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The Prevalence of Clinical Diagnostic Groups in Patients with Temporomandibular Disorders

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ABSTRACT: The aim of this study was to observe the prevalence of diagnostic groups of temporomandibular disorders (TMD) in patients who were referred or sought treatment for TMD and/or orofacial pain in a private clinic. The clinical records of 357 patients were evaluated and selected based on inclusion/exclusion criteria; the mean age was 32 years. A clinical examination was performed and the diagnosis was based on the American Academy of Orofacial Pain criteria. Results showed that 86.8% of patients were women and 93.3% of the patients presented more than one diagnosis. The most frequent chief complaint (n=216, χ^2= 30.68, p=0.001) and total diagnosis realized (n= 748, χ^2=14.14, p=0.001) were muscle related. We concluded that women seek treatment for dysfunction/disorders of orofacial structures more than men do; patients seeking specialized treatment have more than one diagnosis and muscle dysfunction is more prevalent than intra-articular disorders.

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The term temporomandibular disorder (TMD) adopted by the American Dental Association[1] and accepted by the American Academy of Orofacial Pain (AAOP)[2] includes all disorders involving the masticatory system, being defined, in a more comprehensive view, "as a collective term embracing a number of clinical problems that involve the masticatory muscles, the temporomandibular joint (TMJ) and associated structures, or both."

In a more detailed version, the term temporomandibular disorders (TMD) refers to a group of disorders characterized by: pain in the periauricular area, in the temporomandibular joint (TMJ) or in the muscles of mastication; deviations or restriction in mandibular range of motion and TMJ noises (sounds) during mandibular function.[1,2] Aside from the pain, mandibular disorder, and articular sounds, some clinical factors associated with this disorder include pain resulting from the function or palpation of the masticatory muscles and abnormal relationship between the static and dynamic occlusal relationship.[3]

Signs and symptoms of TMD are common. Epidemiological studies suggest that 50% to 60% of the general population presents at least one sign or symptom of a functional disorder of the masticatory system.[4]

Fillingim[5] reported that the general adult population show several conditions of TMD with a prevalence ranging from 3.7% to 12%. The male-to-female ratio varies from 1.2 to 2.6, with an average of two, indicating gender differences in the longitudinal course of TMD.[5,6] The highest prevalence of TMD seems to occur in individuals aged between 25-44 years, decreasing with age.[5] Greene[7] emphasized that the incidence of TMD increases during the teenage years, a period where most of the patients are submitted to orthodontics treatment, being sometimes wrongly interpreted as a cause and effect relationship.

In general, signs and symptoms of TMD can be grouped according to affected structures: articular dysfunction or intracapsular TMD, when it directly affects the TMJ and masticatory muscle disorders or extracapsular TMD, when it involves other components of the masticatory system, mainly the masticatory muscles.[2,4] These conditions are of significant concern to the clinician because the pain and dysfunction are common complaints in clinical practice.[8]

Currently, there is a lack of data available in the literature concerning the frequency of different TMD diagnostic groups in patients. The present study was carried out to observe the prevalence of these diagnostic groups in a population of patients referred for diagnosis or who sought diagnosis and/or specific treatment for orofacial pain and TMD.

Materials and Methods

The current study was carried out after being evaluated and approved by the Human and Animal Medical Research Ethical Committee at the Clinical Hospital of the Federal University of Goiás Medical School.

The sample used in the study was selected from a population of consecutive patients referred to an office or who were seeking treatment in a private clinic specializing in diagnosis and treatment of TMD and orofacial pain in Goiânia, Goiás, Brazil. The patients were clinically evaluated and diagnosed from January 2000 to December 2003 by two professionals trained and calibrated at the Orofacial Pain Center of the University of Kentucky College of Dentistry.

During the initial visit, all patients filled out a standardized questionnaire, the same one used by the Orofacial Pain Center at the University of Kentucky, having already been clinically evaluated. Data regarding previous medical history and physical exams were collected. Complementary clinical examinations were done when necessary.

The inclusion criteria used in this study follows: a. patients with signs and symptoms of orofacial pain and TMD (AAOP diagnostic criteria); b. patients with complete clinical records; and c. patients who chose to participate as volunteers in this study (patients who signed an informed consent).

The exclusion criteria for the study follows: a. patients with odontogenic pain (extensive cavities, pulpitis) or other orofacial pains, such as neuropathic pain, headaches and/or only atypical facial pain; b. patients with a diagnosis of rheumatoid arthritis, fibromyalgia or other systemic diseases which might affect the stomatognathic system; c. fully edentulous patients with or without maxillar and mandibular full prosthesis; d. incomplete clinical records; e. patients with a inconclusive diagnosis; or f. patients who did not agree to participate as volunteers in the study.

The diagnostic criteria applied in this research were based on those of the American Academy of Orofacial Pain (AAOP)[2,9]: a. masticatory muscle disorders (local masticatory muscle pain, masticatory myofascial pain, protective co-contraction, myospasm and tendinitis); b. articular disorders (disk displacement with reduction, disk displacement without reduction and subluxation); c. inflammatory temporomandibular joint disorders (synovitis/capsulitis); d. noninflammatory temporomandibular joint disorders (primary and secondary osteoarthritis); e. cervical muscles disorders (local cervical pain, cervical myofascial pain); f. bruxism.

The diagnosis of articular disorders was made based on clinical findings and previous clinical history reported by the patients, as well as conventional radiography when necessary—panoramic radiography edge-to-edge and TMJ images. Magnetic resonance images (MRI) of the TMJ were requested for patients with persistent pain, significant limitation of mouth opening (<30 mm) and suspicion of degenerative joint disease (crepitation).

Although bruxism is a contributor and sometimes might trigger TMD, during the collection of data, it was considered as a diagnostic group in cases in which patients experienced it as a chief complaint.

Considering that most of the patients showed more than one diagnosis, these were subdivided in diagnostic categories named: main diagnosis, diagnosis 2, diagnosis 3, diagnosis 4, and diagnosis 5. The main diagnosis was based on the chief complaint reported by the patient, while the rest of the diagnoses were based on secondary complaints and clinical findings recorded during the first visit and complementary tests.

Patients who had primary headaches (i.e., tension-type headache) as the only diagnosis were excluded from the present study. The same rule was applied to some patients who had migraine and neuropathic pain. However, patients with primary headaches caused by TMD or trig-

gered by a muscle function and/or joint disorder were included in the sample, but the headache was not registered in the clinical data.

Patients with an incomplete record and presenting acute pain, which prevented them from being physically examined during their clinical evaluation, were also excluded.

Data were collected from patients' clinical records at their first office visit, mentioned previously, and then included in a database, which was specifically designed for this study in the Microsoft Access for Windows (Microsoft Office 2000 Premium) program. These data were statistically analyzed and compared using the SPSS for Windows 11.0.0 Standard Version (LEAD Technologies, Inc.) program.

Results

The initial population was comprised of 505 patients. A hundred and forty-eight patients (148) were excluded, 121 females (81.8%) and 27 males (18.2%). The sample selected for this research (n= 357) included 310 females (86.8%) and 47 males (13.2%), with a mean age of 32±11 years, ranging in age from 11 to 70 years.

In the analyzed sample, only 24 patients (6.7%) had one diagnosis. Along with the the main diagnosis, 303 patients (93.3%) had at least one more problem diagnosed (Main diagnosis + Diagnosis 2). Forty-nine (49) patients (13.7%) showed five problems simultaneously diagnosed.

Table 1 illustrates the frequency of groups diagnosed as Main Diagnosis. A significant difference was found in the prevalence of patients with muscle disorders as chief complaint (n=216) in comparison to those with articular disorders (n= 141) (χ^2 =30.68; p=0.001).

Table 2 shows the prevalence of each diagnosis made in the total sample of patients, regardless of the sequence in which it was made (whether Main Diagnosis, Diagnosis 2, 3, 4, or 5). One thousand one hundred fifty-six diagnoses (n=1156) were made in 357 patients and a significant difference (χ^2 =14.14; p=0.010) was found when the prevalence of muscle disorders (n=748) was compared to the prevalence of articular disorders (n=408).

Discussion

For some time now, the literature has suggested a higher frequency of females seeking treatment and a higher probability of women having TMD.[5,6,10] Several factors might contribute to the difference in gender in the increased prevalence and impact of TMD and orofacial pain in women, which makes the female population seek treatment more often than male patients, including, hormonal factors (e.g., ovarian hormones); psychosocial

Table 1
Prevalence of Patients According to the Main Diagnostic Group (n=357)

Disorder type	Diagnostic group	No. of patients	%
Muscle-related disorders (n=216)	Local muscle pain	88	24.6
	Cervical myofascial pain	37	14.8
	Masticatory myofascial pain	37	10.4
	Tendinitis	19	5.3
	Myospasm	6	1.7
	Bruxism	5	1.4
	Local cervical pain	5	1.4
	Protective co-contraction	3	0.8
Articular disorders (n=141)	Capsulitis/snynovitis	75	21.0
	Disk displacement with reduction	36	10.1
	Disk displacement w/o reduction	15	4.2
	Primary osteoarthritis	9	2.5
	Secondary osteoarthritis	3	0.8
	Subluxation	3	0.8

Table 2
Prevalence of Patients According to the Type of Diagnosis Made
(n=1156)

Disorder type	Diagnostic group	No. of patients	%
Muscle-related disorders (n=748)	Local muscle pain	235	65.8
	Cervical myofascial pain	156	43.7
	Local cervical pain	112	31.4
	Tendinitis	92	25.8
	Masticatory myofascial pain	86	24.1
	Bruxism	43	12.0
	Myospasm	13	3.6
	Protective co-contraction	11	3.1
Articular disorders (408)	Capsulitis/snynovitis	188	52.7
	Disk displacement with reduction	128	35.9
	Primary osteoarthritis	34	9.5
	Disk displacement w/o reduction	32	9.0
	Secondary osteoarthritis	17	4.8
	Subluxation	9	2.5

factors (depression and anxiety are more prevalent among females than males in the general population, and are associated with an increased pain and other physical symptoms); gender differences in pain perception and central pain modulation (disturbances in the central nervous system regulation can contribute to the development and maintenance of TMD); and social factors such as family history (for instance, when parents experience pain or TMD after discovering their child has a health problem). Also, female patients with acute TMD are more likely to show a persistent pain for a period of six months when compared to males, suggesting that gender is considered a risk factor for the development of chronic TMD. These are common pain conditions associated with a greater demand in treatment among women.[5,6]

The results of the present study with regard to the age and gender of the individuals studied agree with the literature, indicating that the highest prevalence of TMD affects patients between the ages of 25 to 34 years and decreases with advancing age,[5] and that a higher proportion of women[5,10] (86.8%) seek treatment in comparison to men.

The literature shows very little data on the prevalence of different diagnostic groups of TMD in populations of patients. An important result of this study was the high frequency (93.3%) of patients with more than one diagnosed symptom. Therefore, it can be considered that most of the patients experienced not only a muscle dysfunction, for instance, but also articular disorders, inflammatory TMD disorders and/or cervical muscle disorders affecting them at the same time.

Based on this finding, two hypotheses are proposed. First, several patients who sought treatment or who were referred for a specific treatment, only decided after several attempts at previous treatment, with no significant outcome, probably because of a lack of accurate diagnosis. According to Okeson,[11] "diagnosis is by far the most difficult aspect of managing a patient's pain symptom" and "in fact, the majority of treatment failures arise directly from misdiagnoses." Second, patients with chronic muscle dysfunction associated to long-term parafunctional habits, particularly clenching, can develop secondary organic changes in the TMJ. Patients with primary TMJ pathology frequently develop secondary muscle symptoms caused by protective splinting of the jaws.[8] A deep pain produced by local muscle soreness may result in a protective co-contraction, which can produce more pain in the muscle, etc., creating a *cyclic muscle pain*. All practitioners need to be aware of the complications that might arise during diagnosis and treatment.[4,11] The literature clearly shows the multi-factorial aspect of TMD and the fact that one symptom may trigger the other.

Because most of the patients in the current study had more than one diagnosis, it was difficult to compare the results with the findings of papers published in the pre-

sent literature, in which patients were distributed in well-defined specific TMD diagnostic groups, i.e., only groups of patients showing disk dislocation with reduction or only groups of patients with myalgia (local muscle pain).[12-16]

Since the only reference in the current study was the main diagnosis (based on the primary complaint reported by the patient), it is easily noticeable that the main clinical complaint that leads an individual to seek treatment is related to muscle pain and secondly, inflammatory pain, specifically in the TMJ, such as capsulitis and synovitis. **Table 1** illustrates this observation.

When evaluating the frequency of each diagnosis made in the total sample of patients, regardless of the sequence in which they were made (**Table 2**), it can be noted that 65.8% of the patients examined presented local muscle pain in one or more muscles of the masticatory system, regardless of whether it was the main complaint or a symptom found during the clinical exam. Secondly, capsulitis and synovitis were diagnosed in approximately half of the patients who sought specialized treatment. Cervical myofascial pain was the third most frequent diagnosis, followed by disk displacement with reduction, local cervical pain, tendonitis, and masticatory myofascial pain.

It is believed that the high prevalence of capsulitis/synovitis and myofascial-type pain of the head and neck might be explained by the fact that these disorders, in general, are not perceived as a common cause of persistent pain or as a diagnosis. The patient can show additional signs and symptoms, concurrent pathological conditions, and behavioral and psychosocial symptoms that can cause confusion in the diagnosis.[8,17]

Several characteristics of myofascial pain may be present in many painful dysfunctions. For instance, trigger points might develop in association with articular pathologies in the form of disk disorders, osteoarthritis, and subluxation.[8,17] Similarly, capsulitis and synovitis cause deep and continuous pain and can even result in secondary excitatory effects simulating the previously mentioned pain, excessive sensitivity to palpation, or increased protective co-contraction.[4] It can also cause localized muscle pain if it is continuous.[4] As previously seen, the presence of simultaneous symptoms was a common finding in most of the patients included in the present study, and these results are comparable with those of Laskin[8] and Fricton.[17]

When evaluating the number of diagnoses made in the total sample, the findings of this study are consistent with the results found by Ribeiro, et al.,[18] concerning the prevalence of individuals with disk displacement (with or without reduction) and TMJ degenerative joint disease (osteoarthritis) and the ones found by Fricton[17] regarding the prevalence of masticatory myofascial pain. However, the results did not agree with the studies made by Celic and Jerolimov,[19] who found low frequencies of myalgia associated or not to disk displacement with reduction.

Although the present investigation did not use a control group, similar findings to previous studies can be observed, in which women, aged 25-40 years, showed the highest prevalence of TMD, having more muscle pain than articular disorders.

Despite the difficulties and deficiencies found when performing clinical research, more clinical investigations using proper methodologies are required to further understand orofacial pain and TMD, in order to provide a better diagnosis for patients affected by these symptoms.

Conclusions

Based on the methodology used, the results of the present study suggest that:

- The percentage of women (86.8%) seeking treatment for the orofacial structures disorders and dysfunctions is higher than in men;
- Most of the patients (93.3%) seeking specialized treatment shows more than one diagnosis related to disorders or dysfunctions of orofacial structures;
- Muscle dysfunctions are more prevalent than articular disorders;
- The most prevalent disorders are: local pain in the masticatory muscles, capsulitis/synovitis, cervical myofascial pain, disk displacement with reduction and local cervical pain, among other diagnosed symptoms.

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