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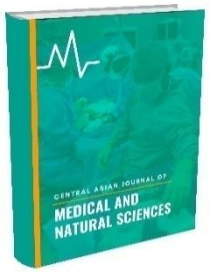

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Myographic Studies of Musculoarticular TMJ Dysfunctions Complicated by Medial Occlusion in Children

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Annotation: This article presents the results of a study of the biopotentials of the masticatory muscles in children. The authors recorded each indicator of the electromyograph of articular dysfunctions of the temporomandibular joint in the course of their research with their own hands. Electromyographic studies of the masticatory muscles affect the diagnosis of the disease and normalize the activity of the masticatory apparatus and TMJ, as well as reveal the completeness of the picture of the functional state of the muscles.

Keywords: dental anomalies, temporo-mandibular joint, musculoskeletal dysfunction, masticatory and temporal muscles, electromyography.

Relevance. There are a number of etiopathogenetic theories of the origin of the musculoskeletal dysfunction of the temporomandibular joint and the terms that formulate this form disease. (1, 2, 7, 9).

The most popular among these theories are: "occlusal articulation", "muscular" and "psychogenic".

Many researchers (5, 6, 8, 10) believe that there are three main etiological factors in the development of musculoskeletal dysfunction of the TMJ: physical, emotional stress, and occlusive disharmony (3, 4, 11). The interaction of these factors leads to hyper function of the masticatory muscles, which causes their rapid fatigue, pain, restriction of movements of the lower jaw (17, 13, 15).

Other researchers (12,14,16) found that disorders of the neuromuscular complex function are caused by a number of causal factors: premature contacts, errors in prosthetics, lesions of the central nervous system, psychogenic factor, which can also be combined into a set of occlusive and mental disorders.

Thus, analyzing the importance of the functional state of the masticatory muscles, we conducted this study of bioelectric activity with the help of electromyography.

Material and methods. On the basis of the Department of Orthopedic Dentistry and Orthodontics of the Bukhara State Medical Institute, we conducted a study of the bioelectric activity of the masticatory muscles with a four-channel adaptive electromyograph for dental research "Synapsis" by NEUROTECH (Taganrog) to 30 individuals from the control group, 30 patients with musculoskeletal dysfunction of the TMJ complicated by dental and maxillary anomalies, before and after treatment. A total of 30 EMG children were received.

To obtain the research material, permission was obtained by the Bukhara City Department of Public Education, and a preventive examination was carried out to identify malocclusion and TMJ dysfunction in schools No. 7 and 16.

For the surface EMG examination, we used a number of functional tests aimed at detecting the bioelectric activity of the masticatory muscles during function, as well as at rest of the lower jaw.

Results and discussions. To solve the tasks set for the study, 60 patients from 7 to 15 years old who applied for dental treatment were examined. All patients were divided into 2 groups. The control group consisted of 30 patients aged 7-15 years with intact dentition, as well as the main group of 30 patients with musculoskeletal TMJ dysfunction complicated by medial occlusion, aged 7-15 years. The study was conducted in the "Center of Dentistry" on the basis of the Department of Orthopedic Dentistry and Orthodontics of the Bukhara State Medical Institute. We conducted a study of the bioelectric activity of the masticatory muscles (actually masticatory and temporal) with a four-channel adaptive electromyograph for dental research "Synapsis" by NEUROTECH (Taganrog) to 30 individuals from the control group with dental and maxillary anomalies, before and after treatment. A total of 60 EMG were received.

In each case, the subject was previously trained in the movement performed (AF and MO states) and sat with the orientation of the head along the Camper line 1 (tragus-wing of the nose), a recording of the temporal, masticatory muscles was obtained, between each recording, in order to avoid signs of fatigue or exhaustion, there was a rest time for 45 seconds to a minute .

The following objective characteristics were included in the EMG protocol: biomiographic arithmetic mean muscle activity, the state of physiological rest relatively; the average mcV of the LM and VM at maximum bite.

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 AF control group, the arithmetic mean values of the amplitude of the right temporal muscle were 15.1 ± 0.5 mv, the left – 12.2 ± 0.4 mv, the right chewing - 13.5 ± 0.3 mv, the left chewing - 12.6 ± 0.6 mv.

The masticatory muscles in the main group also had high indices of maximum amplitudes of bioelectric activity (significance level $p < 0.01$). In this group, there were patients with an amplitude reaching 903 MV (with maximum occlusion), and in the control group this value did not exceed 404 MV. In children of the main group, the maximum amplitude of spontaneous bursts in the masticatory muscle on the right is up to the beginning of 598 MV. The maximum amplitude in the masticatory muscles was within 965 mv.

In patients of the main group, spontaneous muscle activity was observed on electromyographic indicators for AF of the masticatory and temporal muscles, as well as in these muscles with maximum jaw compression.

The average values of the maximum amplitude of the right temporal muscle in the control group were 453.9 ± 1.2 mv, left - 458.9 ± 1.6 mv, right chewing - 456.7 ± 2.7 mv, left chewing - 445.6 ± 717.4 mv.

Consequently, it has been statistically established that patients of the main group have higher maximum amplitudes of bioelectric muscle activity with strong-willed jaw compression.

In the main group of patients complicated by medial occlusion, the average electrophysiological activity of the masticatory and temporal muscles during compression of the dentition was characterized by high amplitude indices: the right temporal muscle 272.7 ± 198.6 mv, the left - 257 ± 182.3 MV, the right masticatory 282.4 ± 622 mv, the left - 231.3 ± 142.9 MV. In the control group,

these indicators in the corresponding muscles were as follows: 143.3 ± 103.3 MV, 145.9 ± 103 MV, 139.8 ± 214.2 MV, 141.3 ± 202.8 MV.

Conclusions. Analyzing the obtained electromyography data, it was found that in patients of the main group, the LM and VM are in a state of functional overload. Also creating an imbalance in the masticatory muscles, high-amplitude and asymmetric bioelectric activity, leading to muscle spasms and tension, is characteristic of patients of the main group during the period of compression of the dentition. In addition, spontaneous activity of the chewing muscles (22% among the main group) and "bad habits" in the form of biting lips, cheeks and foreign objects (23.7%) were revealed. The feeling of fatigue of the chewing muscles when eating was also a characteristic feature for people with TMJ syndrome (12.5% of the main group)

Examination of the main group showed that the following can be attributed to early clinical signs of TMJ syndrome: a change in the nature of movement of the articular heads, the presence of asymmetry, as well as spontaneous contraction of the LM and VM and painful palpation in some muscles. In addition, various malocclusion anomalies were found in patients suffering from musculoskeletal TMJ dysfunction, and only the medial occlusion was isolated.

The results of the conducted studies and their analysis made it possible to develop a comprehensive methodology for the early diagnosis of TMJ muscular-articular dysfunction syndrome based on a thorough clinical examination of patients, to establish muscle asymmetry using surface electromyography of the masticatory and temporal muscles proper; to study and pathological asymmetry of the facial skeleton using telerentgenography of the skull in lateral projection.

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