JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS
VOLUME 05, ISSUE 01
MOPNTHLY JOURNALS
ISSN NUMBER: 2751-4390
IMPACT FACTOR: 9,08

THE SPECIFICS OF DIAGNOSING THE SYNDROME OF PAIN DYSFUNCTION OF THE TEMPOROMANDIBULAR JOINT ASSOCIATED WITH AGE-RELATED CHANGES

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Annotation

In the period from 2021 to 2024, 235 patients with temporomandibular joint pain syndrome (TMJS) without dental anomalies were examined. Among them are 32 men and 203 women aged from 15 to 35 years. The patients were divided into three groups: the first group (63 people) - adolescence; the second group (102 people) - adolescence; the third group (70 people) is the first mature age. All participants underwent research in the department of maxillofacial surgery of the Bukhara Regional Multidisciplinary Medical Center. To establish an accurate diagnosis, modern methods of x-ray and laboratory examination were used. A study of the results of traditional and specialized treatment demonstrated a clear advantage of the latter in optimizing the recovery process for pain syndrome in the temporomandibular joint. The clinical features of the syndrome of painful dysfunction of the temporomandibular joint in conditions of painful spasm of the masticatory muscles in patients of different age groups were studied. In mature adults, this syndrome manifests itself more clearly, differs in character, sensory perception and emotional reaction to pain, and is also caused by a greater number of factors compared to adolescents and young adults.

Key words

Dysfunction of the temporomandibular joint, accompanied by pain, covers various age groups and can be accompanied by hypertonicity of the masticatory muscles, as well as disturbances in the movement of the lower jaw.

Relevance

The temporomandibular joint (TMJ) is one of the most complex, incongruent joints in the human body and plays an important role in maintaining the functions of chewing and sound production. However, this joint is also susceptible to various age-related changes, which can lead to the development of various pathological conditions and impaired functions of the entire maxillary system. In this regard, the study of age-related changes in the TMJ and their impact on the development of diseases is an urgent problem in modern medicine, especially since it is the third most common disease of the maxillofacial region. [1]. In this study, we will focus on identifying the most common diseases associated with age-related changes in the TMJ, such as osteoarthritis and arthritis, and assessing the condition of the joint in older people. In the field of modern dentistry, special attention should be paid to the timely detection and effective treatment of a common pathological condition known as dysfunctional pain syndrome in the temporomandibular joints (TMJ). This condition, also referred to as facial myofascial pain, TMJ dysfunction, TMJ inferiority syndrome and temporomandibular dysfunctional syndrome, is a significant problem for specialists. [5, 4, 7, 11]. The complexity of diagnosis is due to the lack of a unified theory about the causes and the variety of clinical manifestations that can change over time, which makes it difficult to determine the exact nature of the disease. [9].

In dynamically developing dentistry, there is an alarming tendency to "rejuvenate" patients: even children from the age of five are increasingly diagnosed with dysfunctional TMJ diseases [10]. Despite the active development of scientific research in the field of syndrome diagnosis,

classical clinical methods remain the main tools. (2, 3, 5, 8-9, 10–11). The disease goes through two faces: the initial dysfunction of the temporomandibular joint and the subsequent formation of myospasm in the muscles of the masticatory system. Possible as initial TMJ dysfunction, as well as the development of pathology from pain spasm [9]. However, most visits to dentists occur at the stage of severe myofascial pain syndrome (MPS) — precisely during the period of intense muscle pain in the maxillofacial region. The leading symptom indicating TMJ is pain, the assessment of which is always complex and ambiguous. The pain is caused by the presence of areas of increased tone (hypertonia) and trigger points in the masticatory muscles. [6, 8]. Trigger points in the masticatory muscles are combined with a focal increase in tone in the muscles of the neck and shoulder girdle, osteochondrosis of the spine [7]. Pain and hypertension in the masticatory muscles affect the nature and volume of movements of the lower jaw, the trajectory of opening and lateral displacement of the mouth.

The purpose of the work

To study the study of age-related changes in the temporomandibular joint and their effect on the formation of pathologies of the maxillary system.

The clinical examination of patients with myofascial pain syndrome (MPS) was carried out according to a specially developed chart scheme, which covers the analysis of the characteristics of existing pain, their location, duration of the disease, identification of factors contributing to the occurrence of pain, as well as previous treatment methods and their effectiveness. Taking into account the goals and objectives of this study, age-related characteristics of osteoarthritis of the temporomandibular joint are highlighted, pain in the joint area, as well as in the neck, temples, and bridge of the nose increases when trying to open the mouth wide, while eating solid food, after a long conversation, due to hypothermia, crunching in the affected joint, periodic spasm in the facial (mandibular) muscles; Difficulties in performing chewing movements, as well as migraines, can sometimes be associated with TMJ. Pain or discomfort in the ear, jaw, temple, and neck on one or both sides. Discomfort can appear suddenly and increase, varying in frequency and intensity, over months and years.

A comprehensive analysis was conducted under the supervision of 235 patients with TMJ diseases without dental anomalies (32 men and 203 women in the age group from 15 to 35 years). The subjects were divided into 3 groups: 1st (63 people) - adolescence; 2nd (102) — adolescence; 3rd (70) - early adulthood. To detect areas with increased muscle tone and determine their soreness, palpation of the following areas was performed: temporal, masticatory, pterygoid (lateral and medial), anatomical structures of the oral cavity, as well as the sternocleidomastoid complex and trapezius muscle. The examination of the condition of the temporomandibular joint was carried out by dynamic palpation: the patient was asked to relax the jaw, after which pressure was applied from front to back on the chin and from bottom to top at the corners of the lower jaw. The assessment included a study of the freedom of movement of the mandibular head both at rest and during active movements, as well as an analysis of the painlessness of these actions, identifying the types of movements that contribute to or reduce pain (tab 1).

JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS
VOLUME 05, ISSUE 01
MOPNTHLY JOURNALS
GERMAN INTERNATIONAL JOURNALS
ISSN NUMBER: 2751-4390
IMPACT FACTOR: 9,08

Table 1

Distribution of patients with TMJ of different age groups by type of pain (in %)

The nature of the pain	Groups of patients			p		
	1-я	2-я	3-я	1 и 2-я	1 и 3-я	2 и 3-я
Aching constants	28,40±6,25	32,60±4,72	15,90±4,05	>0,05	>0,05	<0,05
Aching paroxysms	52,88±6,92	59,70±4,96	26,90±4,92	>0,05	<0,05	<0,05
The shooters	13,19±4,69	6,08±2,42	17,11±4,18	>0,05	>0,05	<0,05
Breaking ones	45,25±6,90	42,43±4,99	25,50±4,85	>0,05	<0,05	<0,05
Pressing	7,55±3,66	12,20±3,30	9,70±3,29	>0,05	>0,05	>0,05
Pulling	28,30±6,25	27,30±4,50	26,80±4,92	>0,05	>0,05	>0,05
Piercing	1,89±1,89	1,01±1,01	0,0±0,0	>0,05	>0,05	>0,05
Daggers	1,89±1,89	1,01±1,01	0,0±0,0	>0,05	>0,05	>0,05
Silly	1,89±1,89	1,01±1,01	0,0±0,0	>0,05	>0,05	>0,05
Pulsating	0,0±0,0	0,0±0,0	6,10±2,66	>0,05	<0,05	<0,05
Radiating	3,77±2,62	3,03±1,73	34,10±5,27	>0,05	<0,05	<0,05
Bursting	0,0±0,0	0,0±0,0	2,40±1,70	>0,05	>0,05	>0,05
In the area of the masticatory muscles:						
fatigue	5,60±3,19	8,08±2,75	12,20±3,31	>0,05	>0,05	>0,05
fatigue	5,60±3,19	3,03±1,73	4,80±2,16	>0,05	>0,05	>0,05
discomfort	11,30±4,39	13,10±3,41	2,40±1,55	>0,05	>0,05	<0,05
unpleasant sensations	13,20±4,69	12,20±3,31	12,20±3,38	>0,05	>0,05	>0,05

In groups 1 and 2, it was not possible to diagnose isolated TMJ in any cases (without clinical manifestations of cervical vertebral dystrophic syndrome, scoliosis, or postural disorders). Neurologists diagnosed the representatives of group 3 with cervical vertebral dystrophic syndrome or clinically significant cervical osteochondrosis: cervicalgia or cervicobrachialgia with a dysfunctional mechanism of damage to the vertebral motor segment with muscular-dystonic manifestations or with the dominance of the dyscirculatory mechanism of damage to the vertebral motor segment, vegetative-irritative.

According to the nature of pain, adolescent and adolescent patients (age groups 1 and 2) did not differ ($p>0.05$). In both groups, "aching" and aching pains were detected more often than in the 3rd group ($p<0.05$), and in the 2nd group— persistent pain ($p<0.05$). In patients of the 3rd group, burning, throbbing pains significantly prevailed, with a wide zone of irradiation in half of the face, head, neck, and parietal region ($p<0.05$). Shooting pains were detected more often in the 3rd age group than in the 2nd ($p<0.05$). In addition to pain, some patients had rapid fatigue and fatigue of the masticatory muscles. Individuals in group 1 were more likely than in group 3 to have unpleasant sensations in the area of the masticatory muscles ($p<0.05$). The pain had extensive and stable localization in the jaws, neck, TMJ, gums, upper arms, shoulders, arm ($p>0.05$),

however, in patients of the 3rd group it was more often concentrated in the temporal region, half of the face, teeth, cheeks, crown, shoulder blade, ear region, gums (tab 2).

Table

Distribution of patients with TMJ of different age groups by pain localization (in %)

Localization of pain	Groups of patients			p		
	1-я	2-я	3-я	1 и 2-я	1 и 3-я	2 и 3-я
Temple	5,60±3,20	8,08±2,75	30,50±5,12	>0,05	<0,05	<0,05
Half of the face	0,0±0,0	3,03±1,73	30,50±4,92	>0,05	<0,05	<0,05
Jaws	100,0±0,0	100,0±0,0	100,0±0,0	>0,05	>0,05	>0,05
Teeth	22,64±5,80	11,11±3,17	23,20±4,69	>0,05	<0,05	<0,05
TMJ	13,20±4,69	24,24±4,32	21,90±4,60	>0,05	>0,05	>0,05
Ear	0,0±0,0	3,03±1,73	7,30±2,89	>0,05	<0,05	>0,05
The darkness	0,0±0,0	2,02±1,42	9,70±0,0	>0,05	<0,05	<0,05
Upper Arm	100,0±0,0	100,0±0,0	100,0±0,0	>0,05	>0,05	>0,05
Neck	71,70±6,25	66,67±4,76	62,20±5,39	>0,05	>0,05	>0,05
Shoulder	52,83±6,92	51,51±5,05	59,70±5,43	>0,05	>0,05	>0,05
The shoulder blade	28,30±6,25	26,26±4,44	46,30±2,83	>0,05	<0,05	<0,05
Arm	32,07±6,47	34,34±4,87	39,0±5,41	>0,05	>0,05	>0,05

The pain-provoking factors in groups 1 and 2 were significantly more often than in groups 3, the use of chewing gum for 5-10 minutes, static load, and significantly less often - extension of the cervical spine, circular movements of the head, stress, warmth, evening time and conversation, and in the 1st more often than in the 3rd in the 2nd ($p<0.05$), extension of the cervical spine (tab 3).

Table 3

Frequency of pain-provoking factors in patients with TMJ of various age groups (in %)

Factors that provoke pain	Groups of patients			p		
	1-я	2-я	3-я	1 и 2-я	1 и 3-я	2 и 3-я
Opening the mouth	28,30±6,25	27,27±4,49	37,80±5,39	>0,05	>0,05	>0,05
Prolonged chewing	22,64±5,80	14,14±3,52	7,30±2,89	>0,05	<0,05	>0,05
Chewing gum 5-10 minutes	22,64±5,80	18,18±3,89	4,90±2,39	>0,05	<0,05	<0,05
Clenching your teeth	11,32±4,39	8,08±2,75	3,60±2,07	>0,05	>0,05	>0,05
Movement of the lower jaw	13,21±4,69	9,09±2,90	4,90±2,39	>0,05	>0,05	>0,05
Static load	37,73±6,72	42,42±4,99	20,70±4,50	>0,05	<0,05	<0,05
Turning your head to the side	16,98±5,21	19,19±3,98	13,40±3,78	>0,05	>0,05	>0,05
Turning the head to the sides	20,75±5,62	19,19±3,98	30,50±5,11	>0,05	>0,05	>0,05
Flexion of the cervical spine	22,64±5,80	16,16±3,72	28,00±4,99	>0,05	>0,05	>0,05
Extension of the cervical spine	13,21±4,69	3,03±1,73	32,90±5,22	>0,05	<0,05	<0,05
Circular head movements	7,55±3,66	6,06±2,41	23,20±4,69	>0,05	<0,05	<0,05
Stress	5,66±3,20	11,11±3,17	35,40±5,31	>0,05	<0,05	<0,05
Cold	3,77±2,64	2,02±1,42	1,20±1,20	>0,05	>0,05	>0,05
Heat	0,0±0,0	0,0±0,0	39,00±5,42	>0,05	<0,05	<0,05
Evening time	3,77±2,64	3,03±1,73	47,60±5,55	>0,05	<0,05	<0,05
Conversation	0,0±0,0	0,0±0,0	4,90±2,39	>0,05	<0,05	<0,05

The results of comparing pain sensations according to the scales of the multidimensional verbal-color pain test in patients with TMJ of different age groups revealed an unreliable difference on all scales and an integral indicator between adolescents and adolescents ($p>0.05$). There were significant differences between the adolescent and adult age groups in 1, 2, 3, 5, 7- There was an insignificant difference on the 4th scale and the integral pain index ($p<0.05$) and an unreliable difference on the 4th scale ($p>0.05$). There were significant differences in age between the adolescent and mature age groups. 1, 3, 4, 5, 7- on the 2nd scale and the integral index of pain ($p<0.05$) and unreliable ($p>0.05$) on the 2nd scale (Table 4).

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ISSN NUMBER: 2751-4390
IMPACT FACTOR: 9,08

Table 4

Comparison of pain symptom results according to multidimensional pain test scales in patients with TMJ of different ages (in %)

Scales	Groups of patients			p		
	1-я	2-я	3-я	1 и 2	1 и 3	2 и 3
1st	3,27 ±0,22	3,20±0,15	4,13±0,19	>0,05	<0,05	<0,05
2nd	3,7 ±0,17	3,89±0,10	4,22±0,15	>0,05	<0,05	>0,05
3rd	2,92 ±0,11	2,91±0,06	3,51±0,13	>0,05	<0,05	<0,05
4th	3,97 ±0,09	3,89±0,06	4,14±0,08	>0,05	>0,05	<0,05
5th	3,82±0,14	3,69±0,09	4,71±0,12	>0,05	<0,05	<0,05
7th	2,16 ±0,30	1,98±0,19	3,34±0,23	>0,05	<0,05	<0,05
Integral indicator	3,32 ±0,09	3,27± 0,06	4,00±0,07	>0,05	<0,05	<0,05

Consequently, in mature patients, compared with those in adolescence and adolescence, pain occurred significantly more often, was more intense, differing in nature, sensory perception and emotional attitude, and was provoked by a large number of factors. Palpation revealed areas of hypertension of various soreness with a trigger in the masticatory muscles, neck muscles, upper arms, shoulder blades, and pain radiating to various parts of the face and neck during palpation. Compared with group 3, foci of painful hypertension in the temporal, masticatory, lateral pterygoid, neck, shoulder, and shoulder blade muscles were significantly more common in groups 1 and 2. Slightly painful foci were palpated more often in the medial pterygoid muscle, neck muscles, and upper arms, while areas of painless hypertension were in the temporal, medial, and lateral pterygoid muscles, and the muscles of the oral cavity floor ($p<0.05$). In patients of the 3rd group, sharply painful hypertones with irradiation prevailed upon palpation in the masticatory, medial and lateral pterygoid muscles, muscles of the floor of the oral cavity, muscles of the neck, upper arms, shoulder blades, slightly painful in the temporal muscle ($p<0.05$).

The tone of the masticatory muscles was always increased, its asymmetry and a decrease in the elasticity of these muscles were revealed. Palpation of the masticatory muscles revealed the following features: in patients of groups 1, 2 and 3 with musculotonic manifestations of osteochondrosis, the muscles of the cervical spine were dense. The most painful part of the muscles turned out to be the abdomen; slow stretching caused a decrease in their tone. Irritation of the hypertonic foci during palpation was always accompanied by pains similar to those described by the patient at the first visit. Hypertension with an active trigger point was found not only on the painful side, but also on the opposite side. In mature adults with vegetatively irritative manifestations of the cervical spine, the abdomen and muscle attachment sites were equally painful. Irritation of hypertones during palpation always provoked pain with an unpleasant vegetative tinge (burning sensation, crawling, etc.), prolonged aftereffect and a wider area of irradiation. In the 3rd age group, pain radiated to the temple, ear, lower jaw, TMJ, occiput, crown, arm significantly more often than in adolescents and adolescents ($p(p<0.05)$. In the

presence of hypertension in the neck muscles, irradiation to the temple, neck, upper arms, and arm was significantly more common ($p<0.05$).

Table 5

Distribution of patients with TMJ of different age groups according to the nature of movements of the mandible (in %

The nature of the movements	Groups of patients			p		
	1-я	2-я	3-я	1 и 2-я	1 и 3-я	2 и 3-я
Type of movement: zigzag stepwise S-shaped	71,70±6,25	75,75±4,33	52,4±5,55	>0,05	<0,05	<0,05
	22,64±5,80	16,16±3,72	39,0±5,45	>0,05	<0,05	<0,05
	5,66±3,20	8,08±2,75	8,6±3,12	>0,05	>0,05	>0,05
Lateral movements of the lower jaw: uniform and uneven	24,53±5,97	19,19±3,98	9,7±3,29	>0,05	<0,05	>0,05
	75,47±5,97	80,8±3,99	90,3±2,99	>0,05	<0,05	>0,05
Mouth opening: limited increased rate	39,62±6,78	37,37±4,89	71,9±4,99	>0,05	<0,05	<0,05
	16,98±5,21	14,14±3,50	4,9±2,40	>0,05	<0,05	<0,05
	43,40±6,87	48,48±5,05	23,2±4,69	>0,05	<0,05	<0,05
The presence of pain when opening the mouth	5,66±3,20	4,04±1,99	6,09±2,66	>0,05	>0,05	>0,05
A click when opening the mouth	24,53±5,97	18,18±3,90	14,6±3,92	>0,05	>0,05	>0,05

All patients had changes in the movements of the lower jaw, with zigzag movements more common in groups 1 and 2, and staggered movements in groups 3 ($p<0.05$). Mouth opening was significantly increased more often in patients of the 1st and 2nd groups and limited in patients of the 3rd. Uneven lateral displacement of the mandible was more common in adults than in adolescents (Table 5).

Thus, the clinical manifestations of TMJ vary depending on the age of patients, which is important to consider when making a diagnosis and choosing treatment tactics. Mature patients often have a high degree of concomitant diseases, which can complicate the clinical situation. Additional pathologies such as osteoarthritis, cervical spine dysfunction, and psychosomatic disorders are often present, which requires an integrative approach to diagnosis and therapy.

In adolescence, the syndrome of pain dysfunction of the temporomandibular joint is most often associated with physiological changes, such as the active growth and development of the maxillary system, as well as increased exposure to stress and emotional fluctuations. In this context, an important aspect is prevention and timely correction at the first signs of dysfunction, which can prevent further development of the disease. Young people, as a rule, show more pronounced emotional reactions to pain, which may be due to the peculiarities of their psychoemotional state and social adaptation. They also have differences in pain perception and interpretation, which can influence the choice of treatment and rehabilitation methods.Thus, understanding the clinical features of temporomandibular joint pain syndrome, depending on the age group, allows doctors to develop more effective diagnostic and treatment strategies, including both drug and non-drug methods such as physiotherapy, psychological support and patient training in self-regulation techniques.

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