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ARTICLE

Temporo-mandibular disorders are an important comorbidity of migraine and may be clinically difficult to distinguish them from tension-type headache

Desordens temporomandibulares são comorbidade importante da migrânea e podem ser clinicamente difíceis de distinguir da cefaleia tipo tensional

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ABSTRACT

Clinical differentiation between the primary headaches and temporomandibular disorders (TMD) can be challenging. **Objectives**: To investigate the relationship between TMD and primary headaches by conducting face to face assessments in patients from an orofacial pain clinic and a headache tertiary center. **Method**: Sample consists of 289 individuals consecutively identified at a headache center and 78 individuals seen in an orofacial pain clinic because of symptoms suggestive of TMD. **Results**: Migraine was diagnosed in 79.8% of headache sufferers, in headache tertiary center, and 25.6% of those in orofacial pain clinic ($p<0.001$). Tension-type headache was present in 20.4% and 46.1%, while the TMD painful occurred in 48.1% and 70.5% respectively ($p<0.001$). **Conclusion**: TMD is an important comorbidity of migraine and difficult to distinguish clinically from tension-type headache, and this headache was more frequent in the dental center than at the medical center.

Keywords: primary headache, temporomandibular disorders, migraine.

RESUMO

A diferenciação clínica entre as cefaleias primárias e as disfunções temporomandibulares (DTM) pode ser desafiadora. **Objetivos:** Investigar a relação entre DTM e cefaleias primárias conduzindo uma avaliação face a face entre pacientes de um centro de dor orofacial e de um centro terciário de cefaleia. **Método:** A amostra consistiu de 289 indivíduos avaliados consecutivamente em um centro terciário de cefaleia e 78 indivíduos de uma clínica orofacial. **Resultados:** A migrânea foi diagnosticada em 79,8% dos pacientes do centro de cefaleia e 25,6% dos pacientes do centro de dor orofacial. A cefaleia do tipo tensional esteve presente em 20,4% e 46,1%, enquanto as DTM dolorosas ocorreram em 48,1% e 70,5% respectivamente ($p<0,001$). **Conclusão:** DTM é uma comorbidade importante da migrânea e difícil de distinguir clinicamente da cefaleia do tipo tensional, tanto que esta cefaleia foi mais frequente no centro odontológico do que no centro médico.

Palavras-chave: cefaleia primaria, desordens temporomandibular, migrânea.

Headache is a frequent cause of medical consultation at all levels of care. In the general population, headaches affect nearly 50% of the subjects[1]. In Brazil, migraine affects around 10% of the adults, while tension-type headache (TTH)

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happens in other 38%[1,2]. In a face-to-face study in which the entire population of a city in Brazil was investigated, one-year prevalence of headache was 65.4%[3], and distribution of headache types were in alignment with other studies from Brazil[4,5]. Headaches are a frequent cause of consultation in the specialty care[6,2].

The temporomandibular disorders (TMD) is a collective term that includes many clinic problems that involve the masticatory muscles, the temporomandibular joint (TMJ) and associated structures or both. The most common symptom is pain, and it can be aggravated by chewing or other jaw function, and can also restrict the function related to the associated structures, and articular sounds are frequent. The prevalence of these symptoms can affect until 75% of the adult population and it is estimated that 40% to 60% of general population present any signs or symptoms of TMD[7]. Although the prevalence of TMD varies widely, in the Brazilian general population over 40% of subjects have at least one TMD symptom, and 10% have three or more[8]. TMJ pain affects from 5-16% of the general population and, as for migraine headaches, women are disproportionally affected[8-10].

The myofascial pain (MP) is one of the most common TMD and it consists in a painful condition characterized by pain in local areas in the jaw, temples, face, pre auricular area, or inside the ear with the presence of trigger-points (TP). These (TP) can produce a characteristic pattern of irradiated pain or autonomic symptoms when stimulated[7].

There are many diagnostic systems for TMD of which MP is a part. The Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) was created to provide classification criteria for the condition that are universally accepted and validated. A diagnosis of MP by the RDC/TMD requires pain to be reported by the subject in response to palpation of three or more sites of the masticatory muscles[11].

Specific primary headache syndromes, in special migraine, and TMD are comorbid, as demonstrated by clinic-based and population studies. Additionally, TMD is a risk factor for increased headache frequency[10,12-20]. Nonetheless, as with many of the identified risk factors for increased migraine frequency, most of the studies diagnosed both migraine and TMD based on self-reported symptoms or on questionnaires. Accordingly, the aim of this study was to investigate the relationship between TMD and headache syndromes by conducting rigorous face to face assessments in patients from an orofacial pain clinic and a headache tertiary center.

METHOD

Participants of this study consist of 289 individuals consecutively identified at the Headache Specialty Center at *Universidade Federal de Minas Gerais* (Belo Horizonte, Brazil), as well as 78 individuals who sought care with complaints suggestive of TMD at the Odontologic Training and Specializing Center (Belo Horizonte, Brazil). All patients were independently assessed by neurologists with experience in headache medicine. Headaches were diagnosed according to the Second Edition of the International Classification of Headache Disorders (ICHD-2)[21] after a structured interview and clinical examination. Headaches of interest included migraine, TTH, chronic daily headache (CDH), and medication overuse headache, which was diagnosed only after detoxification, as per the ICHD-2.

Oral and muscular assessments were respectively conducted by dentists and physical therapists. Trigger points, threshold for pain and the temporomandibular joint were rigorously assessed. TMD was assessed using the RDC/TMD[22] through an interview and, subsequently, a physical examination. The RDC/TMD consists of a dual-axis approach (Axis I and II), composed by a questionnaire and a physical examination made by dentists and physioterapists previously calibrated by a gold standart examinator, who provided an overview of all procedures and helped them to practice on each other and other subjects recording and comparing the results from the same subjects evaluated according to the International RDC/TMD Consortium specifications. Additionally, the head and neck muscles were examined and pain sensitivity to 2.0 kg straight pressure was assessed using a Likert pain scale. Examiners were blinded to each other diagnoses.

Data were summarized using summary tables and descriptive statistics. Non-parametric data between groups were compared using the Chi-Squared test or the Fischer test (when anticipated values were small). For continuous variables, the Mann-Whitney test was used. Gaussian variables were contrasted using the T-test.

Protocol and all forms were reviewed and approved by the Investigation Review Board of the Federal University of Minas Gerais, and by the Committee (0500.203.000-10) Research Ethics Unifenas, Belo Horizonte, Brazil (217/2010).

RESULTS

Among individuals with headache (n=289), mean age was 42.7 years, while in individuals with TMD symptoms, it was 37.1 years. Women represented 86.9% of headache sufferers and 75.6% in the TMDs group (p=0.015). Most participants had less than 8 years of formal education. Demographic data are presented in Table 1.

Migraine was diagnosed in 79.8% of headache sufferers and 25.6% of those with TMDs (p<0.001). TTH happened in 20.4% and 46.1% respectively (p<0.001). CDH with medication overuse was the diagnosed in16.6% of headache sufferers and 3.8% of TMD sufferers (p=0.004) (Table 2).

Table 1. Demographic data at the two specialty centers

	Headache center (n=289)	Oral clinic (n=78)	p-value
Sex			
Women	86.9% (251)	75.6% (59)	0.015**
Men	13.1% (38)	24.4% (19)	
Years of school			
< 8 years	52.3% (136)	23.2% (16)	<0.001*
8-15 years	35.0% (91)	59.4% (41)	
> 15 years	12.7% (33)	17.4% (12)	

(*) Pearson's Chi-square Test; (**) Mann-Whitney Test.

TMD happened in 67.1% of those with headache and 97.4% of those with TMDs. Among the TMD sufferers, painful muscular dysfunction happened in 49.5% of those with headache vs. 23.1% in those form the TMDs group (p<0.001). Articular TMD was rarely observed among those from the headache group (1.4%) but happened in 15.4% in those from the TMDs group (p<0.001). Coexisting muscular and articular TMD happened in 59.0% of the TMDs patients (Table 3). TMD with myofascial pain happened in 48.1% of headache sufferers and 70.5% of those with TMDs (p<0.001). Local muscle soreness was more common in the headache sufferers than in those with TMDs (p=0.047) (Table 4).

DISCUSSION

Headache and TMD are two painful disorders that are comorbid and may sometimes be disabled, requiring specialized treatment. Better characterization of the comorbidity is necessary as a prelude to customized treatment. Our study adds to the field by formally assessing patients from two specialty clinics using gold-standard diagnostic criteria.

As reported by others, women were more commonly affected by both disorders, specially at young adulthood and middle-age[1,3-6,8-10,12-14,22], and it seems that the female predominance is amplified at the specialty care, relative to community studies[3,6,20,23]. Since migraine and TMD have different physiopathology, we did not expect to find identical gender ratio in both groups. Nonetheless, part of this difference may be justified by the fact that when TMD and migraine co-occur, migraine tends to be more severe than when they do not, which would channel women with more severe TMD to the

Table 2. Headache types and frequency as a function of place of enrollment.

	Headache center (n=289)		Oral clinic (n=78)		p-value
	%	95%CI	%	95%CI	
Migraine	79.89	[74.16; 83.63]	25.64	[15.73; 35.55]	<0.001*
Tension-type headache	20.42	[15.74; 25.09]	46.15	[34.84; 57.47]	<0.001*
Chronic daily headache	16.61	[12.29; 20.93]	3.85	[0.52; 8.21]	0.004*

(*) Pearson's Chi-Square Test.

Table 3. Temporo-mandibular diagnosis as a function of place of enrollment.

	Headache center (n=289)	Oral clinic (n=78)	p-value
No TDM	32.9% (95)	2.6% (2)	<0.001*
Muscular	49.5% (143)	23.1% (18)	
Articular	1.4% (4)	15.4% (12)	
Muscular and articular	16.3% (47)	59.0% (46)	

TDM: temporomandibular disorders; (*) Pearson's Chi-Square test;

Table 4. Temporomandibular disorder types as function of place of enrollment.

	Headache center		Oral clinic		p-value
	Prevalence	95%CI	Prevalence	95%CI	
Disc dislocation with reduction	3.46%	[1.34; 5.58]	28.21%	[17.99; 38.42]	<0.001*
Disc dislocation without reduction	0.35%	[0.34; 1.03]	10.26%	[3.37; 17.14]	<0.001*
Spontaneous dislocation	0.69%	[0.27; 1.65]	7.69%	[1.65; 13,74]	0.002**
Synovitis/ capsulitis	17.65%	[9.24; 26.06]	42.31%	[31.10; 53.52]	<0.001*
Myofascial pain	48.10%	[42.30; 53.89]	70.51%	[60.17; 80.86]	<0.001*
Local muscle soreness	18.34%	[13.85; 22.83]	8.97%	[2.49; 15.46]	0.047*
Myospasm	0%	–	8.97%	[2.49; 15.46]	<0.001**

(*) Pearson's Chi-Square test; (**) Fisher's exact test.

headache center rather to the TMD center[10]. Furthermore, it is well established that women are more likely than men to suffer pain episodes as a function of neuroendocrine events and of the reproductive stage[10,24-26]. Menstrual migraine is well known to be more severe and refractory to treatment than non-menstrual migraine[10,24], and a limitation of our study was not to characterize this migraine subgroup, since this would require longitudinal follow-up and use of dairies.

We found strong association between migraine and TMD pain, as previously described[10,12-20]. Gonçalves et al., in a population-based study, found that TMD symptoms are more likely to occur among those who present any headache type. When three or more TMD symptoms were present, headache occurred in 72.8% versus 37.9% of those who did not present any TMD symptoms[13], as confirmed by others[15]. Furthermore, when assessing a clinic-based sample, they found that the comorbidity of TMD with migraine, CDH, and TTH, happened only for the muscular form, and not for the articular type[18]. They also found that severity of TMD correlated with increased headache frequency[15,18]. Our data strongly support their findings and this is of importance, since Bevilaqua-Grossi et al. reported that TMD with myofascial pain is strongly associated to increased headache frequency[27].

Of interest is the fact that we found more TTH sufferers in the TMD clinic than in the headache center. TTH is the most prevalent of the primary headaches in the general population, with prevalences ranging from 38-78%[1,28]. In a telephone-based interview conducted in Brazil, prevalence was 13%, while probable TTH happened in other 22.6%. Thus, further studies should focus on the relationship between TMD and TTH. In another clinic-based study, findings were similar to ours[29].

Finally, we also found evidence that CDH and TMD are comorbid, as suggested by others, where painful TMD was strongly associated with specific CDH types[13,14,18,20,27,30].

This study has several limitations, in addition to the lack of controlling for menstrual cycle. First, both groups come from specialty care, without a contemporary control from the population. Second, psychiatric comorbidities were not assessed and this is of importance, since they may be related to both headaches and TMD. Finally, patients were not matched by age and gender (since they were consecutively enrolled).

We conducted a study independently identifying patients from two specialty centers, one in headache and one in TMD. We found strong evidence of comorbidity between both disorders and we confirmed previous findings about the specificity of TMD pain and of TMD with muscular symptoms in the comorbidity. We also found evidence of an increased cluster of TTH sufferers in the TMD clinic, and this finding must be further elucidated.

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