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Development and Improvement Of Approaches to The Diagnosis and Treatment Of Inflammatory Diseases Of The Temporomandibular Joint

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Abstract: This study aims to improve diagnostic and treatment approaches for inflammatory diseases of the temporomandibular joint (TMJ), which significantly impact patients' quality of life. A total of 245 patients aged 18-55 and older were clinically examined between 2020 and 2024 to identify the most effective treatment methods. The study used clinical, radiographic, and laboratory evaluations to assess the condition of the articular head and disc. Findings revealed that 70-80% of TMJ cases involved soft tissue pathologies, such as articular disc and ligament dysfunctions, with arthritis and osteoarthritis risk increasing with age. Patients commonly experienced intense headaches, ear pain, limited mouth opening, and joint noises. Treatment involved osteotropic antibiotic injections, analgesics, and enzyme electrophoresis, showing significant improvements in joint mobility and pain reduction. The study highlights the importance of early diagnosis, tailored treatment plans, and a multidisciplinary approach to managing TMJ disorders. Implementing optimized diagnostic techniques and individualized therapy can enhance patient outcomes and prevent disease progression.

Keywords: Pathology, Diseases, Genetic, Diagnostic Criteria, Syndrome, Lower Jaw, Spasm, Disease, Acupuncture

Introduction

The widespread occurrence of temporomandibular joint (TMJ) diseases, especially among middle-aged individuals, along with the often recurrent and extended nature of their progress, which leads to a decrease in the quality of life, highlights the significance of studying this condition. However, the exact extent of this disease remains uncertain, primarily due to inconsistent diagnostic criteria (Arsenina O.I., Popova A.V., Gus A.A., 2019). TMJ diseases encompass a range of conditions known by various names, including arthrosis, arthritis, pain dysfunction syndrome, painful joint dysfunction, musculo-articular dysfunction, myofascial pain syndrome, neuromuscular syndrome, and occlusal-articulatory syndrome. These conditions are characterized by pain in the temporomandibular joint and chewing muscles, as well as clicking sounds (Prozorova N.V., Kirillova A.V., Gilina T.A., 2020). Notably, the prevalence of these diseases increases with age, reaching up to 36% in the elderly. Contributing factors to TMJ osteoarthritis may

include age, genetic predisposition, joint and surrounding muscle abnormalities or disorders, prior joint or lower jaw trauma, and systemic influences. Clinical symptoms of TMJ diseases, particularly osteoarthritis, include joint pain, limited mobility, and distinct joint sounds.

Dental experts describe three stages of this disease (Fonseca, 2017; Wu et al., 2020). The initial stage, lasting up to four years, involves creaking and crunching during TMJ movement. The intermediate stage, spanning six months to a year, involves joint destruction, pain at rest or during activity, limited mouth opening, and grinding sounds. On average, the transition from the initial to the final stage takes 5.5 years (Tarasov et al., 2016; Ulmner et al., 2021; Haack et al., 2020). In summary, the clinical picture of muscle and joint dysfunction includes various pathological symptoms affecting the temporomandibular joint and chewing muscles. Purpose This study was to identify the most rational approach to solving issues of improving methods of treating diseases of the temporomandibular joint.

Methodology

The subjects of this study were dental patients of various age groups with TMJ diseases. During the study, a clinical examination of 245 dental patients aged 18-25, 26-40, 41-55 and over 55 years old with diseases of the temporomandibular joint, who were undergoing outpatient treatment from 2020 to 2024, was conducted. Table 1 presents data on the distribution of patients by gender and age.

Table 1. Distribution by gender and age of patients who took part in the studies

Distribution by gender and age of patients who took part in the studies.							
Group	**Number of patients**	**Floor**		**Age**			
		Men	**Women**	**18-25**	**26-40**	**41-55**	**over55**
Control	135	28	107	58	50	19	8
Research	110	15	95	49	39	19	3
Common	245	17	202	107	89	38	11

Patients in the primary group reported intense, shooting headaches affecting one side of the face and head, often radiating into the neck region. Ear pain, characterized as a non-infectious pathology, was a complaint among 50% of these patients. Sounds resembling grinding, crunching, and clicking were typical in individuals with inflammatory conditions of the temporomandibular joint; these sounds were associated with heightened pain and dizziness. One-third of the patients experienced ear congestion, while 40% reported tinnitus, limited mouth opening, and joint noises described as rustling, friction (crunching), crepitus, or clicking. The control group comprised 135 examined patients, aged 18-25 years and over 55 years. No pathological changes in the temporomandibular joint were detected in any patient within the control group. The study's main approach combined clinical examination results from specific patients across different age groups with logical

conclusions derived from these results. All examined patients underwent clinical and laboratory testing. Radiographic methods assessed the condition of the articular head, articular disc, and their relative positions. A treatment method frequently employed involves injecting osteotropic antibiotics into the joint cavity, supplemented with analgesics. This approach aims to relieve pain, enhance temporomandibular joint trophism and mobility, facilitate solid food intake, and promote increased activity. The treatment spans ten days, succeeded by enzyme electrophoresis. This method will be refined and introduced to practicing dentists.

Result and Discussion

Various pain sensations within the temporomandibular joint arise both from damage to the joint itself and from pathologies in the surrounding tissues. These pains manifest as a disruption of the trophism affecting the joint's cartilaginous surfaces, its bony components, and adjacent structures. Radiographic analysis reveals that, in 70-80% of temporomandibular joint cases, pathological processes are linked to soft tissue pathologies, specifically within the articular disc, intra-articular ligaments, and capsule. The likelihood of arthritis and arthrosis increases with age. However, disproportionate skeletal development may precipitate TMJ osteoarthritis, often termed juvenile or adolescent osteoarthritis, during adolescence (Tsai et al., 2021; Leissner et al., 2021).

Pharmacological intervention involves sedatives, antidepressants, and muscle relaxants. Prescribing these medications based on specific indications mitigates emotional stress and fear, while also alleviating spasms in the masticatory muscles and reducing pain. Furthermore, the management of inflammatory TMJ diseases requires consideration of the disease's etiology, pathogenesis, stage, the patient's unique characteristics, and their current mental state. Given that the progression of specific inflammatory diseases is tied to a "spasm - pain - spasm - pain syndrome" cycle, interrupting this pathological chain is possible by carefully addressing the external factors contributing to its occurrence.

During the initial consultation, providing the patient with comprehensive information about their condition is essential. Emphasis should be placed on the importance of minimizing stressful situations and restricting lower jaw movements, alongside avoiding solid foods. Crucially, dental treatments, rational prosthetics, and selective teeth grinding should be implemented. Acupuncture may also be beneficial. Therapeutic gymnastics and autogenic training can prove helpful, especially during the early stages of the disease. Thermal procedures should precede these therapeutic exercises. Optimizing the diagnosis and treatment of inflammatory diseases affecting the temporomandibular joint (TMJ) requires a tailored approach, selecting the best combination of methods based on the patient's unique characteristics. Scientific literature extensively discusses advancements in diagnosing and treating inflammatory TMJ diseases, highlighting the significance of these issues and the need for practical solutions.

Waldman (2018), in his study of oral cavity and temporomandibular joint disease syndromes, observed that acute arthritis of this joint presents with pain exacerbated by

lower jaw movement, radiating to various parts of the maxillofacial area, with pain lessening at rest. Mouth opening is limited to 0.5-1 cm, and the jaw deviates to the painful side upon opening, potentially accompanied by swelling. Arthrocentesis reveals tissue infiltration near the tragus, where the skin appears taut and does not fold easily. In this case, a prompt and precise treatment selection significantly influences the final outcome. Consequently, discussions surrounding this topic underscore the diverse perspectives among researchers regarding enhancements in the diagnosis and treatment of inflammatory TMJ diseases, which, in turn, shapes the trajectory for future research in this domain.

Conclusion

The diagnosis of inflammatory diseases affecting the temporomandibular joint (TMJ) presents a considerable challenge, primarily due to the necessity for an objective evaluation of the condition's diverse clinical manifestations. Advances in diagnostic and treatment approaches for inflammatory TMJ disorders are now achievable through the application of modern computer diagnostic techniques. These methods facilitate the identification of the disease's onset at a preliminary stage, alongside the implementation of preventive measures aimed at halting the progression of identified pathologies. The patient's unique characteristics, including age and the progression of the condition, ultimately determine the success of diagnosis and treatment. These factors should be paramount when selecting treatment strategies, as the final outcome hinges on the appropriate choice of treatment methods tailored to the patient.

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