Myographic Studies, before and after Treatment of TMJ Dysfunctions Complicated by Dental and Maxillofacial Anomalies

Safarova Mavludabonu Jamolovna
Bukhara State Medical Institute named after Abu Ali ibn Sino, Uzbekistan

Abstract: Studies of the biopotentials of the masticatory muscles are presented in this article. Each indicator of the electromyograph before and after treatment for musculoskeletal dysfunctions of the temporomandibular joint in the course of their studies, the authors recorded with their own hands. Electromyographic studies of the masticatory muscles before and after treatment affect the outcome of the received correct treatment and normalization of the activity of the masticatory apparatus and TMJ, as well as reveal the completeness of the picture of its functional state.

Keywords: dental and maxillary anomalies, temporomandibular joint, musculoskeletal dysfunction, masticatory muscles, electromyography.

Relevance. Currently, many authors have a number of etiopathogenetic theories of the origin of musculoskeletal dysfunction of the temporomandibular joint and terms that formulate this disease: myoarthropathy, myofascial pain syndrome, temporomandibular joint dysfunction syndrome, occlusive articulation disorders, musculoskeletal dysfunction (1, 2, 7, 9).

The most popular theories of the occurrence of musculoskeletal dysfunction of the temporomandibular joint (TMJ) are: "occlusive articulation", "muscular" and "psychogenic".

Many domestic and foreign researchers (5, 6, 8, 10) identify 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 20 individuals from the control group, 20 patients with musculoskeletal dysfunction of the TMJ complicated by dental and maxillary anomalies, before and after treatment. A total of 40 EMG were received.

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. To study the dynamics of changes in the neuromotor apparatus and the synchronicity of the masticatory muscles, the study was conducted before treatment and 3 months after treatment using centering splints or other temporary orthopedic structures. The obtained electromyograms were analyzed using the software for the electromyograph "Synapsis".

Results and discussions. Surface electromyography was used to determine the change in the functional state of the neuromuscular apparatus of the masticatory and temporal muscles proper at rest and with maximum jaw compression in the control and main group of patients before and after treatment. 20 people aged 18-25 years with intact dentitions, who do not have dental anomalies and TMJ diseases, made up the control group. In the main group, which is 20 people, we identified patients with TMJ dysfunction complicated by dental and maxillary anomalies.

Before the start of treatment and 3 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 total number of examined was 40 people. 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 average.

The temporal muscles in the main group also had high indices of maximum amplitudes of bioelectric activity (significance level $p < 0.01$) before treatment. In this group, there were patients with an amplitude reaching 660 MV, and in the control group this value did not exceed 62 MV. In these patients, the maximum amplitude of spontaneous bursts in the temporal muscle on the left before the start of treatment reached 598 mv. The maximum amplitude in the masticatory muscles was within 1271 mv.

At 3 months after the start of treatment in patients of the main group, the average values of the right temporal muscle were 35.1 ± 21.1 mv, left - 36.4 ± 18.9 mv, right chewing - 30.2 ± 17.1 mv, left chewing - 26.8 ± 16.6 mv. The maximum amplitude of bioelectric activity in the masticatory muscles in the main group after treatment reached 135 MV, in the temporal - 191 mv.

A decrease in spontaneous bursts indicates a decrease in the maximum amplitude of bioelectric activity at rest and, consequently, the restoration of the functional state of the temporal and masticatory muscles after complex treatment.

The index of symmetry of the temporal muscles (ISM) and the index of symmetry of the masticatory muscles (ISM), the maximum and average amplitudes of bioelectric activity of the masticatory and temporal muscles, we studied with the compression of the jaws in the usual occlusion.

The average values of the maximum amplitude of the right temporal muscle in the control group were 857.9 ± 361.2 mv, the left - 842.9 ± 500.6 mv, the right masticatory - 659.1 ± 458.7 mv, the left masticatory - 681.2 ± 717.4 mv. Before the start of treatment, the average values of the maximum amplitude in the corresponding muscles in the main group were 1301.2 ± 999.7 MV, 1451.1 ± 1250 mv, 1128.9 ± 983 mv, 1292.7 ± 965.3 mv. After treatment - 1044.6 ± 653.8 mv, 937.9 ± 691.9 mv, 1048 ± 773 mv, 1062.9 ± 736.8 MV, respectively. Already 3 months after the treatment of patients in the main group, the maximum amplitudes of bioelectric activity of the temporal and masticatory muscles decrease and approach the values of the control group ($p < 0.01$).

In the main group, the data obtained by the electromyograph indicate the restoration of

muscle contractile activity and the elimination of symptoms not only at the subjective level. Consequently, it has been statistically established that the 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 dental and maxillary anomalies, the average electrophysiological activity of the masticatory and temporal muscles during compression of the dentition before treatment was characterized by high amplitude indices: right temporal muscle 273.7 ± 198.6 mv, left - 255 ± 182.3 mv, right masticatory 289.4 ± 628 mv, left - 232.3 ± 148.9 mv. In the control group, these indicators in the corresponding muscles were as follows: 145.3 ± 100.3 MV, 148.9 ± 108 mv, 141.8 ± 212.2 MV, 148.3 ± 204.8 MV. After the complex treatment, the results in the control group and in the group of patients of the main group complicated by dental and maxillofacial.

Thus, in patients of the main group, after the treatment, the coordination and symmetry of the work of the masticatory and temporal muscles is restored when the dentition is compressed in the usual occlusion. In the control group, the average value of the ISVM was 94.1%, while this indicator ranged from 71 to 139%. Before treatment, the average value of this indicator in the main group was 120.5%, the minimum was 32%, and the maximum was 288%. In the range of the control group (71 - 139%), 7 people (23.3%) had the value of the ISVM, and 13 people (76.7%) went over this interval in a greater or lesser direction.

After 3 months, after treatment, the average value of ISVM in the main group became 95.1%, the minimum - 55%, the maximum - 155%. And already in 13 patients (70%) was in the range of the control group of the ISVM, and the value of the ISVM went beyond this interval in 9 (30%). In the control group, the mean value of the LCI was 95.5%, the minimum was 71%, and the maximum was 134%. Before treatment, the values in the main group were 32-207%, but 95.1% had an average value. The average value of the heart rate in patients of the main group complicated by dental and maxillofacial anomalies, after treatment, was 108.3%, the minimum - 59%, the maximum - 149%. And in 11 people (63.3%) this range was within the control group, but in 9 people (36.7%) it went beyond it.

Conclusions. Restoration of symmetry of bioelectric activity of masticatory and temporal muscles, and, consequently, normalization of their function is one of the positive effects of treatment of patients of the main group.

Analyzing the obtained electromyography data, it was found that the masticatory and temporal muscles are in a state of functional overload in patients of the main group. 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.

Complex treatment led to the regularization 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. And the restoration of the dynamic state of the muscles, synchronization and coherence in the process of their work in these patients leads to occlusion therapy. The regulation of the functional state of the masticatory muscles leads not only to the restoration of the masticatory apparatus and the disappearance of constant pain, but also to the correct inter-articular position of the head of the lower jaw.

LIST OF LITERATURE

1. Azimova Sh.Sh., Abruev U.R, Rasulov M.M. Prevalence of tooth-jaw anomalies among children of Bukhara urban school age. //Доктор Ахборотномаси. 2020. - №1. - С. 23-28 бет.

2. J.N. Bakaev. Continuous checking of the execution time of works arising from problems related to the anomaly of etiopathogenesis, modernity in Jondaszow.(Literary review)«Тиббиётда янги кун», 4 (32) 2020, С. 119- 123.
3. Gafforov S.A., Bakaev Zh.N. Features of the relationship of diseases of the oral mucosa with somatic pathology //Вестник ТМА. - Ташкент, 2019. - № 3. - С.20-24.
4. Gafforov S.A., Bakaev Zh.N. Agha Barilli shillik Bokhtar khasallikari - pathologist aspectlari and prevention // Stomatologiya. - Ташкент, 2019. - №4 (77). - С.75-80.
5. Olimov S.S. The importance of saliva metabolic parameters in the development of dental anomalies in children with metabolic syndrome.// “Стоматологик касалликларни даволашда ва профилактикасидаги долзарб муаммолар” Илмий амалий конференцияси. Бухоро. 2016.- 33бет.
6. Olimov S.S., Gafforov S.A. Bolalarda tish-Jag low-dollar and somatic kasalliklar horasida sadlikling asium bazari. (literary review).//Журнал. Stomatologiya. -2019й №1.60-65 бет.
7. Olimov S.G., Saidov A.A., Gaffarov S.A., Khodzhimetov A.A. Yeshdagi bolalard school hepatobiliary tizimning tish-zhagsamy defect pathogenetic value.// Журнал Доктор ахборотномаси. Самарканд. 2019 -№2. - 35-39 бет.
8. Olimov S.S. Evaluation of the effectiveness of preventive measures in the orthodontic treatment of children with dental deformities // Ўқув-услубий қўлланма. ЎзР ССВ томонидан 13.11.08 тасдиқланган. Ташкент. 2019. - 21 б.
9. Antunes Ortega AC, Pozza DH, Rocha Rodrigues LL, Guimarães AS. Relationship Between Orthodontics and Temporomandibular Disorders: A Prospective Study//J Oral Facial Pain Headache. 2016;30(2):134-138
10. Bakaev Zh.N.,Olimov S.Sh. New views on diagnostic methods for the formation of retention of the upper permanent canines (LITERATURE REVIEW) / International Journal on Integrated Education // Volume 3, Issue XII, December 2020, e-ISSN : 2620 3502, p-ISSN : 2615 3785, – P. 129-135.
11. J.N. Bakaev, S. Sh. Olimov. Modern approaches to diagnosis, etiology and pathogenesis of the upper permanent canine retention formation (literature Review) / European Journal of Molecular & Clinical Medicine // Volume 07, Issue 03, 2020. - P. 3815 -3830.
12. Bakaev Zh.N., Olimov S.Sh. Treatment and prevalence of abnormal eruption of permanent canines (Literature review) / Middle EuroDean Scientific Bulletin // VOLUME 7, December 2020, ISSN 2694-9970, – P. 16-19.
13. O. E. Idiev Maxillofacial Region in Children with Cerebral Palsy. / Middle European Scientific Bulletin //VOLUME 13 June 2021, P. 203-207.
14. Guljamol Fazliddinonvna Makhmudova, Adkhambek Uygunovich Nurboboyev.Treatment of mechanical jaundice via the modern way// Scientific progress, 2021.-№6.-P.530-537
15. Makhmudova G.F. Age-related clinical,anatomical and morphological features of malignant tumors of the cervix// Journal of science and technology//2021.-P.-475-480
16. O. E. Idiev Cerebral Palsy and Dental Anomalies. / Central Asian Journal Of Medical And Natural Sciences // Volume: 02 Issue: 03 | May-June 2021, P. 350-355.

17. O. E. Idiev Evaluation of Electromyographic studies of masticatory muscles in Children with Cerebral Palsy. / International Journal On Human Computing Studies//Volume: 03 Issue: 2 March-April 2021, P. 46-48.
18. N. N. Khabibova, L.A. Saidova State of the dentoalveolar system in children from mothers with gestational hypertension / Middle European Scientific Bulletin // VOLUME 7, December 2020 ISSN 2694-9970, p.101-104
19. AH Narzulloyevich, MG Fazliddinovna, KF Sharopovna// Comparison of the results of modern methods of treatment of elderly women with breast cancer// Eurasian Medical Research Periodical 3, 9-15.
20. Махмудова Г. Ф., Темирова, Д. В., &Баротова, Ш. Б. (2021). Бачадон бўйни хавфли ўсмаларининг ёшга хосхусусиятлари//Academicresearcheducationalsciences // 2(5).-Б.-186-196. https://doi.org/10.24411/2181-1385-202100871
21. Maxmudova G.F.,Soxibova Z.R., Mamedov U.S., Nurboboyev A.U. Fertil va keksa yoshli ayollarda bachadon bo'yni xavfli o'smalari tahlili (Buxoro viloyatida)//Oriental Renaissance: Innovative, educational, natural and social sciences//-2021.-V 8.-B. 175-184.
22. S. A. Gafforov, G. E. Idiev The importance of neurological and psychological methods in the diagnosis of disorders of the activity of the jaw-lower jaw /Euro Science: International Conference on Social and Humanitarian Research // April 25 rd -26 th 2021- P. 130-134
23. Nurboboyev A.U., Makhmudova G.F. Miniinvazive approach in the complex treatment of tumor and stone etiology of mechanical jaundice// International journal on Orange technology// Vol 3. Issue 9. Sep.2021.-P. 85-90
24. М.А. Ахмадова, А.Т.,Сохибова З.Р., Д.К. Худойбердиев.,Ж.Р.Нуров Диагностика эхинококкоза у молодёжи на современном этапе./Тиббиётда янги кун 2019 й.3(27)-стр 54-56
25. М.А. Ахмадова, А.Т. Чўлиев, Ж.Р. Нуров, Д.К. ХудойбердиевЛучеваядиагностикаэхинококкозапечени./Биологияватиббиётмуаммолари.2019,№4.2(115)с.20-25
26. Сохибова З.Р.,Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени./OrientalRenaissance:Innovative,Educational, naturalandsocialsciences/2021й -стр 203-212.
27. MG Fazliddinovna, NA Uygunovich, ND Faxriddinovna The modern way of diagnosis of cervical pathology in women with uterine fibroids via the colposcopy//Web of scientist: international scientific research journal.-3(02), 1017-1027, 2022.
28. G.F.Makhmudova Colposcopic analysis of cervical pathology in women with uterine fibroids//Scientific progress// 3(1), 289-296,2022
29. А.У. Нурбобоев, МС Шаропова, А.Ф. Махмудова Турли этиологияли механик сарикликни даволашда замонапвий минилапаратом усуллар// Scientific progress// 3(1), 713-721, 2022