

Frequency of occurrence of the pain form of the temporomandibular disorders and gender distribution

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Abstract: Temporomandibular disorders includes abnormalities of the masticatory muscles, temporomandibular joints and the surrounding structures.

The aim of the study was to carry out a retrospective assessment of the frequency of the pain form of TMD based on the analysis of medical records of patients treated at the Prosthodontics Department at Jagiellonian University in Kraków.

Material and Methods: The study included the results of a medical history and a clinical examination of patients, who came for consultation at the Prosthodontics Department at Jagiellonian University in Kraków, due to pain of the masticatory muscles or/and TMJ and painless symptom of TMD like limitation of the jaw movements and joints' sounds. Out of all the analyzed results of the examination of treated patients, a group of patients with a painless and painful TMD was selected.

Results: The study involved the results of a detailed specialized functional examination of 334 patients (210 women and 124 men), ranging from 41 to 68 years. Analysis of the results of clinical examinations conducted in all patients revealed that 161 had the painless form — SG (99 women and 62 men) and 173 patients had the pain form of the TMD — CG (111 women and 62 men). In the CG 104 patients reported mostly pain in the masticatory muscles, while the remaining (69 patients) had a history of pain in one or simultaneously two TMJs.

Conclusion: The analysis of the patients forms allows to conclude that more than half of patients seeking help are patients with the painful form of the TMD and these abnormalities occur more frequently in women than in men.

Key words: temporomandibular disorders, pain, treatment, epidemiology, occurrence and frequency.

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Introduction

Temporomandibular disorders (TMD) according to the American Academy of Orofacial Pain includes abnormalities of the masticatory muscles in the stomatognathic system, temporomandibular joints (TMJs) and the surrounding structures. The term TMD does not include all diseases of the masticatory muscles and joints, like inflammatory or degenerative changes. TMD are often the result of too strong and very long muscle hyperactivities, which are concern with parafunctional activity and excessive work of the jaws and that cause excessive loads within the TMJs [1–6].

Certainly the most common complaint in this group of patients is muscle's pain (slight tenderness to strong pain). Hypertension of the mastication muscles is frequently connected with a parafunction activity like grinding or clenching the teeth, which cause abnormal pressure within the joints. It is often the first response of the muscle tissue to prolonged excessive contraction and is the most common type of acute muscle pain in dental practice. The restriction of opening the mouth is concern with disc dislocation without reduction [1–4]. TMD pain is manifested by variable pain in the preaural region, accompanied by pain or tenderness of the masticatory muscles. The cause of this problem is mostly a long-term overload of soft tissue causally associated with too much muscle tension which lasts for months [1–10].

The aim of the study was to carry out a retrospective assessment of the frequency of occurrence the pain form of the TMD and gender distribution of patients treated at the Prosthodontics Department of Jagiellonian University in Kraków.

Material and Methods

Material: The study included the results of: a medical and dental history and a clinical examination of 334 patients, aged from 41 to 68 years, of both sexes, who came for consultation at the Prosthodontics Department of the Jagiellonian University in Kraków, due to pain of the masticatory muscles or/and temporomandibular joint and painless symptom of TMD like acoustic symptoms within TMJs, limitation or difficulty of the jaws movements. These patients were treated between January 2015 and June 2018. Symptoms of TMD persisted from 1 to 12 months before the beginning of the treatment.

A study group (SG) consists of the clinical results of patients with a painless form of TMD and presence of pain form of the temporomandibular disorders characterized control group (CG).

Criteria of inclusion in the study were: information included in the questionnaire concerning the required age range, no general disease and symptoms of TMD (pain and painless form Ia, IIa, IIb, III according to Research Diagnostic Criteria of Temporomandibular Disorder (RDC/TMD)).

Criteria of exclusion were as follows: the willingness of the patient to resign from the study, the occurrence of a general disease that makes it impossible to continue the study.

During the study, we analyzed information collected in questionnaires belonging to the diagnostic procedure RDC/TMD. Axis I contains the information about functional assessment of the masticatory muscles and TMJs element, spontaneous and provoked pain, the results of the muscles form (tenderness or pain of the muscles) and TMJs palpation, functional manipulation, assessment of the ranges of mandibular movements and joint's sounds. The pain was analyzed in terms of onset, location, duration, characteristics, aggravation and alleviating factors, progression and associated with other symptoms. Discomfort of TMJs and masticatory muscles, as well as radiation of pain, which occurred prior to treatment were analyzed as well. The symptoms concerning TMJs were: the type of sound symptoms (clicking or popping), their frequency and the phase of the movement of lowering and lifting the jaw during which they occurred, occurrence of the tension type headache or back pain. Axis II include of a medical history intensity of muscle or joints pain in various situation, headache frequency, injuries of a head, activities which were limit because of the pain and previous treatment [1, 2, 6, 10]. Through a medical interview, detailed information about the current general health condition was revealed (including information about chronic and hereditary diseases) (Table 1).

Table 1. The prevalence of selected TMD symptoms in males and females in SG.

Type of pain	Group FEMALES N = 111	Group MALES N = 62	Chi2 test; p-value
	n (%)	n (%)	
Spontaneous masticatory muscle pain	73 (65.7)	48 (77.4)	Chi2(1) = 2.57; p = 0.109
Pain of the TMJs triggered by palpation	20 (18)	13 (20.9)	Chi2(1) = 0.22; p = 0.636
Pain associated with lower jaw movements	28 (25.2)	17 (27.4)	Chi2(1) = 0.10; p = 0.750
Radiation of pain	18 (16.2)	15 (24.2)	Chi2(1) = 1.64; p = 0.200

* TMD — Temporomandibular disorders

Due to an etiological factor, very important information associated with emotional tension and stress as well as sleep disturbances in relation to other pain complaints were verified [5–12].

Statistical analysis. In order to assess if there are any differences between men and women in terms of selected TMD symptoms' prevalence, the frequency and independence analyses using *chi*-squared tests were performed and odds ratios with confidence intervals calculated as well. The software used was SPSS v. 26.0 (IBM, USA), *p*-values lower than 0.05 were deemed statistically significant. There were comparisons made between TMD-pain form group and TMD-pain free group.

The percentage of patients, in whom the specified symptom occurred was compared between genders. Additionally the analysis took into account patients belong to SG and CG. For the analysis the following symptoms were selected: masticatory muscles pain, limited opening of the lower jaw, joints' sounds, difficulty in chewing, additionally headache with TMD.

The research obtained approval from the Ethics Committee of the Jagiellonian University: 1072.6120.57.2018 dated 20-th April 2018. Clinical Trials Gov ID: NCT03736408.

Results

The study involved the results of a clinical examination of 334 patients (210 women and 124 men), ranging in age from 41 to 68 years. Analysis of the results of clinical examinations conducted in all patients revealed that 161 had the painless form — SG (99 women and 62 men) and 173 patients had the pain form of the TMD — CG (111 women and 62 men). In the CG 104 patients reported mostly pain in the masticatory muscles, while the remaining (69 patients) had a history of pain in one or simultaneously two of the temporomandibular joints.

From the medical point of view, it is important what kind of joint's problem was reported by the patient. The result of clinical analysis revealed that 43 patients among all subjects came to a doctor due to a dislocation of a disc without reduction, recognized during an examination, and 57 of that group had a problem caused by a dislocation of a disc with reduction. In Table 1 characteristics of pain types are included in connection with Pearson's *chi* squared results and *p*-values.

We observed that joint sounds as a symptom of pain form of TMD occurred significantly more often in men (71.0%) than in women (53.3%). The strength of this association, as assessed by *phi* coefficient was weak.

On the other hand, 32.3% of men enrolled in the study with pain form of TMD. This percentage was significantly higher than in women (17.1%). There appeared to be a weak association between gender and tinnitus, as could be seen from the value of *phi* coefficient.

The prevalence of other symptoms selected for the analysis (masticatory muscles pain, limited opening of the lower jaw, difficulty in chewing, headache) was similar

both in men and women. There were no statistically significant differences in terms of their prevalence between genders.

In the Tables 2 and 3 there are collected results of statistical analysis involving calculated Odds Ratios values for SG and CG with confidence intervals reported as well. Our results showed that pain characteristics (location of pain symptoms) is similar in females and males. Additionally in females group the presence of pain increased risk for headaches presence almost twice. Presence of pain in male group was connected with higher risk for subjective feeling of increased tension in muscles. In male group complaining about difficulty on chewing was a significantly lower incidence significantly rarer than in female group.

Table 2. The prevalence of selected TMD symptoms in females.

Symptoms	Group PAIN N = 111	Group PAIN FREE N = 99	OR (95%CI)*
	n (%)	n (%)	
Joints sounds popping and clicking	59 (53.2)	53 (53.5)	0.79 (0.45–1.39)
Limited opening of the lower jaw	15 (13.5)	10 (10.1)	1.39 (0.59–3.25)
Difficulty on chewing	38 (34.2)	39 (39.3)	0.8 (0.45–1.41)
Headaches	29 (26.1)	14 (14.1)	2.15 (1.06–4.35)
Subjective feeling of increased tension in muscles	78 (70.3)	80 (80.8)	0.56 (0.29–1.07)
Limited lateral mandibular movements	15 (13.5)	10 (10.1)	1.39 (0.59–3.26)
Mandibular deviation during opening	21 (18.9)	15 (15.2)	1.31 (0.63–2.7)
Occlusion parafunctions	82 (73.9)	86 (86.9)	0.43 (0.21–0.88)

* OR — Odds Ratio; 95%CI = 95% confidence interval

** TMD — Temporomandibular disorders

Table 3. The prevalence of selected TMD symptoms in males.

Symptoms	Group PAIN N = 62	Group PAIN FREE N = 62	OR (95%CI)*
	n (%)	n (%)	
Joints sounds popping and clicking	40 (64.5)	44 (71.0)	0.74 (0.35–1.58)
Limited opening of the lower jaw	11 (17.7)	7 (11.3)	1.69 (0.61–4.71)
Difficulty on chewing	14 (22.6)	28 (45.2)	0.35 (0.16–0.77)
Headaches	18 (29)	7 (11.3)	3.21 (1.23–8.38)

Table 3. Cont.

Symptoms	Group PAIN N = 62	Group PAIN FREE N = 62	OR (95%CI)*
	n (%)	n (%)	
Subjective feeling of increased tension in muscles	37 (59.7)	26 (41.9)	2.04 (1.01–4.19)
Limited lateral mandibular movements	11 (17.7)	7 (11.3)	1.69 (0.61–4.71)
Mandibular deviation during opening	15 (24.2)	7 (11.3)	2.51 (0.94–6.67)
Occlusion parafunctions	48 (77.4)	45 (72.6)	1.3 (0.57–2.93)

* OR — Odds Ratio; 95%CI = 95% confidence interval

** TMD — Temporomandibular disorders

Discussion

The stomatognathic system is a very important part of the body, which plays a significant role in chewing, yawning, swallowing and talking as well as breathing. The pain and painless forms of TMD usually significantly impair normal physiological functions of the stomatognathic system, including professional duties (speaking) as well as the ingestion and chewing of food. Epidemiological data is concerning, because the number of patients with the painful form of masticatory dysfunction has been increasing for many years and the age of patients seeking medical help due to difficulties in chewing or the pain of muscles or TMJs is decreasing [1–3, 6, 10–12].

TMD — as evidenced by WHO reports — constitute the third most frequent dental disease of a social nature. Contemporary reports indicate that about 50% of the population report at least one symptom of this dysfunction. Their type depends on social, genetic and in predominance psychoemotional factors. Important etiological factors include chronic psychoemotional tension which, through the activity of the limbic system and the gamma loop leads to a significant increase in the activity of masticatory muscles, and thus leads to an overload of the internal structures of TMJs. This is directly related to intense clenching or grinding of teeth [1, 2, 10]. High parafunctional activity occurring in both women and men, in both of the groups (82 women and 48 men in SG and 86 women and 45 men in CG) attracts attention in the analyzed results of functional tests. Parafunctional activity directly contributes to excessive, prolonged and pathological muscle activity, which is the cause of tooth damage (pathological teeth abrasion, inadequate to age, enamel cracks, injuries of teeth and prosthetic restorations), tension headaches or pain around the shoulder girdle [1].

Most functional activity consists of well controlled and rhythmic contractions and relaxations of the muscles involved in the physiological function of the jaw. Parafunctional activity, by contrast, often results in sustained muscle contraction over long periods. This type of isometric activity inhibits normal blood flow within muscle tissues [1, 3]. Hirai *et al.* [13] have assessed night-time bruxism among volunteers, and the results of their research indicate a high activity of pathological habits in all subjects.

Based on data from literature and the analyzed data we can conclude that TMDs occur more frequently in women than in men. Methods of treating masticatory dysfunction have been the subject of many scientific studies, but so far no clearly defined method of treating this painful disease entity, ie. the pain forms of functional disorders, have been developed [1, 3, 6, 10, 13–15].

The results of the conducted research indicate that, out of 320 patients, as many as 173 attended for prosthetic treatment due to the pain form of the TMD, which constitutes 54.07% of all the analyzed research results. Such a significant share of patients with the pain form indicates poor and inadequate prophylaxis of these diseases. Most often, patients report when they already have an advanced form of the dysfunction (restricted jaw opening, acoustic symptoms in the TMJs or difficult chewing of food, muscle and/or TMJ pain), having earlier sought help from doctors of other specialties. It can be concluded that the awareness of risk factors for the occurrence of dysfunctions or etiological factors is low, due to the increasing number of patients reporting chronic facial pain, which prompts the patients to seek help from laryngologists, neurologists or orthopedists, not dentists [1, 3, 11–16].

Research results of Fredricson *et al.* [17] indicate the possibility of predicting an increased incidence of TMD in patients treated for pneumonia, asthma, tension headaches, general hypermobility of joints and autoimmune disorders. Glaros *et al.*, on the other hand [18] have examined the effect of muscle activity of the masseter muscles on pain occurring within TMJs and mastication muscles concern with headache occurrence. Parafunctional activity is really very harmful habit [19, 20]. This indicates the need for significantly more effective prophylactic measures and work aimed at raising patients' awareness of etiological factors and factors creating favorable conditions for the development of TMD. This disease impairs physiological functions of the stomatognathic system, significantly affecting patient's activity in professional and social life.

Conclusion

The analysis of the patients forms allows to conclude that more than half of patients seeking help due to TMD are patients with the painful form of the TMD. Moreover, TMDs occur more frequently in women than in men.

Statement of contribution

The manuscript has been read and approved by all authors, and all the authors agreed to the submission of the manuscript to The Editor.

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Conflict of interest

None declared.

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