence of complaints – pain syndrome (in TMJ, head, masticatory muscles, neck), disorders of the maxillofacial area (involuntary clenching of teeth, grinding of teeth, increased sensitivity of teeth, sound phenomena in TMJ, discomfort when chewing hard and dense food, restriction of mouth opening, "uncomfortable" position of the lower jaw), psycho-emotional disorders (sleep disorders, psycho-emotional depression).

During the examination, hypertrophy of the masticatory muscles ("square" jaw), decrease in the height of the tooth row, defects in tooth enamel, disorders in the process of lowering the lower jaw (opening the mouth) were determined – intermittent, deviation or lateral displacement of the lower jaw when opening the mouth.

The amplitude of movements in the temporomandibular joint was determined (the amount of mouth opening – the distance between the cutting edges of the central incisors of the upper and lower jaws at maximum mouth opening, lateral deviation of the lower jaw).

The severity of TMJ dysfunction was determined according to the "Hamburg test" protocol (M.O. Ahlers, H.A. Jakstat, 2000) according to the following criteria: asymmetric opening of the mouth; limited opening of the mouth or excessive opening of the mouth; the presence of intra-articular noises; asynchrony of the occlusal sound when closing the teeth; soreness when palpating the masticatory muscles; traumatic nature of eccentric occlusion of dental rows. The presence of 0–1 of the listed signs was considered as the norm, the presence of 2 signs – a risk group of disfunction, and the presence of 3 or more signs was considered as a finding of TMJ dysfunction.

The clinical picture of TMJ dysfunction was also characterized by the definition of the Helkimo index (M. Helkimo, 1976), which evaluated the symptoms of mobility of the lower jaw, TMJ, muscle and joint pain according to the score. The result was described as 0 points – no dysfunction; 1–4 points – mild dysfunction; 5–9 points – dysfunction of moderate severity; 10–25 points – severe dysfunction.

The study was conducted taking into account the principles of the Helsinki Declaration of the World Medical Association "Ethical principles of medical research involving a person as an object of research". Informed consent was obtained from all patients with bruxism and healthy individuals involved in the present study. The research protocol was discussed and approved at the meeting of the Bioethics Commission of Vasyl Stefanyk Precarpathian National University.

In the process, the Shapiro-Wilk Criterion (W) was used in order to check the conformity of the type of distribution of quantitative indicators with the law of normal distribution. In the presence of a normal distribution of research results, the Student's t-test was used to assess the significance of the difference (for dependent or independent groups). The Wilcoxon test (for dependent groups) and the Mann-Whitney U-test (for independent groups) were used for indicators characterized by a distribution other than normal. The median (Me), upper and lower quartiles (25%: 75%), mean value (x) and standard deviation (S) were calculated for indicators that had a distribution other than normal. Differences at $p<0.05$ were considered statistically significant.

Research results. Dysfunction of the orofacial zone of people with bruxism was manifested in the form of a pain syndrome – most often headache and TMJ pain (more than 90%), neck pain and dental pain were defined somewhat differently (Table 1). Bruxic manifestations were determined in the form of involuntary clenching and grinding of teeth (90–100%) and increased sensitivity to temperature and chemical composition (sour, sweet foods) of food associated with increased stress on the teeth. In most of the examined donkeys with bruxism, signs of TMJ dysfunction and related occlusion disorders were determined, apparently due to its overload - sound phenomena in the TMJ, discomfort when chewing food, restriction of mouth opening, "uncomfortable" position of the lower jaw (from 50% to 80%). Complaints about sleep disturbances and psycho-emotional depression were very common (70–90%) (Table 1).

Table 1

Dynamics and structure of revealed complaints in persons with bruxism under the influence of a physical therapy program

Symptom	CG (n=32), % (absolute number)	GR1 (n=31), % (absolute number)		GR2 (n=32), % (absolute number)	
		First examination	Re-examination	Before physical therapy	After physical therapy
headache	12.5 (4)	96.8 (30)*	45.2 (14) *°	93.8 (30)*	12.5 (4) *°″
TMJ pain	0	93.5 (29)*	64.5 (20) *°	93.8 (30)*	9.4 (3) *°″
toothache	0	51.6 (16)*	16.1 (5) *°	46.9 (15)*	12.5 (4) *°″
neck pain	15.6 (5)	74.2 (23)*	45.2 (14)*°	68.8 (22)*	18.8 (6) *°″
involuntary clenching of the teeth	0	100 (31)*	64.5 (20) *°	100 (32)*	18.8 (6) *°″
teeth grinding	0	90.3 (28)*	51.6 (16) *°	87.5 (28)*	9.4 (3) *°″
increased sensitivity of the teeth	12.5 (4)	93.5 (29)*	45.2 (14) *°	96.9 (31)*	31.3 (10)*°″
sound phenomena in TMJ	0	80.6 (25)*	51.6 (16) *°	81.3 (26)*	15.6 (5) *°″
discomfort when chewing food	0	77.4 (24)*	54.8 (17) *°	75.0 (24)*	18.8 (6) *°″
restriction of mouth opening	0	64.5 (20)*	45.2 (14) *°	59.4 (19)*	25.0 (8) *°″
“uncomfortable” position of the lower jaw	0	58.1 (18)*	38.7 (12) *°	65.2 (20)*	25.0 (8) *°″
sleep disturbance	15.6 (5)	90.3 (28)*	67.7 (21) *°	87.5 (28)*	15.6 (5) *°″
psychoemotional oppression	18.8 (6)	77.4 (24)*	64.5 (20) *°	71.6 (23)*	12.5 (4) *°″

Note: * – statistically significant difference compared to the value of the corresponding parameter of CG persons ($p<0.05$);

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

″ is a statistically significant difference in comparison with the corresponding parameter of individuals GR1 ($p<0.05$).

When determining the dental status of 100% of people with bruxism, a decrease in the height of the tooth row, defects in tooth enamel (treated accordingly) were determined (Table 2). Evidence of bruxism was visually determined hypertrophy of the masticatory muscles (more than 70%). TMJ dysfunction was manifested in the form of violations of the biomechanics of lowering the lower jaw (intermittent opening of the mouth 30–35%, deviation of the lower jaw (50%), lateral displacement of the lower jaw (20%) (Table 2).

During the initial examination of patients with bruxism, limitation of the amplitude of movements in the TMJ was established based on the ability to open the mouth (15% worse than CG) and shift the jaw to the side (44% worse than CG) (Fig. 1), which is associated with clinical signs of TMJ dysfunction. The lack of normal amplitude of jaw movement can lead to deterioration of the functions of biting, chewing and swallowing, negatively affecting the quality of life of patients.

The results of the “Hamburg test” characterized multiple signs of TMJ dysfunction in individuals with bruxism (Table 3). In fact, all patients had tenderness during palpation of the masticatory muscles (95–10%); signs of intra-articular noises, traumatic eccentric occlusion, changes in the amplitude of mouth opening were very common (75–85%). TMJ dysfunction was also defined as asymmetry when opening the mouth and asynchrony of the occlusal ring when opening the mouth (65%). The general result of the “Hamburg test” testified to the pronounced TMJ dysfunction in the examined persons (the overall score was equal to 5 on average).

The parameters of the Helkimo index corresponded with the complaints submitted by the patients and demonstrated the presence of TMJ dysfunction in the examined patients of

Table 2

Dynamics of general and dental examination results in individuals with bruxism under the influence of a physical therapy program

Sign	CG (n=32), % (absolute number)	GR1 (n=31), % (absolute number)		GR2 (n=32), % (absolute number)	
		First examination	Re-examination	Before physical therapy	After physical therapy
decrease in the height of the tooth row	0	31 (100)*	31 (100)*	31 (100)*	31 (100) *
tooth enamel defects	6 (18.8)	31 (100)*	31 (100) *°	31 (100)*	31 (100)*
hypertrophy of masticatory muscles	0	74.2 (23)*	67.7 (21) *°	78.1 (25)*	65.2 (20) *°″
intermittent opening of the mouth	0	32.2 (10)*	19.4 (6) *°	34.4 (11)*	0°″
deviation of the lower jaw	5 (15.6)	48.4 (15)*	38.7 (12) *°	50.0 (16)*	15.6 (5) *°″
lateral displacement of the lower jaw when opening the mouth	2 (6.3)	19.4 (6)*	12.9 (4) *°	21.9 (7)*	3.1 (1)°″

Note: * – statistically significant difference compared to the value of the corresponding parameter of CG persons ($p<0.05$);

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

″ is a statistically significant difference in comparison with the corresponding parameter of individuals GR1 ($p<0.05$).

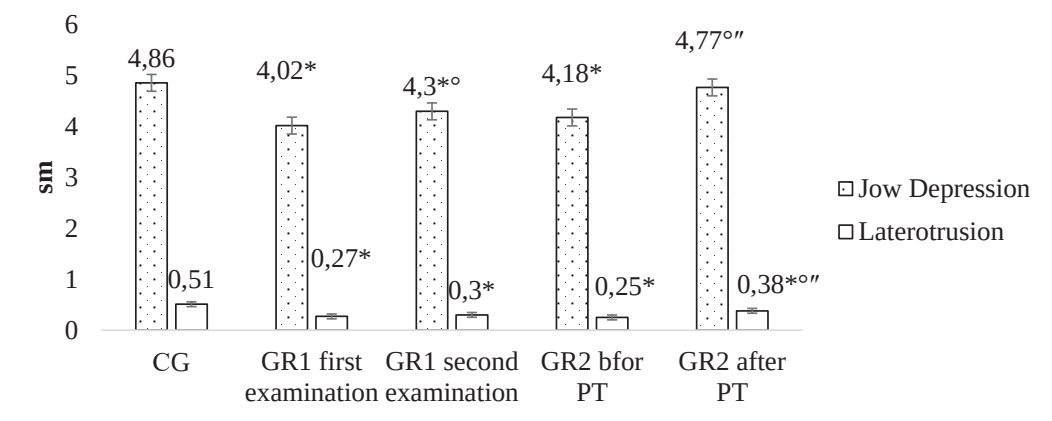

Fig. 1. Dynamics of the amplitude of movements of the lower jaw in persons with bruxism under the influence of rehabilitation measures (x±S) (* – statistically significant difference compared to the value of the corresponding parameter of CG persons ($p<0.05$); ° – statistically significant difference compared with the parameter of the primary examination ($p<0.05$); ″ is a statistically significant difference in comparison with the corresponding parameter of persons GR1 ($p<0.05$))

an average degree of severity: in GR1 – 7.28± 0.12 points, in GR2 – 7.11±0.15 points ($p>0.05$), which also substantiated the need for a complex corrective intervention aimed at correcting the peripheral component of bruxism (Fig. 2).

The data obtained during the preliminary examination became the justification for the selection of physical therapy methods and the need for their active functional focus on the correction of the detected signs of bruxism, in particular, with the aim of reducing the muscle tone of the masticatory muscles, their relaxation to help normalize the pressure in the TMJ and reduce the symptoms its dysfunctions.

Table 3

The dynamics of detecting the frequency of positive signs of the "Hamburg test" in patients with bruxism under the influence of rehabilitation measures

Sign	CG (n=32), % (absolute number)	GR1 (n=31), % (absolute number)		GR2 (n=32), % (absolute number)	
		First examination	Re-examination	Before physical therapy	After physical therapy
asymmetric opening of the mouth	0	64.5 (20)	45.2 (14)	68.8 (22)	15.6 (5)
limited or excessive opening of the mouth	9.4 (3)	74.2 (23)	48.4 (15)	65.6 (21)	12.5 (4)
the presence of intra-articular noises	0	80.6 (23)	51.6 (16)	81.3 (26)	15.6 (5)
asynchrony of the occlusal sound when closing the teeth	0	64.5 (20)	45.2 (14)	65.6 (21)	21.9 (7)
soreness during palpation of the masticatory muscles	15.6 (5)	100 (31)	58.1 (18)	96.9 (31)	0
traumatic nature of eccentric occlusion of tooth rows	0	83.9 (26)	38.7 (12)	87.5 (28)	18.8 (6)
Average ME score (25; 75)	0 [0; 1]	5 [5; 6]*	4 [4; 5]*°	5 [5; 6]*	2 [1; 2]*°″
Average score (x±S)	0.63±0.05	5.12±0.08*	3.21±0.16*°	5.01±0.12*	2.05±0.07*°″

Note: * – statistically significant difference compared to the value of the corresponding parameter of CG persons ($p<0.05$);
° – statistically significant difference compared to the parameter of the first examination ($p<0.05$);
″ is a statistically significant difference in comparison with the corresponding parameter of individuals GR1 ($p<0.05$).

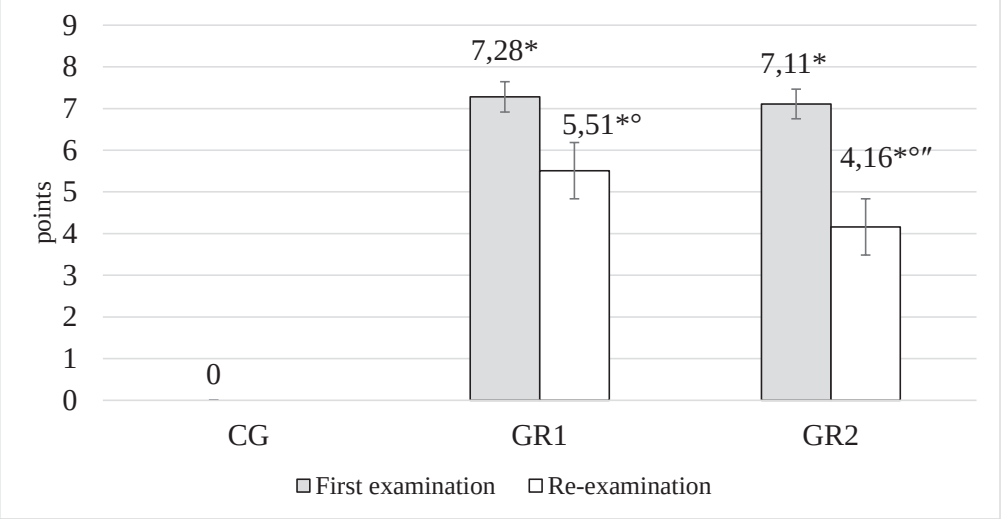

Figure. 2. Dynamics of the Helkimo index results in patients with bruxism under the influence of the physical therapy program (x±S) (* – statistically significant difference compared to the value of the corresponding parameter of CG individuals ($p<0.05$); ° – statistically significant difference in compared with the parameter of the primary examination ($p<0.05$); ″ is a statistically significant difference compared with the corresponding parameter of GR1 ($p<0.05$))

Considering the lack of difference between the indicators of group 1 and group 2 at the initial examination (homogeneity of the contingent), the results diagnosed at the repeated examination proved the effectiveness of the applied physical therapy.

When clarifying complaints, it was found that the pain syndrome decreased in both groups, but with a certain difference in favour of the use of physical therapy (Table 1): the frequency of TMJ pain detection decreased in GR1 subjects by 29.0%, GR2 by 50.0% ($p<0.05$), headache – by 51.6% and 81.3% ($p<0.05$), toothache – by 35.5% and 34.4% ($p<0$, 05), neck pain – by 29.0% and 84.4% ($p<0.05$). Bruxism symptoms decreased: involuntary teeth clenching was diagnosed less often in GR1 by 35.5%; GR2 – by 81.3% ($p<0.05$), teeth grinding – by 38.7% and 78.1% ($p<0.05$), respectively; increased tooth sensitivity – by 48.4% and 65.6% ($p<0.05$). Subjective manifestations of TMJ dysfunction also decreased: sound phenomena in the TMJ were detected in GR1 by 29.0% less often, in GR2 by 65.6% ($p<0.05$); discomfort when chewing food – by 22.6% and 56.3% ($p<0.05$), respectively, restriction of mouth opening – 19.4% and 34.4% ($p<0.05$), "uncomfortable" position of the lower jaws – 19.4% and 37.5% ($p<0.05$). Also, the frequency of sleep disturbances decreased in patients – in GR1 by 22.6%, in GR2 – by 71.9% ($p<0.05$), and the frequency of detection of psycho-emotional depression decreased – by 12.9% and 59.4%, respectively ($p<0.05$).

The results of the review underwent changes (Table 2). Hypertrophy of the masticatory muscles visually decreased in GR1 individuals by 6.5%, GR2 – by 15.6%. The biomechanics of the movement of the lower jaw improved – the determination of the intermittent amplitude of mouth opening in GR21 individuals decreased by 12.9%, GR2 – by 34.4% ($p<0.05$), deviations of the lower jaw – respectively by 9.7% and 34.4% ($p<0.05$), lateral displacement of the lower jaw when opening the mouth – by 6.5% and 18.8% ($p<0.05$).

The amplitude of mouth opening increased under the influence of rehabilitation in GR1 by 7%, GR2 by 14.1%, laterotrusion by 11.1% and 52.0%, respectively (Fig. 1).

The improvement of the condition of patients with bruxism was determined by the dynamics of the components of the "Hamburg test" (Table 3). Asymmetry of mouth opening in GR1 was determined by 19.4% less often, in GR2 by 53.1% ($p<0.05$); changes in the amplitude of mouth opening – by 25.8% and 53.1%, respectively ($p<0.05$); detection of the frequency of intra-articular noises – by 29.0% and 65.6% ($p<0.05$); asynchrony of the occlusal sound when closing the teeth – by 19.4% and 43.8% ($p<0.05$); pain during palpation of masticatory muscles – by 41.9% and 96.9% ($p<0.05$); the traumatic rate of eccentric occlusion of tooth rows – by 45.2% and 68.8% ($p<0.05$). The overall decrease in expression of TMJ dysfunction according to the "Hamburg test" in individuals with bruxism was 37.35% in GR1, 59.1% in GR2.

The improvement of the TMJ condition according to the Helkimo index in GR1 was 24.3%, remaining at the lower limit of moderate dysfunction (Fig. 2). In GR2 individuals, the improvement was 41.5%, reaching the level of mild TMJ dysfunction.

The efficiency of using splint therapy in people with bruxism was demonstrated for all the investigated indicators (statistically significant improvement compared to the initial indicator). However, the means of physical therapy potentiated the effect of using splints, which proves the expediency of their use and the process of dental interventions.

Discussion. Many authors believe that the key link in the development of TMJ dysfunction is the discoordination of masticatory muscle activity, which leads to a change in the mutual location of the intra-articular discs and the heads of the lower jaw [5; 9]. The development of TMJ dysfunction can be caused by the functional load on the teeth caused by maxillofacial anomalies, the loss of a large number of teeth, as well as the parafunction of the masticatory muscles – bruxism [10]. Hypertonus and parafunction of the masticatory muscles contribute to the emergence of functional load and can cause long-term non-functional sliding movements of the lower jaw relative to the upper jaw when the teeth are closed [11].

Currently, the problem of bruxism is becoming more widespread due to the increase in stress in society. Grinding teeth is an evolutionarily developed protective reaction in a stressful

situation, which allowed to defend against predators and grind food. Constant stress leads to long-term contraction of chewing muscles, pain in the head and joints, tinnitus, clicking and asynchronous muscle contraction [12; 14]. With prolonged spasm of the lateral pterygoid muscle, the strong connection of the meniscus with the condyle is lost. With asynchronous movement of the articular heads, the meniscus becomes mobile and, changing its position, emits a characteristic sound at various stages of opening the mouth [5]. With functional disorders in the maxillofacial region, the mental state of the patient may change [6; 7]. This pathology is capable of leading to habitual chronic dislocations of the meniscus, so it is important to start treatment at the initial manifestation of symptoms of TMJ neuromuscular syndrome with bruxism. One of the types of complex intervention for pain dysfunctions is physical therapy.

The use of physical therapy in the early stages of bruxism and TMJ dysfunction gives quick positive results. In particular, kinesitherapy is easy to perform and does not require additional financial costs. Teaching patients in the process of physical therapy allows patients to learn more about muscle dysfunction, about the etiology and factors of the occurrence of parafunction and to learn to control the motor activity of muscles. Therapeutic exercise and massage can reduce the degree of psycho-emotional depression during stress and improve the function of the orofacial zone [2; 13].

Conclusions.

1. In patients with bruxism, dysfunction of the maxillofacial area and temporomandibular joint was determined by the type of numerous complaints about pain and dysfunction of the orofacial area, chewing disorders, changes in the area of the masticatory muscles, the front surface of the neck and the cervical spine, which supported by the results of the examination, the results of the measurement of the amplitude of the movements of the lower jaw, the protocol of the "Hamburg test", and the determination of the Helkimo index.

2. Implementation of a comprehensive program of physical therapy using therapeutic exercises, massage, postisometric relaxation, kinesiological taping for masticatory muscles, muscles of the face, neck, cervical collar zone, back, shoulder girdle, transcutaneous electromyostimulation of masticatory muscles; autorelaxation sessions according to Schultz; training of patients against the background of the use of individual eye drops revealed a statistically significant improvement in the condition of patients with bruxism according to the studied indicators.

3. In patients who received an effect only on the peripheral component of bruxism (individual relaxation splints), an improvement of the studied indicators was determined, which in terms of magnitude was inferior to the effectiveness of the developed program of active functional rehabilitation.

4. In the rehabilitation of patients with bruxism, it is advisable to include measures taking into account and correcting not only local dental, but also general somatic consequences of bruxism, which will improve their quality of life.

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