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IMPROVEMENT OF DIAGNOSIS AND TREATMENT OF TEMPOROMANDIBULAR JOINT PAIN DYSFUNCTION SYNDROME

5A510401- « Dentistry»

Thesis for the academic degree of Master

Supervisor:

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INTRODUCTION

Relevance of the topic. Pain dysfunction syndrome is the most common disorder among temporomandibular joint pathologies, and the number of patients has continued to increase in recent years despite the large number of studies devoted to this problem, the etiology and pathogenesis of the disease are still interpreted ambiguously. Most researchers, adhering to any one of the etiological concepts, ignore or downplay the role of others. For example, for a long time, the occurrence of pain dysfunction syndrome has been associated with bite anomalies and deformities, dentition integrity disorders, and changes in occlusal height. At the same time, patients with pronounced dentoalveolar anomalies without temporomandibular joint disorders, as well as patients with pain dysfunction syndrome without occlusal-articular pathology are often encountered in clinical practice. In recent years, more and more researchers are inclined to believe that the leading role of changes in the psychoemotional status in the development of pain dysfunction syndrome. Meanwhile, it is known that psychoemotional disorders can

both provoke the disease and be a consequence of long-term pain symptoms and contribute to chronic pain. Some authors consider masticatory muscle parafunctions as the cause of this disease. Nevertheless, it is known that such pathological conditions may be a consequence of both occlusive-articular disorders and changes in the psychoemotional status of patients. In the context of the current ambiguous approach to understanding the etiology and pathogenesis of the disease, the diagnosis of pain dysfunction syndrome presents significant difficulties. With a large variety of examination methods applied, no clear criteria for diagnosis have been developed. The electroneuromyographic method of examination is of particular importance in the diagnosis of pain dysfunction syndrome because, according to many authors, masticatory muscle dysfunction plays a key role in the development of this disease. However, there is no unified algorithm for the electroneuromyographic study of neuromuscular changes in patients with pain dysfunction syndrome. Probably for this reason, the data presented in the literature by different authors are often ambiguous and even contradictory. Treatment of patients with pain dysfunction syndrome also remains one of the most complex and urgent problems of modern dentistry. Most of the proposed therapies are symptomatic, recommendatory in nature and are not effective enough. This situation leads to the fact that the arsenal of medications and other methods of treatment of patients with this disease is constantly increasing, creating difficulties in the choice of tactics for the practitioner. Therefore, the development of simple but effective ways to improve the effectiveness of treatment of patients with pain dysfunction syndrome, taking into account the causal mechanisms of disease development and using a comprehensive individual approach, based on the results of the examination, is a reasonable and necessary measure in modern conditions.

Thus, the development of simple but effective ways to improve the effectiveness of treatment of patients with pain dysfunction syndrome, taking into account the cause-and-effect mechanisms of disease development and using a comprehensive individual approach, based on the results of the examination, is a reasonable and necessary measure in modern conditions.

Purpose of the study: To improve methods of diagnosis and treatment of patients with temporomandibular joint pain dysfunction syndrome

Objectives of the study: - To study features of the psychoemotional status of patients with temporomandibular joint pain dysfunction syndrome;

- To analyze electroneuromyographic parameters of the state of the maxillofacial neuromuscular apparatus in patients with temporomandibular joint pain dysfunction syndrome;

- To develop an algorithm of therapeutic measures for patients with temporomandibular joint pain dysfunction syndrome, taking into account the cause-and-effect mechanisms of the disease development

Materials and methods of the study. The examination of 60 patients was carried out in Samarkand State Medical University for the period 2021-2023. The general state and anamnesis were studied. Patients were carried out dental, clinical, laboratory and instrumental examination using standard methods.

SCIENTIFIC NOVELTY

- For the first time, it was determined that in patients with temporomandibular joint pain dysfunction syndrome, the structural restructuring of the motor units of the masticatory muscles proper, corresponding to stage II, SHA of denervation and reinnervation process according to B.M. Gecht, is observed;

- For the first time, changes in the psychoemotional status of patients and, above all, an increase in the level of personal anxiety influenced the severity of the temporomandibular joint pain dysfunction syndrome;

- For the first time, we determined the important role of suprasegmental structures of the central nervous system in the formation of pain symptoms in temporomandibular joint pain dysfunction syndrome.

PRACTICAL RELEVANCE

The results of the study can be used by dentists, general practitioners, and can also be included in the course of lectures for medical students. The use of the developed program of electroneuromyographic examination of patients with temporomandibular joint pain dysfunction syndrome provides high specificity of

diagnosis, timely and rational carrying out of a complex of therapeutic measures. The use of central myorelaxants in complex therapy for pain dysfunction syndrome in patients with persistent spontaneous activity of the motor units of the masticatory muscles proper allows to achieve more rapid relief of pain symptoms. Use of electrostimulation and magnetic therapy by a running magnetic field in accordance with the established clinical and electromyographic criteria in the temporomandibular joint pain dysfunction syndrome promotes restoration of bioelectrical activity of muscles and pain symptom relief. Implementation of a pathogenetically substantiated algorithm for the complex treatment of patients with temporomandibular joint pain dysfunction syndrome developed on the basis of the results of clinical, radiological, electroneuromyographic and psychological examination of patients allows us to reduce the treatment period and increase its effectiveness.

DISSERTATION APPROBATION

The dissertation was approved at the meeting of the department of maxillofacial surgery. Samarkand State Medical University PUBLICATIONS. 8 scientific works, including 5 journal articles, 3 thesis, including 3 abroad were published on the materials of the dissertation.

ОБЪЕМ И СТРУКТУРА РАБОТЫ. Диссертация изложена на 84 страницах компьютерного текста, состоит из введения, обзора литературы, главы материалов и методов исследования, главы результатов собственного исследования, заключения, выводов и практических рекомендаций. Работа иллюстрирована 7 таблицами, 22 рисунками, 1 диаграммами. Библиографический указатель включает 100 источников, в том числе 20 иностранных авторов.

CHAPTER 1. CURRENT VIEWS ON ETIOLOGY, PATHOGENESIS, DIAGNOSIS AND TREATMENT OF TEMPOROMANDIBULAR JOINT PAIN DYSFUNCTION SYNDROME (LITERATURE REVIEW)

1.1 Etiological factors in the development of temporomandibular joint pain dysfunction syndrome

A large number of studies in the Russian and foreign literature are devoted to the etiology and pathogenesis of temporomandibular joint pain dysfunction syndrome (BH^IC). However, there is still no consensus on the nature of this disease [1,13]. Scientific studies indicate various factors that may, according to scientists, lead to the development of joint disease. According to some authors were trauma (29.42%), wide mouth opening (15.6%), eating hard food (9.65%), prosthetic errors (8.52%), tooth extraction (6.91%), lowered occlusal height (5.63%), colds (5.47%). Another group of scientists believes that inflammatory processes during the eruption of wisdom teeth, exacerbation of chronic periodontitis of the upper molars, changes

in the position of muscle attachment due to displacement of fragments of damaged bones, prolonged stay of the patient with an open mouth during dental treatment, irrational prosthetics, presence of terminal unilateral defects, stress conditions or chronic psycho-emotional disorders may be the causes of the development of TMJ pain dysfunction syndrome. According to a group of scientists, an emotional factor (51.43%) plays a major role in the development of pain dysfunction.

In addition, in their opinion, jaw-facial trauma (3.81%), deformities of occlusal surfaces of dental rows, reduction of interalveolar distance (14.29%), habitual unilateral chewing (4.76%) can contribute to the development of the disease. It is known that this disease is predominantly (from 70% to 82%) observed in women of working age. The study of TMJ pain dysfunction syndrome showed that statistically significant differences of clinical manifestations of the disease in men and women were observed at the age of 30-50 years. According to Yu.M. Pisarevsky et al. (2003), changes in the state of the reproductive system in women may influence the development of pain dysfunction syndrome. In recent years, the role of hereditary predisposition to functional disorders of the TMJ has been established. Some authors regard joint pathology as a local manifestation of connective tissue lesions. Thus, many researchers argue that the degree of connective tissue dysplasia severity largely determines the course of TMJ dysfunction and its possible complications. It follows from the above that the factors described in the literature as influencing the development of pain dysfunction syndrome are rather heterogeneous in nature. Therefore, S. Baskan and A. Zengingul (2006) proposed to divide them into three main groups. The first group is predisposing factors. In turn, they are divided into: systemic (concomitant diseases), psychological (psycho-emotional state) and structural (occlusal disorders, structural changes of the TMJ). To the second group of factors, which they called ≪ triggering or initializing ≫, the authors refer to trauma to the TMJ, its overloading, and parafunctions of the masticatory muscles. And the third group is the supporting factors. These include social and economic problems. And the supporting factors often play a more important role than the factors that initiate the disease.

Thus, most of the works devoted to the syndrome of painful TMJ dysfunction consider the disease to be polyetiological. The etiological factors identified by the authors are so heterogeneous in nature and diverse that they are difficult to analyze in detail and do not allow us to formulate a single generally accepted theory of the pathogenesis of the disease. Apparently, for this reason, there is a tendency in the modern literature to consider one group of factors as the leading one. In this regard, there are several concepts of the development of TMJ pain dysfunction syndrome: occlusal-articular, psychophysiological, associated with masticatory muscle parafunctions and combined.

1.2 Principles of Treatment of Patients with TMJ Pain Dysfunction Syndrome

The treatment of patients with TMJ pain dysfunction syndrome is one of the most challenging tasks of modern dentistry. In recent years, views on the essence of the manifestations of this disease have gradually changed, and a variety of treatment methods have been proposed and rejected, which creates difficulties in the choice of tactics for the practitioner. It should be emphasized that there is no single, sufficiently effective method of therapy for patients with TMJ pain dysfunction. Most often, the treatment described in the literature is complex and includes the use of medication therapy, orthopedic methods, physical therapy, and myogymnastics. Various nonsteroidal anti-inflammatory drugs are used for pain relief (including local application), such as acetylsalicylic acid, indomethacin, voltaren, ibuprofen, piroxicam, and movalis. Such therapy is recommended for 7-10 days. At the same time, in our opinion, the use of these agents is not quite justified, because pain in pain dysfunction syndrome has a non-inflammatory nature. According to most researchers, it is associated with masticatory muscle hypertonicity. Another group of drugs used to treat patients are tranquilizers (phenazepam, tetrazepam), which relieve anxiety, fear, reduce emotional tension, and, in addition, have a muscle relaxing effect. In recent years, there have appeared works devoted to the use of antidepressants in the treatment of patients with TMJ pain dysfunction syndrome. For example, based on our own research, we claim that serotonin-based thymoanaleptics (fluoxetine; fevarin; paxil), which have their own powerful

analgesic effect, can significantly increase the effectiveness of antidepressants for this disease. These findings are supported by studies conducted. In the national literature devoted to the treatment of TMJ pain dysfunction syndrome, there are data on the use of central-type muscle relaxants (baclofen, mydocalm, sirdalud) to reduce muscle tension and relieve the associated pain reaction. Mydocalm is a central myorelaxant with a local analgesic component. In recent years, the drug has proven to be highly effective and safe in the treatment of neurological syndromes associated with pain, impaired trophism and increased muscle tone. It has also been successfully used in the treatment of myofascial pain by attenuating muscle tone without causing sedation. Nevertheless, the clinical aspects of the use of central muscle relaxants have not been sufficiently studied in these studies. The indications and contraindications for their prescription are not determined, and there are no data on their effect on muscle tone in patients with VEIS pain dysfunction syndrome. Literature sources on this issue are only advisory, although many researchers recognize the important role of masticatory muscle hypertonicity in the development of the pain response. Another method of pain management is the direct injection of local anesthetics into the trigger points. However, according to observations, this technique can give a negative result in some cases. In their opinion, pain in pain dysfunction syndrome is a manifestation of polysynaptic pathology, on which local exposure to local anesthetics can have no significant effect. A great deal of attention in the literature is paid to a variety of orthopedic treatments for patients with TMJ pain dysfunction syndrome. Selective tooth grinding is the gentlest and most effective method for normalizing occlusal-articular relations in painful TMJ dysfunction syndrome. The authors proved by means of functional methods of research that after selective grinding there was a decrease in the indices of peripheral resistance tone of the TMJ and periodontal vessels on the side of occlusal trauma. According to the electromyographic study, there was an increase in the bioelectrical activity of the masticatory and temporal muscles, but the asymmetry of contractility observed on the initial electromyograms persisted for six months. An important place in the orthopedic treatment of TMJ dysfunction is occupied by the use of

various types of occlusal splints. A distinction is made between release, repositioning, relaxing and stabilizing occlusal splints. The following types of splints are distinguished:

- splints reduce__muscular activity, helping to relieve masticatory muscle spasm; splints eliminate premature contacts on the teeth and thereby prevent pathological afferent impulses from the periodontium;

- increased interocclusal height on splints alters intra-articular relationships;

- splints destroy pathological neuromuscular reflexes, causing a change in mandibular position;

- the splint has a placebo effect.

However, there are still contradictions in the definition of the indications for the use of splints, as well as in the duration of treatment, the degree of tooth overlap, the thickness, the choice of jaw for fixation and the frequency of corrections.

Disentangling splints are used when the occlusal height is reduced. Repositioning splints are used for repositioning the lower jaw, centering the articular heads in the fossa. The main purpose of repositioning treatment is the advancement of the lower jaw to create a normal relationship between the articular head and the TMJ disc. Relaxation splints, unlike release and reposition splints, provide symptomatic treatment and are indicated in cases where the pain syndrome does not identify the causative factors or the occlusal disturbances cannot be eliminated. These splints relax the muscles that elevate the lower jaw and activate their antagonists. The stabilizing splints ensure a stable position of the lower jaw in the central occlusion. These splints are used in the treatment of bruxism, painful masses in the masticatory muscles and dislocation of the articular disc. It has been proven that the use of soft occlusal splints (myofunctional trainer) for the treatment of functional disorders of the TMJ in adult patients is not effective. Therefore, he suggests the use of rigid occlusal splints. The duration of such therapy may be 1.5-2 years. This data is also confirmed by emphasizing that the width of the articulating splint in the vertical direction should not be increased by more than 2 times. Therefore, the thickness of the occlusal splint should not exceed 3 mm. L.A. Skorikova (2000) states that the

occlusal height separation should not be less than 3-4 mm, which exceeds the limits of relative physiological rest causing ≪inhibitory inhibition≫. In addition, the author points out the importance of the presence of dentofemoral impressions on the splint. Since, the smooth occlusal surface promotes sliding of the teeth, the mandible is displaced due to its mobility, aggravating the pathology. These data were also confirmed For the treatment of patients with TMJ pain dysfunction syndrome, various physical methods are used. When the pain syndrome is pronounced, the most effective, in our opinion, is the prescription of microwave therapy in the area of the joint in combination with fluctuorization of the masticatory muscles. Centimeter and decimeter microwaves have a pronounced anti-inflammatory effect, and pulsed current (fluctuorization) changes muscle tone and has an analgesic effect. The authors also note that UHF therapy stimulates the development of connective tissue, so it is not recommended when treating patients with functional disorders and secondary structural changes of the TMJ. Ultrasound therapy was used to accelerate the restoration of cartilage tissue of articular surfaces. Biochemical and morphological changes in the cartilage and bone tissue, according to their study, began on the 5th day and continued for 60 days. L.G. Turbina and N.V. Grishina (2001) used helium-neon laser according to their own technique to relieve the pain syndrome in VECS dysfunction. The authors alternately irradiated several zones: 1) through the light guide the retromolar space from both sides - projection zone of the trigger points of the wing muscles; 2) trigger points in 3-4 in the masticatory muscles; 3) exit points of the trigeminal nerve branches. Time of action for each point was 2 min at the power flux density of 10 mW/cm, total time - 10-12 min, the course - 10 procedures. The studies of foreign authors on the use of percutaneous electroneurostimulation (PNS) in the treatment of patients with TMJ pain dysfunction are of interest, others claim that this method has a number of positive effects. The physiological effect is due to the fact that pulsed electrical currents, causing motor excitation and contraction, simultaneously reflexively increase blood and lymph circulation, as well as the entire complex of metabolic and trophic processes aimed at energy supply of the working muscles. During

electrostimulation, thanks to the segmentary-reflex relationship, not only the activity of directly stimulated nerves and muscles is intensified, but also metabolic processes in symmetric muscles are accelerated. Besides, pulsed electrical currents have antiparabiotic effect on nerve fibers (Nikolaeva N.B. et al., 2007). The effect of CHENS on a-P neurons allows to stop pain syndrome. Prolonged electrical nerve stimulation can also cause release of endogenous lipids and beta-lipoproteins. The psychological effect of 43FIC is associated with a certain placebo effect, which is most pronounced in patients with emotional disorders (Stankovic S, Krunic P., 2007). In addition, the authors found that the simultaneous use of the occlusion splint and CHENS allows to relieve pain and other clinical symptoms in 86% of patients. Many authors also recommend the use of myogymnastics in the treatment of patients with TMJ pain dysfunction syndrome. According to them, this method has a number of advantages: it is easy to perform, the positive effect when using it develops quite quickly, has no complications, does not require additional equipment and can be easily performed by the patient himself. Exercises are used to normalize the movements of the lower jaw, to restore synchronous work in both articulations, coordination of masticatory muscles, consolidation of the results of orthopedic bite realignment. However, the complexes of myogymnastic exercises for the treatment of patients with TMJ pain dysfunction syndrome are extremely rare in the literature. In the Russian literature, there are single studies on the use of the method of postisometric and postreciprocnostic relaxation of the maxillofacial muscles, which have a powerful therapeutic effect. The essence of the method of postisometric relaxation consists in combination of short-term isometric work (5-7 s) and passive muscle stretching in the next 6-10 s. Such combinations are repeated 4-6 times, resulting in stable hypotonia in the muscle and disappearance of initial soreness. The technique of post-response relaxation is postisometric relaxation of a muscle with subsequent activation of its antagonist. The relaxation effect in this case is based on the mechanism of reciprocal inhibition caused by the interaction of afferent flows arising in the neuromuscular spindles of antagonist muscles. Thus, analysis of the domestic and foreign literature suggests that treatment of patients with TMJ pain

syndrome is a complex task whose solution is impossible without a clear understanding of the mechanisms of disease development. Most of the proposed methods of treatment are aimed at eliminating a single factor and are not devoid of empiricism. The development of a comprehensive pathogenetic therapy algorithm will undoubtedly improve the results of treatment of patients with TMJD syndrome. In conclusion, it should be noted that despite numerous studies devoted to TMJ pain dysfunction syndrome, this problem remains topical in modern dentistry and requires further observation. The issues of etiology and pathogenesis of the disease have not been sufficiently studied, and the available concepts cannot fully explain the development of this pathology. In these circumstances, the diagnosis of the disease also presents difficulties. With a large variety of examination methods used, no clear criteria for the interpretation of the results have been developed. The treatment of patients is often symptomatic, advisory in nature. In turn, the absence of diagnostic algorithms and pathogenetic treatment schemes makes it difficult for practitioners to cope with the increasing number of patients with TMJ pain dysfunction syndrome.

1.3 Principles of Treatment of Patients with TMJ Pain Dysfunction Syndrome

The treatment of patients with TMJ pain dysfunction syndrome is one of the most challenging tasks of modern dentistry. In recent years, views on the essence of the manifestations of this disease have gradually changed, and a variety of treatment methods have been proposed and rejected, which creates difficulties in the choice of tactics for the practitioner. It should be emphasized that there is no single, sufficiently effective method of therapy for patients with TMJ pain dysfunction. Most often, the treatment described in the literature is complex and includes the use of medication therapy, orthopedic methods, physical therapy, and myogymnastics. Various nonsteroidal anti-inflammatory drugs are used for pain relief (including local application), such as acetylsalicylic acid, indomethacin, voltaren, ibuprofen, piroxicam, and movalis. Such therapy is recommended for 7-10 days. At the same time, in the opinion of Y. V. Grachev and V. I. Shmyrev (2007), the use of these agents is not quite justified, as pain in pain dysfunction syndrome is not of

inflammatory nature. According to most researchers, it is associated with masticatory muscle hypertonicity. Another group of drugs used to treat patients are tranquilizers (phenazepam, tetrazepam), which relieve anxiety, fear, reduce emotional tension, and, in addition, have a muscle relaxing effect. In recent years, there have appeared works devoted to the use of antidepressants in the treatment of patients with TMJ pain dysfunction syndrome. For example, E.A. Gorozhankina (2005) states on the basis of her own research that the use of antidepressants can significantly increase the clinical efficacy of the therapy. The serotonin thymoanaleptics (fluoxetine; Phevarine; Paxil), which have their own powerful analgesic effect, are the most effective for this disease. In the national literature devoted to the treatment of TMJ pain dysfunction syndrome, there are data on the use of central muscle relaxants (baclofen, mydocalm, sirdalud) to reduce muscle tension and relieve the associated pain reaction. Midocalm is a central myorelaxant with a local analgesic component. In recent years, the drug has proven to be highly effective and safe in the treatment of neurological syndromes associated with pain, impaired trophism, and increased muscle tone. In addition, it is successfully used in the treatment of myofascial pain, weakening muscle tone without causing sedation. Nevertheless, the clinical aspects of the use of central muscle relaxants have been insufficiently studied in these studies. The indications and contraindications for their prescription are not defined, there are no data on their influence on muscle tone in patients with VEIS pain dysfunction syndrome. Literature sources on this issue are only advisory, although many researchers recognize the important role of masticatory muscle hypertonicity in the development of the pain response. Another method of pain relief is the direct injection of local anesthetics into the trigger points. However, according to the observations of Yu.

and V.I. Shmyrev (2007), this method can give a negative result in a number of cases. In their opinion, pain in pain dysfunction syndrome is a manifestation of polysynaptic pathology, on which the local effect of local anesthetics can not have a significant impact. A great deal of attention in the literature is paid to a variety of

orthopedic treatments for patients with TMJ pain dysfunction syndrome. Selective grinding of the teeth is

The most sparing and effective method of normalizing occlusal-articular relations in TMJ painful dysfunction syndrome (E.S. Kalivrajian et al., 2003; N.N. Abolmasov, 2004; R. Kerstein. B., 1995). Y.B. Zolotareva and I.E. Guseva (2004) confirmed the effectiveness of this technique in patients. Using functional methods of research, the authors proved that after selective grinding there was a decrease in the indices of peripheral resistance tone of the TMJ and periodontal vessels on the side of occlusal trauma. According to the electromyographic study, there was an increase in the bioelectrical activity of the masticatory and temporal muscles, but the asymmetry of contractility observed on the initial electromyograms persisted for six months. An important place in the orthopedic treatment of TMJ dysfunction is occupied by the use of various types of occlusal splints. A distinction is made between release, repositioning, relaxing and stabilizing occlusal splints. The following types of splints are distinguished,

- Splints decrease muscular activity by relieving masticatory muscle spasm;
- splints eliminate premature contacts on the teeth and thus prevent pathological afferent impulses from the periodontium;
- increased interocclusal height on splints alters intra-articular relationships;
- splints destroy pathological neuromuscular reflexes, causing a change in mandibular position;
- the splint has a placebo effect.

However, there are still contradictions in the definition of the indications for the use of splints, as well as in the duration of treatment, the degree of tooth overlap, the thickness, the choice of jaw for fixation, and the frequency of corrections. Splinting splints are used when the occlusal height is reduced.

Repositioning - performs mandibular repositioning, alignment of the articular heads in the fossae. The essence of repositioning therapy is to move the lower jaw forward until the normal relationship between the articular head and the TMJ disc is created. Relaxation splints, unlike release and reposition splints, provide

symptomatic treatment and are indicated in cases where the pain syndrome does not identify the causative factors or the occlusal disturbances cannot be eliminated. These splints relax the muscles that elevate the mandible and activate their antagonists (Khvatova V.A., 2001). Stabilizing splints provide a stable position of the mandible in central occlusion. These splints are used in the treatment of bruxism, in the presence of painful seals in the masticatory muscles, in the case of articular disc displacement. V.V. Badanin (2003) proved that the use of soft occlusal splints (myofunctional trainers) for the treatment of functional disorders of the TMJ in adult patients is ineffective. Therefore, he suggests the use of rigid occlusal splints. The duration of such therapy may be 1.5-2 years. These data are also supported by D. Littner et al. (2004). In addition, V.V. Badanin (2003) emphasizes that the width of the articular splint in the vertical direction is inadmissible to increase by more than 2 times. Therefore, the thickness of the occlusal splint should not exceed 3 mm. L.A. Skorikova (2000) states that the occlusal height separation should not be less than 3-4 mm, which exceeds the limits of relative physiological rest, causing ≪inhibitory inhibition≫. In addition, the author points out the importance of having impressions of the antagonist teeth on the splint. Since the smooth occlusal surface promotes tooth sliding, the mandible shifts due to its mobility, exacerbating the pathology. These findings were also confirmed by R.S. Conti et al. (2016). Various physical methods are used to treat patients with TMJ pain dysfunction syndrome. In severe pain syndrome, the most effective, according to O.I. Efanov and A.G. Volkov (2004), is the prescription of microwave therapy in the area of the joint in combination with fluctuorization of the masticatory muscles. Centimeter and decimeter microwaves have a pronounced anti-inflammatory effect, and pulsed current (fluctuorization) changes muscle tone and has an analgesic effect. The authors also note that UHF therapy stimulates the development of connective tissue, so it is not recommended when treating patients with functional disorders and secondary structural changes of the TMJ. In order to accelerate the restoration of cartilage tissue of articular surfaces, V.V. Bogatov, E.N. Sergienko (2004) used ultrasound therapy. Biochemical and morphological changes in the cartilage and

bone tissue, according to their study, began on the 5th day and continued for 60 days. L.G. Turbina and N.V. Grishina (2001) used helium-neon laser according to their own methods to relieve pain syndrome in TMJ dysfunction. The authors irradiated several zones in turn:

1) through the light guide the retromolar space on both sides - the zone of projection of the trigger points of the wing muscles;

2) trigger points in the number of 3-4 in masticatory muscles;

3) exit points of trigeminal nerve branches. Time of action for each point was 2 min at the power flux density of 10 mW/cm, total time - 10-12 min, the course - 10 procedures. Studies of foreign authors on the use of percutaneous electroneurostimulation (PENS) in the treatment of patients with TMJ pain dysfunction are of interest. N. Krunich (2017) states that this method has a number of positive effects. The physiological effect is related to the fact that pulsed electric currents, causing motor excitation and contraction, simultaneously reflexively increase blood and lymph circulation, as well as the entire complex of metabolic and trophic processes aimed at energy supply of working muscles. Thanks to segmentary-reflex interconnections during electrostimulation, not only the activity of directly stimulated nerves and muscles is intensified, but also metabolic processes in symmetrical muscles are accelerated, pulsed electrical currents have antiparabiotic effect on nerve fibers. The effect of TMJ on the neurons allows to stop the pain syndrome. Prolonged electrical nerve stimulation can also induce the release of endogenous opioids and beta-lipoproteins. The psychological effect of TMJ is associated with a certain placebo effect, which is most pronounced in patients with emotional disorders. In addition, the authors found that the simultaneous use of the occlusion splint and the TMJD allows pain and other clinical symptoms to be relieved in 86% of patients. When treating patients with TMJ pain dysfunction syndrome many authors also recommend using myogymnastics (E.S. Kalivrajian et al., 2003, A.V. Silin, 2007; Grace E.G. et al., 2002; Cleland J., Palmer J. 2004; Michelotti A. et al., 2004). In their opinion, this method has a number of advantages: it is easy to perform, the positive effect when using it develops rather quickly, has

no complications, does not require the use of additional equipment and can be easily performed by the patient himself. Exercises are used to normalize the movements of the lower jaw, to restore synchronized work in both articulations, coordination of masticatory muscles, consolidation of the results of orthopedic bite realignment. However, the complexes of myogymnastic exercises for the treatment of patients with TMJ painful dysfunction syndrome are extremely rare in the literature. In the Russian literature there are single studies on the use of the method of postisometric and postreciprocnostic relaxation of the maxillofacial muscles, which have a powerful therapeutic effect. The method of postisometric relaxation consists in combination of short-term isometric work (5-7 seconds) and passive muscle stretching in the next 6-10 seconds. Such combinations are repeated 4-6 times, resulting in stable hypotonia in the muscle and disappearance of initial soreness. The technique of post-response relaxation is postisometric relaxation of a muscle with subsequent activation of its antagonist. The relaxation effect in this case is based on the mechanism of reciprocal inhibition due to the interaction of afferent flows arising in the neuromuscular spindles of antagonist muscles. Thus, the analysis of the domestic and foreign literature suggests that the treatment of patients with TMJ pain dysfunction syndrome is a complex task whose solution is impossible without a clear understanding of the mechanisms of disease development. Most of the proposed treatment methods are aimed at eliminating a single factor and are not devoid of empiricism. The development of a comprehensive pathogenetic therapy algorithm will undoubtedly improve the results of treatment of patients with TMJ pain dysfunction syndrome. In conclusion, it should be noted that despite numerous studies devoted to TMJ pain dysfunction syndrome, this problem remains topical in modern dentistry and requires further observation. The issues of etiology and pathogenesis of the disease have not been sufficiently studied, and the available concepts cannot fully explain the development of this pathology. In these circumstances, the diagnosis of the disease also presents difficulties. With a large variety of examination methods used, no clear criteria for the interpretation of the results have been developed.

The treatment of patients is often symptomatic, advisory in nature. In turn, the absence of diagnostic algorithms and pathogenetic treatment schemes makes it difficult for practitioners to cope with the increasing number of patients with TMJ pain dysfunction syndrome.

CHAPTER II. RESEARCH MATERIALS AND METHODS

2.1 General characteristics of clinical observations

We studied 60 patients with temporomandibular joint pain dysfunction syndrome (TMJ) who were treated as outpatients or inpatients at the surgical department of Samarkand regional clinical dental polyclinic and at the department of maxillofacial surgery of the hospital during the period from 2021 to 2023. Women comprised 50 (83.3%) and men comprised 10 (16.7%) of those observed. The age of the patients ranged from 20 to 56 years (Table 1). In addition, 30 individuals with no pathology participated in the study. VEIS, whose age and sex corresponded to that of the patients. As can be seen from the above data, the majority of patients, 47 persons (78.3%), were of the most active and employable age, and women suffered from the disease 5 times more often than men. Depending on the treatment we divided all the patients into two groups: 1 - the main group and 2 - the comparison group. The patients were randomly recruited. The comparison group consisted of 30 patients whose treatment was based on the data obtained during clinical and

radiological examination. The main group consisted of 30 patients whose complex treatment was carried out in accordance with the results of clinical, radiological, psychological and electroneuromyographic examination. The average age of the patients in the groups was practically the same. It was 35.9+2.4 years in the comparison group and 32.3+2.4 years in the main group (p>0.05). The ratio of men and women also did not differ statistically significantly from each other (p>0.05). Concomitant somatic diseases were identified in 17 people (28.3%) out of the total number of those examined. As a rule, these individuals belonged to the mature age group. Pathology of the digestive organs and musculoskeletal system, in particular osteochondrosis of the cervical spine, prevailed in the structure of morbidity. Patients with severe comorbidities in the acute or decompensation stage were not included in the study (Table 2).

Table 2

Pathology of the digestive organs and musculoskeletal system with severe concomitant pathology in the acute stage

Distribution of concomitant pathology by system	Number of patients in groups		
	Main group	Group Comparison group	Total abs. / %
1. Diseases of the digestive organs	**3**	**3**	6/ 10,0
2. Diseases of the musculoskeletal system	**4**	**3**	7/11,7
3. Diseases of the cardiovascular system	**2**	**1**	3/5,0
4. endocrine diseases	**-**	**1**	1/1,6

Total	**9**	**8**	17/28,3

All patients were examined clinically and radiologically. In addition, psychoemotional status and the state of the neuromuscular apparatus of the dentoalveolar system were studied in the patients of the main group. The effectiveness of the conducted therapeutic measures was evaluated by repeated examinations performed after 2 weeks, a month, 6 months and a year from the start of treatment. In addition, electroneuromyographic and neuropsychological examinations were repeated in 3 months for the patients of the main group. All patients were examined clinically and radiologically to solve their problems. In addition, psychoemotional status and the state of the neuromuscular apparatus of the dentoalveolar system were studied in the patients of the main group. The effectiveness of the conducted therapeutic measures was evaluated by repeated examinations performed after 2 weeks, a month, 6 months, and a year from the start of treatment. In addition, electroneuromyographic and neuropsychological examinations were repeated in 3 months for the patients of the main group

2.2 Clinical examination of patients with temporomandibular joint pain dysfunction syndrome

Clinical examination of patients included interview, examination, palpation of the TMJ and masticatory muscles, assessment of the amplitude of lower jaw movements (opening and closing of the mouth, lateral displacement of the lower jaw, its advancement). The results of the examination were recorded in a questionnaire specially designed for this purpose (see Appendix). Patients were interviewed purposefully, elucidating in detail the most important circumstances, which in one way or another could have contributed to the development of the disease. The main reason for patients to seek medical care was pain in the projection of the TMJ and masticatory muscles. Its localization, character, intensity and irradiation were specified. If patients complained of clicking in the TMJ, we asked about the timing of their occurrence, their relation to the development of the pain symptom, and whether they were of a permanent or temporary nature. If patients

complained about restriction in mouth opening, we determined what caused it: mechanical obstruction in the TMJ, pain or a combination of these factors. While collecting the anamnesis, we noted the duration of the disease and the reasons which, in the patient's opinion, could have caused it. We found out whether any treatment had been performed, its effectiveness. We paid attention to the patients' bad habits and masticatory muscle parafunctions. Particular attention was paid to past and concomitant diseases, and the emotional state of the patients was taken into account. Examination of the maxillofacial area started with external examination. Facial symmetry was assessed. Palpation of the TMJ was conducted from the skin, in front of the earlobe, as well as from the external auditory canals. Both heads of the TMJD were examined simultaneously at rest, during mouth opening and lateral displacement of the lower jaw. If there was a painful symptom, we noted its localization and relation to the movements of the lower jaw. Palpatorily, we determined the presence of ≪noise phenomena in the area of the joint and specified their nature (clicking, crunching, crepitation). We found out in which phase of opening, closing the mouth (initial, intermediate, final) or lateral displacement of the lower jaw they appear. In order to assess the amplitude of motion in the joint, we measured the distance between the cutting edges of the maxilla and mandible central incisors with a caliper when the mouth was open to the maximum. We also determined the degree of lateral displacement of the lower jaw relative to the midline: we measured the distance in the sagittal plane between the plastic plates inserted in the interdental spaces of the central incisors of the upper and lower jaw. The results obtained were evaluated using I.Yu. Lebedenko et al. (2006) (Table 3).

Table 3

Indicators of the amplitude of the lower jaw movement in the normal range of motion

Movement	Norm, mm
Mouth opening	38-56
Displacement of lower jaw to the right	10-11

Displacement of lower jaw to the left	10-11
Mandibular protrusion	5-7

In addition, we evaluated the displacement of the lower jaw when opening the mouth relative to the midline. Particular attention was paid to the condition of the masticatory muscles. Palpation of the anterior, middle and posterior bundles of the temporalis muscle was performed from the skin side. The masticatory muscle itself was examined both by superficial palpation and bimanuously. The medial pterygoid muscle was palpated from the skin side under the angle of the lower jaw, and if necessary, from the side of the oral cavity. The lateral pterygoid muscle was palpated from the oral cavity side behind the cusp of the upper jaw. Palpation of the sternoclavicularis-mandibularis muscles and muscles of the floor of the mouth was also performed. The degree of muscle tension, character of soreness, presence and localization of trigger points were noted. In order to detect occlusal-articular disorders the bite and occlusal height were evaluated. Diagnostic models were made to clarify the ratio of dental rows. Defects of the dental rows were described using the Kennedy classification. Occlusal contacts were assessed directly in the oral cavity, as well as on models. In addition, occludography was used to characterize the occlusion of the dental rows and identify premature contacts. Occludograms were obtained using a bunion wax plate and a device suggested by M.M. Nasyrov et al.

Fig. 1. Patient K., occludography: a - occludogram acquisition, b - occludogram of patient K., premature contacts presented as through-prints

To characterize the localization of supracondylar contacts more accurately, we placed a wax plate on the model and marked the areas to be abraded with a soft pencil, which corresponded to the through impressions on the occludogram (Fig. 2, 3).

Fig. 2. Patient K., occludogram

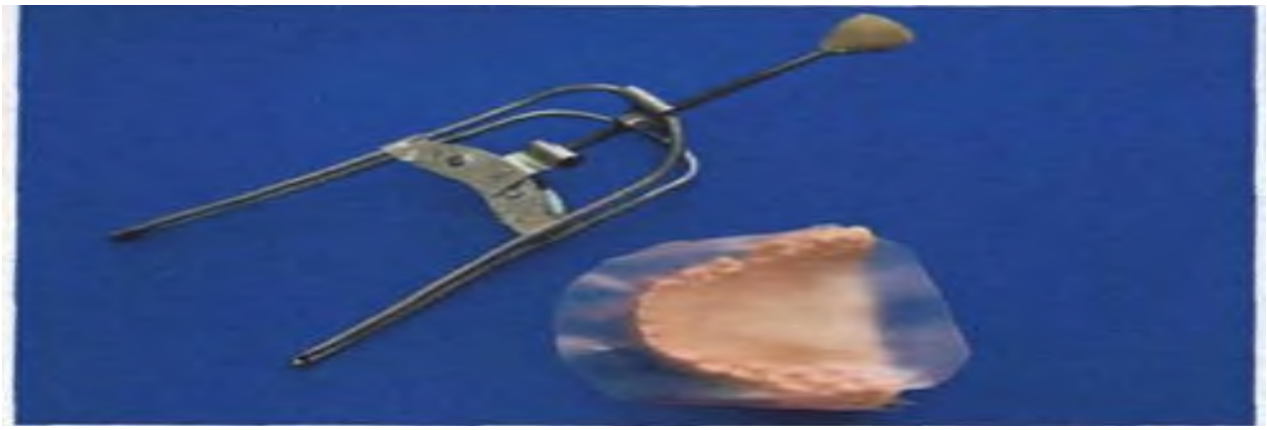

Fig. 3. Patient K., supracondylar contacts are marked on the model with a red pencil

After occludography, we determined a quantitative index of the occludogram, which was calculated using a three-point system for assessing the occlusion of each pair of antagonist teeth: 1 point - no impressions on the occludogram, 2 points - unclear impressions, 3 points - clear or through impressions. The occludogram index was calculated taking into account 14 pairs of antagonist teeth:

The formula for calculation was as follows: K (%) = Z points x 100/ Zxp, where the numerator: E points is the sum of points x 100, the denominator is the highest point score multiplied by the number of pairs of antagonist teeth - n. For an orthognathic bite, the occludogram index is 100%. A lower value of the index indicates an uneven load (absence of contacts or presence of supracontacts) (N.N. Abolmasov, 2004). The obtained results of occlusal-articulatory relationships study in patients were used to make a treatment plan.

2.3 Assessment of psychoemotional status of patients with temporomandibular joint pain dysfunction syndrome

The purpose of the psychological study was to clarify the significance of psycho-emotional disorders in the pathogenesis of TMJ pain dysfunction syndrome. The data obtained as a result of the study were used in the complex treatment of patients of the main group. Patients of the main group and 30 persons without TMJ disorders and any somatic pathology in the decompensation or exacerbation stage (control group) participated in the study. The groups formed were statistically homogeneous by sex, age, social status and demographic indicators. To estimate the psychoemotional sphere of the patients we used Zung Depression Self-Assessment Scale (Zmig W.W., 1965), Spielberg and Hanin personality and reactive anxiety scale (Hanin Y.L., 1976), differential emotions scale by C. Choice of Zung's scale was based on the fact that according to the literature, affective disorders of the depressive spectrum are the most common form of psychiatric pathology in patients with TMJD syndrome. To assess the level of anxiety (reactive anxiety, as a reaction to the disease, and personality anxiety, as a stable characteristic of the person) we used the self-esteem scale, developed by C.D. Spielberg and adapted by him. The level of mood and emotional state was assessed using K. Izaard's scale of differential

emotions, modified by O. D. Spielberg. Izard's scale modified by O.P. Eliseev. The theory of differential emotions defines emotion as a complex process that has neurophysiological, neuromuscular and phenomenological aspects. It is believed that the emotional state of a person has a direct relation to the tone of the transverse striated musculature, which is especially important in TMJ pain dysfunction syndrome. The scales used meet modern requirements, have the necessary informative value, reliability, reproducibility, and accessibility. Application of this combination of scales makes it possible to comprehensively assess the state of the psycho-emotional status of the examinees.

2.4 Radiological methods of diagnosis

All patients with pain dysfunction syndrome underwent radiological examination. Lateral zonography and computed tomography (CT) of the TMJ were used for this purpose. Magnetic resonance imaging (MRI) of the TMJ was used to clarify the diagnosis. We used lateral zonography of the TMJ (52 patients) most frequently in our study. The examination was performed according to the standard technique on a radiological apparatus ≪EDR≫ alternately with the mouth open and closed, on both sides (Fig. 4). The incision was set at 2 to 2.5 cm, the angle of the tube was 8 to 15°. The following zonogram parameters were analyzed: the size of the articular gap, the contours of articular surfaces, the condition of the bone tissue of the joint elements, and the degree of mobility of the mandibular heads was evaluated. Computed tomography was used when there was a need to clarify the diagnosis, when there was suspicion of organic changes in the TMJ (6 patients). For differential diagnosis of painful dysfunction syndrome with internal disorders of the TMJ, magnetic resonance imaging of the TMJ on the ≪Picker MR≫ device was performed in 5 patients. The condition of both joints in the central occlusion position was studied. A dynamic study of the joint in 5 phases of mouth opening was also performed (functionogram). Sections were obtained in the parasagittal and frontal projections, Tl and T2-weighted images. Slice thickness was 2.5 mm, space between them was 0.5 mm.

2.5 Statistical processing of the study results

Statistical processing of the obtained data was performed in accordance with the methods of statistical analysis outlined by V.A. Medik et al. (2001). We preliminarily determined the conformity of the studied indicators in the samples to the law of normal distribution using the x^ criterion. In case of compliance of the studied index values distribution to the law of normal distribution the results of the study were presented as MЃ}s, where M is the arithmetic mean of the index, s is the standard deviation. If the distribution of the values of the studied indicators was different from the normal distribution, the results of the study were presented in the form of Me (iterquartile-57th percentile range), where Me - median, iterquartile range - the values of 25 and 75 percentiles, characterizing the degree of the indicator scatter in the sample. Absolute and relative frequencies were calculated to describe qualitative traits. The relative frequency of a binary trait was estimated using the confidence interval (CI). To determine the significance of differences in samples with normal distribution we used parametric method (Student's t-test for independent groups). If the distribution in the samples did not follow the law of normal distribution, Mann-Whitney U-test and Kolmogorov-Smirnov test for independent groups, and Wilcoxon test for related groups were used to determine the significance of differences. Analysis of differences in frequencies in the two independent groups was performed using Fisher's exact two-sided criterion. Differences in the compared samples were considered reliable if the degree of probability of error-free prediction was 95% or more ($p<0.05$). To assess the relationship between the two variables, we used

correlation analysis with Spearman rank correlation calculation. A $p<0.05$ value was a significant indicator of the difference between the r-coefficient and the O-coefficient. The strength of the correlation was assessed depending on the value of r:

$r<0.25$ - weak correlation;

$0,25<r<0,75$ - moderate correlation;

$r>0.75$ - strong correlation.

CHAPTER III. PECULIARITIES OF CLINICAL AND RADIOLOGICAL PICTURE OF TEMPOROMANDIBULAR JOINT PAIN DYSFUNCTION SYNDROME. STATE OF PSYCHOEMOTIONAL STATUS OF PATIENTS

3.1 Features of the clinical picture of temporomandibular joint pain dysfunction syndrome

The most frequent reason for patients to seek medical help was pain (100%), which was localized in the TMJ and masticatory muscles, had different intensity and varied character (constant, aching, increasing with movements of the lower jaw, shooting, debilitating, pulsating, and constricting). The majority of patients, 46 (76.7%), noted an increase in pain in the afternoon, as well as during chewing. In 14 patients (23.3%), intense pain and feeling of fatigue in the area of the masticatory muscles occurred in the morning hours. In addition, 4 persons (6.7%) complained of discomfort when swallowing. Pain irradiation to different parts of the face (temporal, zygomatic, parotid-chewing, supraorbital, ear, etc.) was noted by 39 patients (65%). In this case pain irradiation could be related to the involvement of masticatory muscles in the pathological process and intra-articular relationships. It should be taken into account that the muscle attachment area, bilaminar zone and articular capsule, unlike the disc and cartilage covering of the bone elements of the joint, have a large number of nerve receptors, another most frequent complaint of patients was the noise phenomena during mandibular movements in the TMJ. And 29 persons (48,3%) noted clicking, 5 persons (8,3%) - combination of crunching and clicking in the joint. A more thorough interview revealed that the clicking was of a non-permanent character and appeared, as a rule, simultaneously with the pain symptom, or later, which is of certain importance in differential diagnosis of the syndrome of painful TMJ dysfunction with internal disorders. Twenty-four patients (40%) complained of restricted mouth opening. At the same time, 18 patients (30%) complained of restriction of mouth opening as a result of pain. Six patients (10%) noted that along with pain they felt a mechanical obstruction, which could indicate anterior displacement of the articular disc as a result of impaired synchronous work of the masticatory muscles. Nine patients (15%) complained of burning in the tongue

and tinnitus, which appeared to be related to intraarticular interactions and involvement of the peripheral branches of nerves anastomosing in the TMJ area: the auricular-caudal nerve, the greater auricular nerve, and the auricular branch of the vagus nerve, which had a connection with the lingual-pharyngeal nerve. Two patients (3.3%), along with painful symptoms, noted the presence of soft tissue edema in the parotid-cheek and suborbital areas after sleep. Thus, analysis of the complaints made by the patients showed that pain complaints were predominant ($p<0,01$), which increased in the second half of the day, as well as during food chewing ($p<0,01$). In addition, irradiation to different parts of the maxillofacial region was a characteristic sign of pain ($p<0.01$). Other complaints of patients, such as noise phenomena in the joint, limitation of mouth opening were observed less frequently and were less characteristic ($p>0,05$). Apparently, this was due to the sequential involvement of the masticatory muscles, joint elements and surrounding tissues in the pathological process as the disease progressed (Table 4).

Table 4.

Main complaints of patients with temporomandibular joint pain dysfunction syndrome

Complaints	**Abs. %**	**Confidence interval**
Pain in the TMJ area and masticatory muscles 2.	**60/100**	**94,0-100**
Crunching, clicking in the joint 2.	**34/56,7**	**43,3-69,4**
Limitation of mouth opening	**24/40,0**	**27,6-53,5**
4. Burning sensation in the tongue, pgum in the ears	**9/15,0**	**7,0-26,6**
5. Swelling of soft tissues	**2**	**0,4-11,5**

Analysis of the history of the disease (anamnesis morbi) showed that only 16 people (26.7%) sought help within a month of the onset of the disease. Almost half of the patients, 28 (46.7%), were referred to the clinic for treatment or applied independently six months or more after the onset of the disease. Only a small

proportion of patients, 6 patients (10%), were referred to the Smolensk Regional Clinical Dental Polyclinic for consultation and treatment with the diagnosis of ≪syndrome of TMJ painful dysfunction. Other patients had the following diagnoses in their referral: arthritis; arthroso-arthritis, arthrosis. Often patients were admitted after consultations with a number of related specialists (surgeon, internist, neurologist, otorhinolaryngologist). Prolonged uncertainty about the diagnosis and the absence of appropriate treatment in the presence of painful symptoms caused patients to distrust doctors, which led to irritability and embitterment. Only 10 patients were prescribed treatment when they sought local care: nonsteroidal anti-inflammatory drugs, physical therapy (electrophoresis with 10% KJ solution, MLT, UHF electric field, phonophoresis with ≪Chondroxide≫ ointment). However, these therapeutic measures did not result in the relief of clinical manifestations of the disease, which was the reason for referring patients for consultation and treatment to the Samarkand Regional Clinical Dental Polyclinic: 14 patients (23.3%) associated the onset of the disease with hypothermia; 8 patients (13.3%) noted that they had been to a dentist's appointment the day before, where they stayed with their mouth open for a long time, or had a complicated tooth extraction; 7 patients (11.7%) indicated that they had experienced stress; Six patients (10%) attributed the development of pathology to previous prosthetics; 5 patients (8.3%) noted trauma to the TMJ area in their anamnesis; 3 patients (5%) cited wide opening of the mouth during yawning as the cause. Seventeen patients (28.4%) could not state the cause of the disease (Table 5).

Table 5.

Causes of temporomandibular joint pain dysfunction syndrome according to anamnesis

Reasons	Abs / %	Confidence interval
1. Overcooling	14/23,3	13,4-36,0
2. Prolonged dental treatment, complicated	8/13,3	5,9-24,6

extraction		
3. Stress	7/11,7	4,8-22,6
4. Prosthetics	6/10,0	3,8-20,5
5.Traumatic injury	5/8,3	2,7-18,3
6. Wide mouth opening	3/5,0	1,0-13,9
7. Could not specify the cause of the disease	17/28,4	17,5-41,5
Total	60/100	

In patients with suspected masticatory muscle parafunctions as a risk factor for the development of the disease, an in-depth anamnesis was taken. It was found that 41 patients (68.3%) among those examined had one or another disorder of masticatory muscles and in some cases their combination. Thus, 12 patients (20%) showed nocturnal teeth grinding, 10 people (16,7%) noted that they were in the habit of clenching their teeth during the day, especially in case of emotional overstrain. When determining the preferential side of chewing, it was found that 32 people (53.3%) chewed food only on one side of the dentition. In 19 of them (59,4%) the pathological process was localized on the side corresponding to chewing. In addition, we identified a clear correlation between the timing of the onset or increase in pain symptoms and the type of parafunction. Thus, patients experiencing pain and feeling of fatigue in the masticatory muscles in the morning hours after sleep, as a rule, had parafunction in the form of nocturnal teeth grinding ($p<0.05$). Patients whose pain intensified during the day or during meals had the bad habit of clenching their teeth and had habitual unilateral chewing ($p<0.05$). Thus, we can assume that patients with TMJ pain dysfunction syndrome are characterized by the presence of bad habits and masticatory muscle parafunctions - 68.3% [55.0; 79.7], ($p<0.01$). Probably habitual unilateral chewing contributes to the development of the pathological process on the same side. In addition, the type of masticatory muscle parafunction influences the time of pain symptom onset or intensification during the day ($p<0.05$).

3.1.1Comparative assessment of the results of complex treatment of patients in the main group and comparison group

The effectiveness of treatment measures was assessed by repeated examinations performed 2 weeks, a month, 6 months, and a year after the start of treatment. In addition, electroneuromyographic and psychological examinations were repeated for patients in the main group after 3 months. The degree of pain symptom relief was assessed at the examination after 2 weeks, since we could conduct further therapy only in the absence of pronounced pain sensations. During clinical examination, we paid attention to the presence of spontaneous pain, painfulness when moving the lower jaw, pain when palpating the masticatory muscles, determined the presence of trigger points (TT). Preliminary results of treatment showed that the methods of pain symptom control in both the main group and the comparison group were quite effective. Nevertheless, prescription of central muscle relaxant, correction of psycho-emotional status, complex physiotherapy with electrical stimulation and running magnetic field allowed to achieve faster improvement of the condition ($p<0,05$). As a consequence, the patients of the main group had a higher subjective assessment of the efficiency of the therapy, which contributed to a constructive mood and an optimistic view of the continuation of further treatment (Table 6).

Table 6

Degree of pain symptom relief in patients in the main group and comparison group after 2 weeks from the start of treatment

Clinical symptoms	Main group (n=30) Abs / %	Comparison group (n=30) Abs / %	p
Spontaneous pain in the TMJ and masticatory muscles		6/20	p<0,05
Pain on palpation of the	3/10	7 / 23,3	p<0,05

TMJ			
Pain while moving the lower jaw	5/16,7	12/40	p<0,05
Pain while palpating the masticatory muscles	5/16,7	12/40	p<0,05
Presence of TM in the muscles	1/3,3	7/23,3	p<0,05

We should also note that after 2 weeks, deviation of the lower jaw, clicking, crepitations when opening the mouth remained in both groups of patients, although the severity of these symptoms at the time of the repeated examination was less. In our opinion, these symptoms were related to the presence of occlusal-articular disorders in patients, which could not be eliminated during this period of time due to the presence of pain symptoms. Thus, the first phase of treatment in the main group was more effective than in the comparison group. This allowed us to proceed more quickly to the next stage of complex therapy and to use such methods of treatment as myogymnastics, occlusal splints, selective grinding and prosthetics. The repeated examination one month later revealed that there were significant changes in the clinical picture of the patients in both the main group and the comparison group. As can be seen from the results of the examination, against the background of a significant improvement of the condition in the comparison group, 12 patients (40%) persistently retained some symptoms of the disease, while in the main group only 6 patients (20%) had a similar picture (Table 25). When comparing the results of treatment in the two groups, it should be noted that they differed significantly not only in the degree of pain symptom relief but also in a number of signs associated with discoordination of the masticatory muscles and intra-articular relationships (pneumonia, restriction of mouth opening). Nevertheless, such symptoms as clicking, deviation of the lower jaw when opening the mouth remained in some patients of the main group. This suggests that the pathological stereotype of lower jaw movements, parafunctions of masticatory muscles is difficult to level in such a short period of time. It requires more time, careful correction of occlusal-

articulatory relationships and, undoubtedly, active participation of the patient himself. Needle electromyography was repeated in 7 patients (23.3%) whose primary examination revealed persistent spontaneous activity of the motor units of the masticatory muscles themselves at rest. No resting activity was detected in any of the patients. Thus, repeated electroneuromyographic examination showed that three months after treatment, not only did the amplitude-frequency parameters of bioelectrical activity of the masticatory muscles themselves recover, but also the suprasegmental control, which realizes the nociceptive function of mimic and pericranial muscles, was normalized in the main group patients. In addition, the interneuronal inhibitory activity of the stem structures decreased. The study of the psychoemotional status also revealed a number of changes. When assessing the results, there was a statistically significant decrease in the values of the Zung Depression Self-Assessment Scale and Spielberg-Hanin Reactive Anxiety Scale ($p<0.05$). Values of personal anxiety also tended to decrease. However, there were no significant differences before and after treatment ($p>0.05$). Apparently, this is due to the fact that personal anxiety is an individual indicator, reflecting the peculiarities of a person's personality, and is a stable characteristic. The parameters of the Isard differential emotion scale also did not change significantly after 3 months of treatment. According to the results of repeated neuropsychological examination we can state that the conducted treatment was effective and contributed to restoration of normal psycho-emotional condition of the patients. By the 6th month of treatment, the clinical manifestations of the TMJ pain dysfunction syndrome were approximately identical in both groups. The observed dynamics of improvement in the course of treatment can be explained by the fact that by this time, both in the main group and in the comparison group, comprehensive treatment had been completed. The planned methods aimed at eliminating pain symptoms, restoring intra-articular relationships, and correcting occlusal disorders were carried out. At this stage the two groups differed statistically significantly only in the presence of clicks in the TMJ and deviation of the mandible. It was probably due to the fact that the methods of restoration of intra-articular relations and correction of

occlusal disorders were used later in the comparison group. At the follow-up examination one year after treatment, 25 patients (83.3%) of the main group and 24 patients (80%) of the comparison group were examined. Clinical recovery was observed in 21 patients (84%) of those examined repeatedly in the main group, 1 patient (4%) had relapse of the disease, 3 patients (12%) still had clicking in the TMJ and deviation of the lower jaw while opening the mouth. The results in the comparison group were somewhat different. Complete regression of the clinical symptoms was observed in 15 patients (62.5%). At the same time, the disease relapsed in 5 patients (20,8%), in 4 patients (16,7%) we detected clicking and deviation of the lower jaw. We should note that statistical processing of the data did not reveal any significant differences in the results of treatment of the patients of the two groups at this stage ($p>0.05$).

Thus, the comparative analysis of the results showed that the treatment of the main group patients was more effective. Thanks to the individual complex approach and the use of clinical and radiological, electroneuromyographic and neuropsychological examinations we managed to achieve faster and more stable relief of pain symptoms, which allowed the comparison group to start the second and the third stages of treatment earlier. Based on the results of the study, we developed an algorithm for diagnosis and treatment of patients with TMJ pain dysfunction syndrome, according to which patients are recommended to undergo clinical, radiological, electromyographic, and psychological examination. Depending on the results obtained, patients are prescribed individual complex pathogenetic therapy, including the use of medications, physical therapy, prosthetics, selective grinding, myogymnastics, compression of trigger points. For each of the above-mentioned methods of treatment, clear indications are defined, which allows increasing the efficiency and reducing the period of treatment of patients.

3.1.3 Objective examination of patients with temporomandibular joint pain dysfunction syndrome

On external examination, facial asymmetry was detected in 8 people (13.3%). Five of them (8.3%) had thickening of the masseter muscle itself. When clarifying the

anamnesis data, we found that these patients had been chewing food on one side of the dentition for a long time. Since the chewing side and the side of the muscle changes coincided, we assumed that the thickening was due to hypertrophy. A slight asymmetry of the face due to soft tissue edema of the suborbital and parotid-chewing areas was detected in 2 patients (3.3%). Soft tissue edema in this case was associated with the involvement of the masticatory and wing muscles proper in the pathological process, which disturbed blood outflow from the wing venous plexus and deep temporal vein. One patient (1.7%) had facial asymmetry due to congenital underdevelopment of the mandible.

Palpation of the masticatory muscles on the affected side was painful in all patients without exception, while pain on palpation in the region of the head of the TMJ was observed only in 38 patients (63.3%). These data support the idea that it is the muscles that are initially involved in the pathological process, followed by the intraarticular relationship disorders, which is the source of pain in the joint area. We found out that masticatory muscles were affected with different frequency.

Table 2.

Frequency of masticatory muscle soreness on palpation in patients with pain dysfunction syndrome

Muscle	Abs / %	Confidence interval
1. masseter muscle itself	8/83,3	71,4-91,7
2. Lateral pterygoid muscle	6/ 73,3	60,3-83,9
3. Medial pterygoid muscle	3/60,0	46,5 - 72,4
4. Temporalis muscle	18/13,3	5,9-24,6

The masticatory muscle itself was most frequently painful on manual examination in 8 patients (83.3%). Pain on palpation of the lateral pterygoid muscle was observed in 6 patients (73.3%) and the medial pterygoid muscle in 36 patients (60%). The temporalis muscle was involved in the pathological process least frequently, only in 8 patients (13.3%) (Table 2). As a rule, several masticatory

muscles were painful on palpation simultaneously in patients with pain dysfunction syndrome. The masseter, lateral, and medial wing muscles were most frequently affected in 2 patients (26.7%). The masseter and lateral wing muscles were painful simultaneously in 4 patients (20%). The masseter muscle itself was painful on palpation in 7 patients (11.7%). Painfulness on palpation in all masticatory muscles was also observed in 7 patients (11.7%). In some cases, along with the masseter muscles, the sternocleidomastoid muscle was painful on palpation . При пальпаторном исследовании у 15 пациента (68,3%) в жевательных мышцах были выявлены триггерные точки (ТТ) в виде болезненных уплотнений, тяжей или участков неизмененных тканей. Their palpation caused sharp pain, irradiating to different parts of the maxillofacial region. Most frequently, PTs were localized in the masseter muscle itself - in 38 patients (92.7%). They were palpated in the lateral pterygoid muscle in 7 patients (17.1%), in the medial pterygoid in 4 (9.8%), in the sternoclavicularis in 3 (7.3%), and in the temporalis in only 2 (4.9%)) (Table 7). It was found that in 10 patients (24.4%) TT were simultaneously localized in several muscles. Of these, chewing muscles were most often affected with other muscles - in 9 of 10 observations (90%) (Fig. 14). The presence of TT in the muscles determined the intensity and quality of the pain symptom. It was most pronounced in patients with simultaneous localization of TT in several masticatory muscles. Patients with TT in the medial pterygoid muscle reported painful swallowing. In patients with TT localized in the masseter muscle itself, a characteristic clinical sign was pain when opening the mouth. Clicking in the TMJ and periodic limitation of mouth opening as a result of mechanical obstruction were observed more frequently in patients with the presence of TT in the lateral pterygoid muscle. Thus, according to the results of clinical examination of masticatory muscles we can conclude that masticatory muscles proper were most frequently involved in the pathological process ($p<0,01$) followed by lateral ($p<0,01$) and medial wing muscles ($p=0,03$). And the affection of one or another muscle determines the predominance of these or those symptoms. Clinical manifestations of the disease: pain in the area of the joint and masticatory muscles, clicking, limitation of mouth opening are related to the

masticatory, lateral and medial wing muscles most frequently involved in the pathological process. In addition, we can assume that the severity of the pain symptom is determined by the number of muscles in which the TTs are located.

3.2 Study of temporomandibular joint function

During mandibular movements in the TMJ, noise phenomena were detected in 24 patients (40%): in 20 of them (33.3%) as clicks, in 3 (5%) as crunches, and in 1 (1.7%) as crepitations. At the same time, only in 6 persons (10%) the clicking in the joint occurred in the initial phase of opening and in the final phase of closing the mouth. Palpation of the lateral pterygoid muscle in these patients was sharply painful. Clicks in the majority of patients were non-permanent and were not associated with the phases of mandibular movement. Patients who had crunching and crepitations in the articular region, as a rule, had secondary structural changes of the articular surfaces during X-ray examination. The amplitude of the mouth opening in patients with the syndrome of painful VRS dysfunction was reduced to 40.8+9.5 mm compared to the normal value of 47.0+9.0 mm ($p<0.05$). It should be noted that most patients had restriction of mouth opening due to painful sensations they experienced while doing so. In 5 patients (8.3%) the restriction developed as a result of mechanical obstruction. In this case, the lower jaw shifted to the side of the lesion. After several lateral movements the mouth opened wider, however, after some time the block occurred again. These patients were also characterized by sharply painful palpation of the lateral pterygoid muscle on the side of the pathological process. When opening the mouth, displacement of the lower jaw to the side of the midline was detected in 25 people (41.7%). When identifying the correlation between the side of the lower jaw displacement during mouth opening and the side of the lesion, negative results were obtained ($p>0.05$). Apparently, this is due to different reasons that caused the displacement: asynchronous work of the masticatory muscles on the right and left side, changes in the position of the articular discs. When assessing the lateral movements of the mandible, we found that the average amplitude of displacement was 7.4+1.4 mm and was below the normal value of 10.5+0.5 mm ($p<0.05$). In addition, the degree of mandibular displacement to the

healthy side was less, 6.8+1.6 mm, than to the affected side, 8.0+1.8 mm ($p<0.05$). We also noted that displacement of the mandible to the healthy side caused increased pain. In general these data allow us to draw a conclusion about the involvement of medial and lateral wing muscles into the pathological process, as it is them who move the jaw to the opposite side during unilateral contraction. The amplitude of the mandibular displacement forward was also limited in comparison with the normal value. The patients had a value of 4.3+1.3 mm, whereas the normal value was 6.0+1.0 mm ($P<0.05$). Thus, the functional study showed that clicks in the TMJ were detected in 33.3% of patients. As a rule, they were of a non-permanent character, were not associated with the phases of mandibular movement and, apparently, developed as a result of the incoming intra-articular relationship disorder. Jaw displacement during mouth opening did not depend on the side of the lesion and could be caused by various reasons (change in the position of the articular discs, asynchronous muscle work).

3.3 Results of Radial Examination of Patients with Temporomandibular Joint Pain Syndrome

The analysis of the results of lateral zonography, computed tomography and magnetic resonance imaging of the TMJ revealed correct intraarticular relationships in almost half of the patients (29 patients (48.3%)). Distal location of the head of the condylar process of the lower jaw was observed in 28 patients (46.7%) and anterior in 3 patients (5%). Asymmetrical location of the mandibular heads was detected in 15 patients (25%). The contours of the articular surfaces were smooth and clear in the majority of patients - 49 patients (81,7%). No pathological changes in the bony structures of the TMJ were observed. However, structural changes in the joint elements were detected in 11 patients (18.3%) whose disease duration was about a year or more. Thus, sclerosis of articular surfaces was detected in 6 patients (10%). Deformation of the mandibular heads was observed in 3 patients (5%) (Fig. 7), and 2 patients (3.3%) had their cystic remodeling.

Fig. 7. Patient T., lateral zonograms of the TMJ on both sides with the mouth maximally open: a - the head of the mandible on the right is deformed and is located on the posterior slope of the articular tubercle

Fig. 8. Patient T., lateral TMJ zonograms from both sides with the mouth maximally open: the head of the. The head of the lower jaw on the left is on the tip of the articular tubercle.

To establish the relationship between the presence of structural changes and the duration of the disease, we used Spearman rank correlation method. The correlation coefficient (r) was 0.71 ($p<0.05$), which corresponds to a moderate direct relationship between the studied features. This suggests that the long-term course of the syndrome of painful TMJ dysfunction may lead to pathological changes in the bony elements of the joint. In the study of TMJD function in the majority of patients, 29 patients (81.7%), we found a normal degree of mobility of the mandibular heads - at maximum mouth opening, the head of the condylar process was located at the apex of the articular tubercle. Hypermobility in the form of subluxation of the

articular head was observed in 7 patients (10%). More informative data on functional changes in the TMJ were obtained by magnetic resonance imaging.

Unilateral limitation of movements of the lower jaw head was detected in 5 patients (8.3%). Clinically, such changes were accompanied by restriction of the mouth opening as a result of the presence of a mechanical obstacle, displacement of the lower jaw to the affected side. Palpation of the lateral pterygoid muscle in these patients was sharply painful. These changes could indicate anterior recurrent dislocation of the articular disc. Thus, according to the analysis of the results of radial methods of examination, we can assume that changes in the syndrome of painful TMJ dysfunction are more often of a functional nature and are associated with disturbed relations of the joint elements and discoordinated work of the masticatory muscles. The majority of patients we examined had no structural disorders of articular surfaces - 81.7% ($p<0.01$). Nevertheless, the long-term course of the disease may have contributed to the development of sclerosis, deformity, or cystic remodeling of the condylar head of the mandibular condyle.

3.4 Treatment of Patients with Temporomandibular Joint Pain Dysfunction Syndrome

Before prescribing complex therapy, all patients were interviewed, during which the essence of the disease was explained in an easy-to-understand manner. We paid attention to the role of stressful situations, occlusion-articulation disorders in the development of the syndrome of painful TMJ dysfunction. We persuaded that it was necessary to take an active part in our own treatment and follow all recommendations. Patient and attentive attitude helped to establish a good contact with the patient and strengthen his faith in recovery. The positive result of the treatment performed depended a lot on it. Treatment of the patients in both groups was complex. It could be divided into three stages. The first stage was pain symptom control. For this purpose, medication and physical therapy were used. The second stage consisted in normalizing the functional state of the masticatory muscles and correcting the anatomical relations of the joint elements. Patients were taught to

perform myogymnastics, massage masticatory muscles, and compress trigger points. At the same stage, occlusal splints were made. The third stage included methods aimed at restoring normal occlusal-articular relations. For this purpose, selective grinding of the teeth and prosthetics were performed when indicated. Note that the second and third stages of treatment could be performed simultaneously. The main condition in this case was the absence of pain symptoms. The primary task in the treatment of patients with this disease was to control the pain symptom. For this purpose, nimesulide (≪Nice≫) 100 mg twice a day for 5-7 days was prescribed to the patients. At the same time, there was carried out physical therapy - fluctuorization on the area of masticatory muscles. This is a physical action, which is the application of sinusoidal alternating current, randomly changing in amplitude and magnitude, for therapeutic purposes. The procedures were carried out with the ASB 2 physiotherapeutic apparatus. One of the electrodes was placed on the masseter muscle, the second was inserted into the retromolar space. Bipolar symmetrical current was applied in a low dose (up to 1 mA/cm) with transition to a medium dose (2 mA/cm^) by the 3rd session. The duration of the procedure was 10 minutes, the course of treatment was 7-10 procedures. Patients with the presence of structural changes in the bone elements of the joint (5 patients, 16.7%) were administered ultraphonophoresis with ≪Hondroxide≫ ointment. This drug has analgesic, anti-inflammatory effects and stimulates regenerative processes. The treatment was carried out on the apparatus UZT - 1.02 C. The skin in the area of VCMS and the vibrator head was lubricated with ointment. The transmitter with an area of 4 cm was placed on the skin in the projection of the joint. Using circular massaging movements, the transducer was moved along the skin above the joint and around it. The mode of operation was pulse with pulse duration of 4 ms and intensity of 0.4 W/cm. Exposure time was 10 minutes, treatment course - 10 procedures. In addition, at this stage of treatment, oral cavity sanation was performed as indicated.

DISCUSSION OF RESEARCH RESULTS

Pain dysfunction syndrome occupies a special place among TMJ disorders, accounting for up to 75% of all cases of joint pathology, and the number of patients has continued to increase in recent years. In spite of the continuous interest of researchers to this problem and numerous publications devoted to it, the questions of etiology and pathogenesis of the disease are still unsolved. Perhaps that's why the methods used by different authors for diagnosing and treating patients are rather diverse. Generally, the choice of one or another method is determined by the author's adherence to one of the concepts of the disease development. Unfortunately, the current situation complicates the work of practical doctors, which in turn affects the diagnostic and treatment process. As a result, patients often become hostages of their condition and are forced to repeatedly over a long period of time to seek medical help to specialists in various fields, and often without results. In this connection, it becomes clear that it is necessary to create an algorithm for diagnosis and treatment of patients with VEGF pain dysfunction syndrome on the basis of the existing ideas about the etiology and pathogenesis of the disease. Many researchers point to the role of occlusal and articulatory disorders in the development of TMJ pain dysfunction syndrome. In our study, bite anomalies were detected in 25% of patients. Of these, a deep bite was detected in 11.7% of cases, a crossbite in 8.3%, and prognathia in 5%. Deep incisal overlap accounted for 8.3%). Orthognathic bite was diagnosed in 66.7% of patients. Our results confirm the data of V.D. Panteleev (2002), S.G. Sangulia (2005), V.N. Trezubov and E.A. Bulycheva (2000) obtained in a similar study. They observed an orthognathic bite in most patients, and the leading role among bite anomalies belonged to a deep bite. Dental defects were detected in 53.3% of patients, which corresponds to the data of SJ. Kondrashin (2007), V.N. Trezubov and E.A. Bulycheva (2000), who observed similar changes in 58.5% and 50.48% of patients, respectively. S.G. Sangulia (2005) in her study revealed dental defects in 77, 97% of patients. In further analysis, we found that 65.6% of the patients had small dental defects. The number of patients with medium-length defects was 21.9%. Large defects occurred in 12.5% of patients. Most

frequently, the defects of the dentition were localized on the lower jaw (40.6%) or on both jaws simultaneously (37.5%). On the upper jaw defects were found in 21.9%) of patients. The majority of patients had Kennedy class III defects - 70.5%. Of these, defects of class I subclass 1 accounted for 22.7%. Class II defects were detected in 25% of patients. Class II class 1 subclass accounted for 9.1%. Class I occurred in 4.5% of patients and was accompanied by decreased occlusal height. The results we obtained correspond to the data of A.F. Khayrutdinova (2007). In addition, V.N. Trezubov and E.A. Bulycheva (2000) also note in their study that the number of persons with decreased occlusal height in TMJ dysfunction was insignificant. Thus, according to our data, patients with the syndrome of painful TMJ dysfunction were dominated by small included dental defects. On this basis, we can assume that even small extended defects played a significant role in the development of the disease. This is confirmed by the fact that 81.3% of patients with included defects developed habitual unilateral chewing on the side opposite to the defect. Dental deformities in the form of tilting of the teeth toward the defect and advancement of the antagonist teeth were detected in 23.3% of patients. In addition, supracondylar contacts were detected in 25% of patients during occludography. V.D. Panteleev (2002) and A.F. Khairutdinova (2007) point out similar data in their studies. To summarize, it should be noted that the majority of patients with TMJ pain dysfunction syndrome had an orthognathic bite ($p<0.01$). Dental defects were identified in every second patient. Moreover, included defects of small extent prevailed ($p<0.01$), which, in all likelihood, were the cause of development of habitual unilateral chewing in patients. We agree with the opinion of N.K. Loginova (2004) who states that with unilateral type of chewing the dysfunction of the masticatory apparatus develops, which is characterized by disturbances of coordinated work of masticatory muscles, loss of coordination of phases of the chewing cycle, symmetric movements of the lower jaw with development of pathological changes in the temporomandibular joints. We believe that the deformities of the dentition, supracondylar contacts, and egrets aggravate this process by creating an obstacle to the smooth and unobstructed sliding of the

mandible. The masticatory muscles are programmed to avoid occlusal obstruction under the new conditions. In such a situation, some muscles are strained by the excessive functional load, while the activity of other muscles decreases. Conditions are created for the development of the syndrome of painful TMJ dysfunction. Therefore, it is difficult not to agree with the opinion of Petrosov Y.A. (1981) that an important role in the pathogenesis of painful TMJ dysfunction syndrome is played not so much by bite anomalies as by defects and deformations of the dental rows, as well as the presence of premature occlusal contacts. We observed bilateral end defects accompanied by decreased occlusal height in patients with TMJ pain dysfunction syndrome much less frequently (4.5%) than included ones (70.5%). It is known that this type of defect causes direct spatial topographic-anatomical changes in the TMJ, translocation of compression zones, which causes morphological restructuring of its elements, dystrophic changes in them (Kovalkov V.K., 1995; Kostina I.N., 2002; Kondrashin S.Yu., 2007). Therefore, it can be assumed that bilateral end defects are more conducive to the development of articular diseases and, in particular, osteoarthritis rather than syndrome of painful TMJ dysfunction. The important role of occlusal disorders in the development of pain dysfunction syndrome cannot be denied. Nevertheless, when examining patients, we found that 66.7% of patients had an orthognathic bite and 46.7% had a complete dentition. In this regard, we can assume that there are no less significant non-occlusive factors that can lead to the development of this pathology. The researchers consider disorders of the psychoemotional status of patients to be one of such factors. Our neuropsychological examination allowed us to identify indicators corresponding to the state of depression in 30% of patients with TMJ pain dysfunction syndrome according to the Tsung's scale. It should also be noted that the group of patients as a whole was characterized by higher values on this scale than the control group ($p<0.05$). Similar changes in patients with pain dysfunction syndrome were observed by R.A. Pshepi (2002), F.F. Losev et al. (2004), E.A. Gorozhankina (2005). Using Spearman's rank correlation method, we found that there was a direct moderate correlation between the timing of the disease and the

Tsung's scale scores ($r=0.62$, $p<0.05$). Having clarified the anamnesis data, we found out that all patients with high Tsung's scale values suffered from TMJ pain dysfunction syndrome for 11 months or more, had a pronounced pain symptom, consulted various specialists to no avail, and the treatment prescribed to them was often ineffective. On this basis, we assume that disorders corresponding to depressive ones in this case were a consequence of the long-term course of TMJ pain dysfunction syndrome. According to the results of the psychoemotional status study, we also found that the patients were characterized by a statistically significant increase in the level of personal and reactive anxiety ($p<0.05$), which corresponds to the data obtained by I.M. Strandstrom (2004). When studying the relationship between the level of anxiety and duration of the course of the disease, we obtained a negative result ($p>0.05$). Probably, these disorders did not depend on the duration of the disease and were stable personal characteristics. Assessment of emotional state and mood, which was carried out according to C. Izard's scale, revealed a tendency to decrease patients' emotional background. However, this was not statistically confirmed ($p>0.05$). Thus, based on our study of the psychoemotional status, we can state that patients with TMJ pain dysfunction syndrome more often had conditions corresponding to the depressive disorder than healthy individuals. At the same time, these disorders were probably a consequence of the long-term pain symptom accompanying the disease, rather than the cause of its development. As a factor contributing to the development of the disease and influencing the severity of its clinical manifestations, we should probably consider a high level of anxiety, especially personality anxiety. It is a stable characteristic of a person's personality and reflects his tendency to perceive a wide range of situations as stressful, for no apparent objective reason. It follows that patients with pain dysfunction syndrome, who have a high level of personal anxiety, are more often in a state of stress, which is initiated and produced by themselves. It is known that a physiological reaction to stress is an increase in tension of the transverse striated muscles, including the masticatory muscles. This, in turn, can lead to a change in the stereotype of masticatory movements, the development of functional disharmony, and, as a

consequence, the occurrence of disease (Gross M.D., Matthews J.D., 1986). Researchers consider chewing muscle parafunctions (nocturnal teeth grinding, intermittent jaw clenching, non-drinking chewing, etc.) as another cause of the development of TMJ pain dysfunction syndrome (Travell JG, Simone D.G. 1989; Trezubov V.N., Bulycheva E.A., 2000; Schiffinan E.H. et al., 1992; Dao T.T. et al., 1994; Glaros A.G. et al., 2000). We found in our study that 68.3% of patients had some form of masticatory muscle impairment or PIX combination. Thus, 20%. patients were found to have nocturnal teeth grinding, and 16.7% had the habit of clenching their teeth during the day, especially during emotional distress. Habitual unilateral chewing was detected in 53.3%) of the patients. In 59.4% of them, the pathological process was localized on the side corresponding to chewing. In 41,7% of patients with masticatory muscle parafunctions the examination of the oral cavity revealed pronounced facets of erasure on the teeth. In addition, we found a clear correlation between the time of pain symptom onset or intensification and the type of parafunction. Thus, patients experiencing pain and feeling of fatigue in the masticatory muscles in the morning hours after sleep had parafunction in the form of nocturnal teeth grinding ($p<0.05$). Patients whose pain intensified during the day, or while eating, had a bad habit of clenching their teeth, or had habitual unilateral chewing ($p<0,05$). Based on the results obtained, we can conclude that the presence of masticatory muscle parafunctions was characteristic of patients with the syndrome of painful dysfunction of the TMJ ($p<0.01$). In addition, the type of masticatory muscle parafunction influenced the time of pain symptom onset or intensification during the day ($p<0.05$). If we analyze the role of these disorders in the pathogenesis of pain dysfunction syndrome, it becomes clear that they are one of the links in the mechanism of disease development and are not of primary nature. Thus, out of all masticatory muscle disorders, 78% were habitual unilateral chewing, which developed in patients as a consequence of dental defects. It is also known that emotional overstrain can contribute to the development of nocturnal grinding of the teeth, clenching them during the day (E.A. Bulycheva, 2007; Agard et al., 2001; Baskan S., Zengingul A., 2006). Based on our analysis it follows that in the

development of the syndrome of painful TMJ dysfunction an important role, along with occlusal disorders, changes in the psycho-emotional state of patients. Parafunctions of the masticatory muscles appear to be an intermediate link in the mechanism of disease development. Circumstances such as hypothermia, prolonged exposure to the dentist, and wide opening of the mouth, which patients reported as the cause of the pathology, should probably be considered as a trigger or provoking factor in the pathogenesis of pain dysfunction syndrome. We would like to note, that the results we obtained are necessary for understanding the peculiarities of clinical picture of the disease and carrying out purposeful diagnostic search and making up a plan of individual complex pathogenetic treatment of the patients. Correction of psychoemotional status of the main group patients with psychometric scales' values insignificantly deviating from the normal ones was carried out using sedative preparations of plant origin. Patients with high values of the scales were referred to a neurologist for specification of the diagnosis and prescription of appropriate treatment. Minor tranquilizers, benzodiazepine derivatives (diazepam, no-zepam), antidepressants, and selective serotonin reuptake inhibitors (fluoxetine) were used as treatment agents in this case. The second and third stages of patient treatment were the same in both groups. On the basis of the data obtained, we can state that the treatment of the patients in both the main and the control groups was effective. However, positive results were achieved faster in the main group due to more effective first stage of treatment and application of methods for psycho-emotional status correction. Based on the results of the study, it follows that the treatment of patients with TMJ pain dysfunction syndrome requires an individual comprehensive approach based on ideas about the etiology and pathogenesis of the disease, as well as the results of clinical, radiological, psychological and electroneuromyographic studies.

CONCLUSIONS

1. Temporomandibular joint pain dysfunction syndrome is caused by defects and deformities of the teeth as well as premature occlusal contacts.

2. the activity of suprasegmental structures of the central nervous system depends on the level of anxiety and emotional state of patients with temporomandibular joint pain dysfunction syndrome.

3. the algorithm of treatment of patients with temporomandibular joint pain dysfunction syndrome, developed on the basis of the data of complex examination, gives the opportunity to change the tactics of treatment taking into account the causal mechanisms of the disease development.

PRACTICAL GUIDANCE

1. The complex pathogenetic treatment of patients with temporomandibular joint pain dysfunction syndrome should include, if indicated, replacement of dental defects, elimination of deformities, selective grinding of teeth.

2. Patients with temporomandibular joint pain dysfunction syndrome are recommended to undergo psychological examination using Zung, Spielberg-Hanin, and Izard psychometric scales. If indicators corresponding to depression, high level of anxiety, and hypothymia are detected, patients should be referred for consultation to a neurologist.

3. If there is persistent spontaneous activity of the motor units of the masticatory muscles proper in patients with temporomandibular joint pain dysfunction syndrome, the inclusion of myorelaxant of central type of action - mydocalm - in the complex therapy is reasonable, which allows a more rapid relief of pain symptom.

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