

ANALYSIS OF CHRONIC TEMPOROMANDIBULAR DISORDERS BASED ON THE LATEST DIAGNOSTIC CRITERIA

V. Svechtarov¹, S. Nencheva-Svechtarova² and Ts. Uzunov³

¹Department Oral and Maxillofacial Surgery, Faculty of Dental Medicine, Medical University – Sofia

²Center for Integrated Dental Medicine, Faculty of Dental Medicine, Medical University – Sofia

³Department Conservative Dentistry, Faculty of Dental Medicine, Medical University – Sofia

Summary. The objective of this study is to analyze the distribution of the most common diagnoses observed in patients with chronic temporomandibular disorders, based on the new diagnostic criteria (DC/TMD) adopted in 2014. The previous Research Diagnostic Criteria (RDC/TMD) adopted in 1992, consisted of three main groups of eight diagnostic subgroups and is currently transformed into two main groups and twelve subgroups, respectively. All subgroups correspond to the nomenclature of the ICD-10. The new clinical diagnostic indices are also modified. The analysis showed a prevalence of Pain-Related TMD compared with that of intra-articular disorders in ratio 57.89% to 42.10%. In Pain-Related TMD arthralgia was represented in 55% of cases; local myalgia – in 12%, myofascial pain – in 18%, myofascial pain with referral – in 14%, headache attributed to TMD – in 1%. In Intra-articular TMD disc displacement with reduction was found in 23% of the cases, disc displacement with reduction with intermittent locking – in 3%, disc displacement without reduction with limited opening – in 25%, disc displacement without reduction and without limited opening – in 8%. Degenerative diseases were found in 14.28%, and hypermobility and subluxations – in 26.98%. These analyzes differ and can only partly be compared with previous analyzes based on RDC system. The changes in the diagnostic criteria require new clinical studies in order to refine the picture of temporomandibular pathology in accordance with the modern views on the matter.

Key words: *diagnostic criteria, temporomandibular disorders, DC/TMD, pain-related, intra-articular*

INTRODUCTION

Temporomandibular disorders (TMDs) and related myofascial pathology are the most common cause of pain in the maxillofacial area following odontogenic pain [11]. TMDs are also the second most common musculoskeletal condition (after chronic low back pain) resulting in pain and disability, affecting approximately up to 12% of the population [14]. Nearly 5% of the patients have chronic symptoms of pain that is difficult to treat with most of the known methods. These diseases are characterized by various etiology, in contrast to the relative uniformity of the symptoms. The key to the successful treatment of difficult

cases is the precise diagnosis. It is essential for the clinician to have detailed information on the present symptoms (and combinations of them) in order to categorize the disease properly thus allowing the use of clinically proven and effective treatment options [7-13]. The growing interest in temporomandibular pain-related dysfunctions necessitated a global diagnostic standard [1, 2]. The new (2014) evidence-based dual-axis Diagnostic Criteria for TMD (DC/TMD) Axis I protocol includes both a valid screener for detecting any pain-related TMD as well as valid diagnostic criteria for differentiating the most common pain-related TMD (sensitivity ≥ 0.86 , specificity ≥ 0.98); for intra-articular disorder – disc displacement without reduction with limited opening, with sensitivity of 0.80 (0.63, 0.90) and specificity of 0.97 (0.95, 0.98), and excellent inter-examiner reliability ($\kappa \geq 0.85$) [14, 15]. Moreover, Manfredini et al. [3] demonstrated good to excellent correlation between the diagnostic criteria for disc dislocations and magnetic resonance findings. Usumez et al. [6] reached similar conclusions and recommended limitation of magnetic resonance imaging for most of the clinical cases. The DC/TMD Axis I and Axis II protocol is appropriate for use in both clinical and research settings.

AIM OF THE STUDY

The purpose of this study is to analyze the distribution of the diagnoses of chronic temporomandibular disorders in accordance with the DC/TMD.

MATERIAL AND METHODS

This survey included 63 patients –10 men and 53 women, aged 17 to 74 years (average 41.49 ± 13.92). All cases had clinical signs of chronic joint and/or myofascial pain of various etiologies. Chronic disorders were considered those with symptoms of pain in temporomandibular joint and associated muscles which persist or recur for at least three months, and have objectively palpable trigger points. The 12 common TMDs include arthralgia, myalgia, local myalgia, myofascial pain, myofascial pain with referral, four disc displacement disorders, degenerative joint disease, subluxation, and headache attributed to TMD. Diagnoses were based on Axis I of the DC/TMD, including a questionnaire for history, clinical and laboratory findings. The screening survey included 41 questions that assess pain intensity, pain-related disability, psychological distress, jaw functional limitations, and parafunctional behaviors, and a pain drawing is used to assess the locus of pain. Measurements of interincisal distance, lateral deviations, flat and volumetric palpation of the masticatory and cervical muscles and joints, auscultation of the joints during function, panoramic and TM joint radiographs, CT scans and MRI were performed. The clinical diagnostic criteria that were used were as follows [14]:

1. Diagnostic Criteria for the Most Common Pain-Related Temporomandibular Disorders [14]

1.1. **Myalgia (ICD-10 M79.1)** Pain of muscle origin that is affected by jaw movement, function, or parafunction, and replication of this pain occurs with provocation testing of the masticatory muscles.

History: 1. Pain in the jaw, temple, in the ear, or in front of the ear; AND

2. Pain modified with jaw movement, function or parafunction.

Exam: 1. Confirmation of pain location(s) in the temporalis or masseter muscle(s); AND

2. Report of familiar pain in the temporalis or masseter muscle(s) with at least one of the following provocation tests:

a. Palpation of the temporalis or masseter muscle(s); OR

b. Maximum unassisted or assisted opening movement(s).

Types of myalgia as differentiated by provocation testing with palpation:

1.2. **Local myalgia.** Pain of muscle origin as described for myalgia with localization of pain only at the site of palpation when using the myofascial examination protocol [14].

History: 1. Pain in the jaw, temple, in the ear, or in front of the ear; AND

2. Pain modified with jaw movement, function, or parafunction.

Exam: 1. Confirmation of pain location(s) in the temporalis or masseter muscle(s); AND

2. Report of familiar pain with palpation of the temporalis or masseter muscle(s); AND

3. Report of pain localized to the site of palpation.

1.3. **Myofascial pain.** Pain of muscle origin as described for myalgia with pain spreading beyond the site of palpation but within the boundary of the muscle when using the myofascial examination protocol [14].

History: 1. Pain in the jaw, temple, in the ear, or in front of the ear; AND

2. Pain modified with jaw movement, function or parafunction.

Exam: 1. Confirmation of pain location(s) in the temporalis or masseter muscle(s); AND

2. Report of familiar pain with palpation of the temporalis or masseter muscle(s); AND

3. Report of pain spreading beyond the site of palpation but within the boundary of the muscle.

1.4 **Myofascial pain with referral.** Pain of muscle origin as described for myalgia with referral of pain beyond the boundary of the muscle being palpated when using the myofascial examination protocol. Spreading pain may also be present [14].

History: 1. Pain in the jaw, temple, ear, or in front of the ear; AND

2. Pain modified with jaw movement, function, or parafunction.

Exam: 1. Confirmation of pain location(s) in the temporalis or masseter muscle(s); AND

2. Report of familiar pain with palpation of the temporalis or masseter muscle(s); AND

3. Report of pain at a site beyond the boundary of the muscle being palpated.

1.5. **Arthralgia (ICD-10 M26.62)** Pain of joint origin that is affected by jaw movement, function, or parafunction, and replication of this pain occurs with provocation testing of the temporomandibular joint (TMJ) [14].

History: 1. Pain in the jaw, temple, ear, or in front of ear; AND

2. Pain modified with jaw movement, function, or parafunction.

Exam: 1. Confirmation of pain location in the area of the TMJ(s); AND

2. Report of familiar pain in the TMJ with at least one of the following provocation tests:

a. Palpation of the lateral pole or around the lateral pole; OR

b. Maximum unassisted or assisted opening, right or left lateral, or protrusive movement(s).

1.6. **Headache attributed to TMD (ICD-10 G44.89) [14]**

History: 1. Headache of any type in the temple; AND

2. Headache modified with jaw movement, function, or parafunction.

Exam: 1. Confirmation of headache location in the area of the temporalis muscle(s); AND

2. Report of familiar headache in the temple area with at least one of the following provocation tests:

a. Palpation of the temporalis muscle(s); OR

b. Maximum unassisted or assisted opening, right or left lateral, or protrusive movement(s).

“Familiar pain” or “familiar headache” is based on patient report that the pain induced by the specified provocation test(s) has replicated the pain that the patient has experienced in the time frame of interest, which is usually the last 30 days.

2. Diagnostic Criteria for the Most Common Intra-articular Temporomandibular Disorders [14]

2.1. **Disc displacement with reduction (ICD-10 M26.63) [14]**

History: 1. In the last 30 days, any TMJ noise(s) present with jaw movement or function;
OR

2. Patient report of any noise present during the exam.

Exam: Clicking, popping, and/or snapping noise during both opening and closing movements, detected with palpation during at least one of three repetitions of jaw opening and closing movements; OR

1. 2a. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of opening or closing movement(s); AND

2. 2b. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of right or left lateral, or protrusive movement(s).

2.2. *Disc displacement with reduction with intermittent locking* [14]

History: 1a. In the last 30 days, any TMJ noise(s) present with jaw movement or function; OR

1b. Patient report of any noise present during the exam; AND

2. In the last 30 days, jaw locks with limited mouth opening, even for a moment, and then unlocks.

Exam: Clicking, popping, and/or snapping noise detected during both opening and closing movements, detected with palpation during at least one of three repetitions of jaw opening and closing movements; OR

1. 2a. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of opening or closing movement(s); AND

2. 2b. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of right or left lateral, or protrusive movement(s).

2.3. *Disc displacement without reduction with limited opening* [14]

History: 1. Jaw locked so that the mouth would not open all the way; AND

2. Limitation in jaw opening severe enough to limit jaw opening and interfere with ability to eat.

Exam: Maximum assisted opening (passive stretch) movement including vertical incisal overlap < 40 mm.

2.4. *Disc displacement without reduction without limited opening* [14]

History: 1. Jaw locked so that the mouth would not open all the way; AND

2. Limitation in jaw opening severe enough to limit jaw opening and interfere with ability to eat.

Exam: Maximum assisted opening (passive stretch) movement including vertical incisal overlap ≥ 40 mm.

2.5. *Degenerative joint disease (ICD-10 M19.91)* [14]

History: 1. In the last 30 days, any TMJ noise(s) present with jaw movement or function; OR

2. Patient report of any noise present during the exam.

Exam: Crepitus detected with palpation during at least one of the following: opening, closing, right or left lateral, or protrusive movement(s).

2.6. *Subluxation (ICD-10 S03)* [14]

History: 1. In last 30 days, jaw locking or catching in a wide open mouth position, even for a moment, so could not close from the wide-open position; AND

2. Inability to close the mouth from a wide-open position without a self-maneuver.

RESULTS

The data analysis shows that the diagnoses included in the group of the most common pain-related temporomandibular disorders were found alone or in various combinations in 57.89% of all diagnoses. The detailed analysis of percentage distribution within this group showed that arthralgia was presented in 77.77% of patients; myogenic pain symptoms were found in 60.03% of them, and diagnostic subgroups were allocated as follows: local

myalgia – 12%, myofascial pain -18%, myofascial pain with referral –14%, headache attributed to TMD – 1%.

Distribution of the diagnoses according to Diagnostic Critetia within the group of Most Common Pain-Related Temporomandibular Disorders

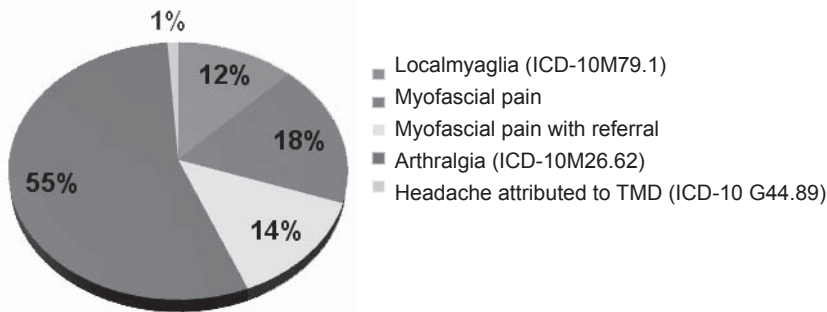


Fig. 1. Distribution of the most common pain-related temporomandibular disorders

Data analysis for the most common pain-related temporomandibular disorders showed that they were present in 42.10% of diagnoses. The majority of them (60.31%) included various disc displacements: disc displacement with reduction in 23%, disc displacement with reduction with intermittent locking – 3%, disc displacement without reduction with limited opening – 25%, disc displacement without reduction without limited opening – 8%. Restrictions on the opening of the mouth of joint origin (disc dislocations combined with disc-induced contractures) were observed in approximately the same percentage of disc dislocations, which do not detect mechanical joint-induced limitation in opening.

Distribution of the diagnoses according to Diagnostic Critetia within the group of Most Common Pain-Related Temporomandibular Disorders

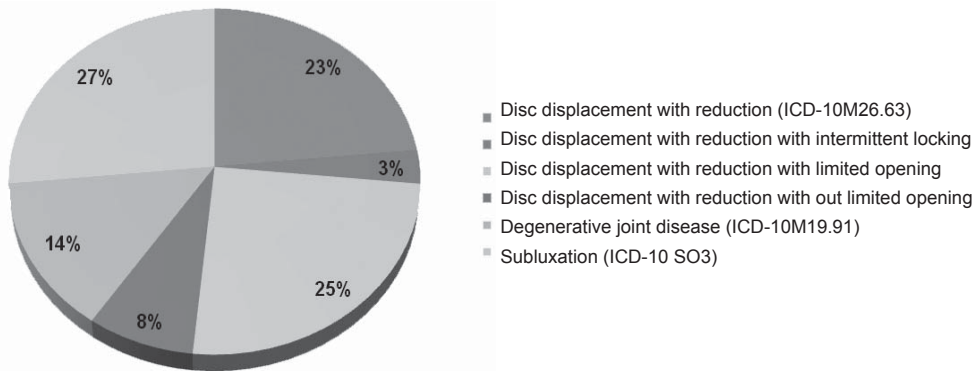


Fig. 2. Distribution of the most common intra-articular temporomandibular disorders

Data analysis for the subgroup of degenerative diseases indicated that they were present in 14.28% of patients with chronic temporomandibular disorders and were associated with organic changes in the condyle and articular surfaces. Degenerative diseases were found in 18.36% of patients with arthralgia and were equally represented – by 23.68% in the myogenic-symptomatic patients, and in the cases of disk dislocations. Subluxations constituted 26.98%

of clinical cases and were found in approximately the same rate as in the group with intra-articular disorders.

The analysis of the distribution of diagnoses showed equal representation between myogenic-related disorders and disk dislocations, while the group of patients with arthralgia, in combination with degenerative inflammatory findings was approximately equal to the sum of the previous two. In eleven patients (17.46%) chronic temporomandibular disorders were manifested as mono-symptomatic processes. In 82% of the patients with chronic pathology overlapping symptoms were found among two, three, or more diagnostic groups. These findings are of particular importance for the application of adequate treatment algorithms and strategy regarding etiopathogenetic and symptomatic therapy.

DISCUSSION

The exact diagnosis of chronic myofascial and temporomandibular pain conditions is often quite a challenge for clinicians that have to unravel the puzzle. The present investigation provided findings that can be useful to create a world-wide database, in accordance with the nature of the DC/TMD classification system. At this stage, the comparability of the data is hampered by the fact that previous studies have been conducted in accordance with RDC/TMD of 1992. A brief comparison with previous criteria in an Italian population shows distribution of diagnoses as follows: 38.2% for muscle disorders, 52.3% for disc displacements, and 52.6% for arthralgia, osteoarthritis, and osteoarthrosis [5]. Manfredini et al. [4] presented data from a systemic review based on twenty-one papers (15 dealing with TMD patient populations and 6 with community samples). The studies on TMD patients accounted for a total of 3,463 subjects (mean age 30.2-39.4 years, female-to-male ratio 3.3), with overall prevalences of 45.3% for group I muscle disorder diagnoses, 41.1% for group II disc displacements, and 30.1% for group III joint disorders. Studies on general populations accounted for a total of 2,491 subjects, with an overall 9.7% prevalence for group I, 11.4% for group II, and 2.6% for group III diagnoses.

Diagnostic criteria require new clinical studies allowing us to refine the picture of TMD in accordance with the latest views on the matter.

CONCLUSIONS

The new diagnostic criteria change the diagram of the percentage distribution of diagnoses in the most common TMDs. The inclusion of the subgroup arthralgia to the group of pain-related TMDs leads to 1.37 times higher prevalence of symptomatology of the entire pain-related group compared with clinical findings typical of intra-articular disorders. Information on the distribution of the most common temporomandibular disorders in chronic patients, and the prevalence of certain subgroups, may be of a great benefit to clinicians in the diagnosis and planning of symptomatic and etiopathogenetic treatment of these complex cases.

REFERENCES

1. Dworkin SF, L LeResche. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications, critique - J Craniomandib Disord Facial Oral Pain, 6, 1992, N1, 301-355.
2. Dworkin SF. Research Diagnostic criteria for Temporomandibular Disorders: current status & future relevance. - J Oral Rehabil, 37, 2010, N1, 734-743.
3. Manfredini, D, L Guarda-Nardini, Agreement between Research Diagnostic Criteria for Temporomandibular Disorders and Magnetic Resonance Diagnoses of Temporomandibular disc displacement in a patient population - Int J Oral Maxillofac Surg, 37, 2008, N7, 612-616

4. Manfredini D, L Guarda-Nardini, E Winocur et al. Research diagnostic criteria for temporomandibular disorders: a systematic review of axis I epidemiologic findings. – *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 112, 2011, N4: 453-462.
5. Manfredini D, G Chiappe, M Bosco. Research diagnostic criteria for temporomandibular disorders (RDC/TMD) axis I diagnoses in an Italian patient population. – *J Oral Rehabil.* 33, 2006, N8, 551-558.
6. Uşümez S, F Oz, E Güray. Comparison of clinical and magnetic resonance imaging diagnoses in patients with TMD history. – *J Oral Rehabil.*, 31, 2004, N1, 52-56.
7. Velly AM, M Gornitsky, P Philippe. Contributing factors to chronic myofascial pain: a case-control study. – *Pain*, 104, 2003, N3, 491-499.
8. Rammelsberg P, L LeResche, S Dworkin, L Mancl. Longitudinal outcome of temporomandibular disorders: a 5-year epidemiologic study of muscle disorders defined by research diagnostic criteria for temporomandibular disorders. – *J Orofac Pain*, 17, 2003, N1, 9-20.
9. American Society of Temporomandibular Joint Surgeons. Guidelines for diagnosis and management of disorders involving the temporomandibular joint and related musculoskeletal structures. – *Cranio*, 21, 2003, N1, 68-76.
10. NIDCR. Study evaluates risk factors for chronic temporomandibular joint and muscle disorders, 2011, Available at: <http://www.nidcr.nih.gov>
11. The American Academy of Orofacial Pain. Orofacial pain: guidelines for assessment, diagnosis and management, 5th ed. Chicago (IL): Quintessence Publishing Co, Inc.; 2013.
12. Anderson G et al. Influence of headache frequency on clinical signs and symptoms of TMD in subjects with temple headache and TMD pain. – *PAIN*, 152, 2011, N4, 765-771
13. Haketa T. Randomized Clinical Trial of Treatment for TMJ Disc Displacement. – *JDR*, 89, 2010, N11, 1259-1263
14. Schiffman E et al. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: Recommendations of the International RDC/TMD Consortium Network and Orofacial Pain Special Interest Group. – *Journal of oral & facial pain and headache*, 28, 2014, N1:6-27
15. Peck C et al. Expanding the taxonomy of the diagnostic criteria for temporomandibular disorders. – *Journal of Oral Rehabilitation*, 41, 2014; N1, 2-23



Corresponding author:

Ts. Uzunov
 Department Oral and Maxillofacial Surgery
 Faculty of Dental Medicine
 Medical University, Sofia
 1 Sv. Georgi Sofiyski St.