

MUSCULOSCELETAL DYSFUNCTION OF THE TEMPOROMANDIBULAR JOINT, INDICATORS OF ELECTROMYOGRAPHIC EXAMINATION, BEFORE AND AFTER TREATMENT OF COMPLICATED DENTAL AND MAXILLARY ANOMALIES

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Annotation: *This article presents the results of a study of the biopotentials of the masticatory muscles. All indicator of the myograph was noted by the author of this article for the period before and after treatment for temporomandibular joint (TMJ) dysfunctions complicated by dental and maxillary anomalies. The obtained electromyographic indicators of the masticatory muscles before and after treatment not only affect the outcome of the correct treatment of the patient and the normalization of the activity of the musculoskeletal system, masticatory muscles and TMJ, but also reveal a complete picture of the functional state of this system.*

Key words: *dental and jaw anomalies, temporomandibular joint, musculoskeletal dysfunction, masticatory muscles, electromyography.*

Relevance. There are several etiopathogenetic theories about the origin of musculoskeletal dysfunction (TMJ), such as: myofascial pain syndrome, musculoarthropathy, musculoarticular dysfunction, temporomandibular joint dysfunction syndrome, occlusive articulation disorders. (1, 2, 6, 9).

The most popular among most authors are the theories of the occurrence of musculoskeletal dysfunction of the TMJ: "neurogenic", "occlusive articulation" and "myogenic".

Researchers from domestic and foreign countries (5, 7, 8, 11) identify three main etiological factors in the development of TMJ dysfunction of a musculoskeletal nature: physical, emotional stress, and occlusive disharmony (3, 4, 10). The interaction of these main triggering factors leads to hyperfunction and spontaneous contraction of the masticatory muscles, which causes their rapid fatigue, pain, restriction of movements of the lower jaw (17, 13, 15).

It has been established by other researchers (12,14,16,18) that disorders of the function of the neuromyogenic complex are caused by a number of causal factors: premature contacts and supercontacts, errors and complications in dental prosthetics, lesions of the central nervous system, mental factor, which can also be combined into a set of occlusive and psychogenic disorders.

The purpose of this study is to assess the functional state of the masticatory muscles using an electromyograph in healthy people and those suffering from TMJ dysfunction.

Material and methods. The study of graphic bioelectric activity of the masticatory muscles with a four-channel adaptive electromyograph for dental research "Synapsis" by NEUROTECH (Taganrog) was carried

out in a control group of 18-24 years old 22 people with intact dentation, and in the main group suffering from musculoskeletal dysfunction of the TMJ. Last one include 23 people. All the research was carried out by us at the Bukhara State Medical Institute in the Department of Orthopedic Dentistry and Orthodontics. During research work 45 MG was obtained.

To research the dynamics of changes in the neuromotor apparatus and the synchronicity of the masticatory muscles, the study was conducted before treatment and 4 months after treatment with the use of splints or other temporary orthopedic structures. The resulting electromyograms were received and analyzed using the surface electromyograph called "Synapsis" and software. The method is based on the registration of total EMG, which is formed as a result of the interference of vibrations of several motor units of the muscle located in the withdrawal zone.

Results and discussions. Myography was used and changes in the functional state of the neuromuscular apparatus were determined in the control and main group of patients before and after treatment, in each case the examinee was previously trained and sat on the plane of the tragus-wing of the nose, after which a record was obtained of the actual masticatory and temporal muscles at rest and with maximum jaw compression.

Before the start of treatment and 4 months later, both groups were examined. Therapy to restore functional occlusion was carried out both with the help of occlusal splints and various orthopedic structures for patients from the main group. The number of people surveyed was 45 people in all.

According to the average amplitudes of bioelectric activity, we evaluated the results of electromyography in a state of functional rest in the masticatory muscles. It was determined that in the control group the arithmetic mean values of the amplitude of the right temporal muscle were 30.47 ± 11.93 mv, left - 29.55 ± 11.46 mv, right chewing - 25.59 ± 11.25 mv, left chewing - 20.47 ± 7.59 mv.

Also, the temporal muscles in the main group had high values of the amplitude of bioelectric activity (significance level $p < 0.009$) before treatment. In this study group, there were patients with an amplitude reaching 659.8 MV, and in the control group this value did not exceed 62.5 MV. In these patients, the amplitude of spontaneous bursts in the temporal muscle on the left reached 600 MV before the start of treatment. The maximum amplitude in the masticatory muscles was within 1269.6 mv.

At 4 months after the start of treatment in patients of the main group, the average values of the right temporal muscle became 34.93 ± 20.9 mv, the left - 35.9 ± 18.86 mv, the right masticatory - 30.15 ± 17.09 mv, the left masticatory - 26.76 ± 16.59 mv. The maximum amplitude of bioelectric activity in the masticatory muscles in the main group after treatment reached - 135.4 MV, in the temporal - 190 mv.

After the complex temporary orthopedic and orthodontic treatment, a decrease in spontaneous bursts was observed.

The average values of the maximum amplitude of the right temporal muscle in the control group were 857.88 ± 361.16 mv, the left - 842.88 ± 500.59 mv, the right masticatory - 659.09 ± 458.68 mv, the left masticatory - 681.16 ± 717.35 mv. The average values of the maximum amplitude in the corresponding muscles in the main group were 1301.15 ± 999.66 MV, 1451.13 ± 1249 mv, 1128.92 ± 985 mv, 1292.66 ± 965.38 mv before the start of our treatment. After 4 months the treatment of patients in the main group, the maximum amplitudes of bioelectric activity of the temporal and masticatory muscles already was nearly and approach the values of the control group ($p < 0,009$).

The average electrophysiological activity of these two muscles during compression of the dentition in the main group of patients complicated by dental anomalies before treatment was characterized by high amplitude indices: the right temporal muscle 273.7 ± 198.6 mv, the left - 255 ± 182.3 mv, the right chewing

289.4 ± 628 mv, the left - 232.3 ± 148.9 mv. These indicators in the control group in the masticatory and temporal muscles were as follows: 145.3 ± 100.3 mv, 148.9 ± 108 mv, 141.8 ± 212.2 mv, 148.3 ± 204.8 mv.

In the control group complicated by dental and maxillary anomalies and in the group of patients of the main group after complex treatment, the results showed that the average amplitude of the bioelectric activity of the masticatory muscles approached ($p < 0.009$): the average amplitude of the right temporal muscle was 170 ± 45.32 mv, the left - 165.16 ± 48.46 mv, the right masticatory - 212.71 ± 87.85 mv, left - 210.55 ± 91.59 mv.

In patients of the main group, after the treatment, the coordination and synchronicity of the work of the two masticatory and temporal muscles is restored when the dentition is compressed in the usual occlusion. In the control group, the average value of the ICTM was 94.09%, while this indicator ranged from 72 to 137%. Before treatment, the average value of this indicator in the main group was 120.52%, the minimum was 33%, and the maximum was 287%. In the range of the control group (70-138%), 6 people (26.08%) had the value of ICMM, and 17 people (72.91%) went over this interval in a greater or lesser direction.

Through 4 months, after treatment which was held, the average value of IIB in the main group was 95.09%, the minimum was 56%, the maximum was 154%. And already in 13 patients (70%) was in the range of the control group of the ICTM, and the value of the ICTM went beyond this interval in 9 (30%). In the control group, the average value of the heart rate was 95.5%, the minimum - 71%, the maximum - 134%. Before treatment, the values in the main group were 32-207%, but 95.1% had an average value. The average value of ICMM in patients of the main group complicated by dental anomalies, after treatment, was 108.3%, the minimum - 59%, the maximum - 149%. And in 14 people (63.63%) this range was within the control group, but in 8 people (36.36%) it went beyond it.

Conclusions. One of the positive effects of treatment of patients of the main group is the restoration of symmetry of bioelectric activity and normalization of their function of the muscles under study.

Analyzing the obtained electromyograms and their data, it was found that in patients of the main group, the muscles are in a functional state.

The complex treatment also led to the ordering of the contractile activity of the masticatory muscles, the symmetry of bioelectric discharges and the elimination of symptoms in the main group of patients not only at the subjective level, but also according to electromyography indicators. In order to restore the dynamic and functional state of the studied muscles, synchronization and coherence during the work of these muscles in the patient, occlusion therapy leads the study.

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