



Original Article

Evaluation of primary headache associated with temporomandibular dysfunction in adolescents from Santos, SP, Brazil: an observational study

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Abstract. [Purpose] Evaluate the association of primary headache and Temporomandibular Dysfunction in healthy adolescents from the Santos, SP, Brazil. [Participants and Methods] A total of 208 adolescents, aged 11 to 16 years old were randomly selected at the dentistry clinic at Universidade Metropolitana de Santos. For that, the Fonseca Anamnestic Index was applied, including information such as: limitation when opening the mouth and moving the jaw, headaches, pain in the temporomandibular joint, noises in the temporomandibular joint, and the habit of tightening or grinding the teeth. The data were submitted to descriptive statistical analysis and the χ^2 test and Fisher's exact test were used to evaluate the association of categorical variables. [Results] The results were 63% of male participants, and 61% of female participants had Temporomandibular Dysfunction. In both genders headache was associated with the presence of Temporomandibular Dysfunction, with 93 participants with light headache and 39 with moderate headache. [Conclusion] There was an association between headache and the presence of Temporomandibular Dysfunction, and the percentage of affected males was slightly higher among this association. In the sample of adolescents who presented Temporomandibular Dysfunction, moderate headache was the main reported symptom of both genders.

Key words: Headache, Temporomandibular joint, Adolescents

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INTRODUCTION

According to the American Academy of Orofacial Pain, temporomandibular dysfunction (TMD) is part of a subtype of orofacial pain that is characterized by multiple signs and symptoms affecting the chewing muscles, temporomandibular joint and accessory structures involving the stomatognathic system. The manifestations of pain are usually in the region of the temporomandibular joint¹⁾ (bilateral or unilateral), followed by limitation of mandibular movements, articular sounds such as clicks and noises during the mandibular excursion movements, and headache¹⁻³⁾.

Orofacial pain is all pain that affects the face and mouth, having its origin in hard or soft tissues. These chronic pains

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can manifest in the frontal, suboccipital, temporomandibular joint (TMJ), chewing muscles and accessories, suprascapular musculature, primary headaches and their other types (such as tension headache and migraine), rheumatic diseases and other pain^{4,5}). As to its etiology, the literature is very clear as to its multifactorial origin, as it is demonstrated in several studies^{1,3,6}.

The adolescence phase is the intermediate between childhood and adult life, comprising the age group between 10 and 19 years, according to the World Health Organization—WHO⁷). This phase is very sensitive, and careful attention, especially in dentistry, through health prevention, has a positive impact on the quality of life of these individuals. In this sense, one of the problems that adolescents may present is temporomandibular dysfunction, either with acute or chronic damages⁵).

During human development, the prevalence of temporomandibular dysfunction has a progressive increase, affecting children and adolescents and becoming more potent in adulthood^{1,5,8–10}). Primary headaches have detrimental impacts on the quality of life regarding the biopsychosocial aspects, which are aspects that do not separate the mind and body of the individual, including biological, psychological and social effects^{3,10}).

Thinking about prevention, there are measures that can be adopted, such as controlling risk factors that predispose to the installation of TMD. When this clinical practice is adopted, there is no doubt as to the benefit, besides the prevention of major damages. Risk factors present in adolescence as trauma (or microtrauma) in the head and neck region, parafunctional habits, primary headache, malocclusion^{1,2,6,9–11}), stress, anxiety, depression, sleep disorders, muscular hyperactivity, and restlessness may adversely affect the individual, and, in these cases, temporomandibular dysfunction is observed more frequently^{4,8,10,11}).

Orofacial pain, in its most diverse stages, is the main complaint of patients affected by temporomandibular dysfunction, ranging from mild, associated only to discomfort, to extreme pain, compromising all activity and function of the stomatognathic system¹⁰).

According to Manfredi et al.¹²), the symptom of pain in the mandible is referred to when there is overactivity of the masseter muscle. When the complaint is headache, we understand that there is overactivity in the temporal muscle⁵). Whereas otalgia and retro bulbar pain are associated with sensitivity in the lateral pterygoid muscle⁵). Pains related to swallowing, with perception at the angle of the mandible, are due to the medial pterygoid muscle^{5,12}).

The Fonseca Index¹³) is an anamnestic index, developed in 1994. It is easy to apply and can be used in several age groups. This evaluation instrument includes information about difficulties in mouth opening and moving the jaw, pain in the head, nape, neck or joint regions, noise in the temporomandibular joints, and the habit of tightening or grinding the teeth. It consists of ten questions, for which the answers can be “yes” (10 points), “sometimes” (5 points) and “not” (0 points). For each question, only one answer can be ticked. The sum of points is used to classify the degree of severity of the temporomandibular dysfunction^{3,11}).

The description of headache is referred pain in the cephalic and cervical segments and it is one of the main problems already identified in health services. At present, the association between primary headaches and temporomandibular dysfunction is part of several clinical and epidemiological studies¹⁴), because headache is considered the most present symptom and the most common complaint reported among the symptoms of temporomandibular dysfunction. However, their correlation cannot yet be confirmed^{14,15}).

Regarding the important and relevant factors in a detailed anamnesis, we can identify predisposing factors (which increase the risk of temporomandibular dysfunction), initiating factors (which cause dysfunction) and perpetuating factors (which interfere in the control of dysfunction)⁴). Thus, the population of adolescents living in Santos, SP, Brazil can present particularities and characteristics that may interfere in the conditions of stress, anxiety and several other factors.

Thus, the present study's main objective was to evaluate the association of primary headaches and temporomandibular dysfunction in adolescents from the Santos, SP, Brazil. What differs our study from other is the fact that this the first study to use the Fonseca Anamnestic Index in adolescents, as well as evaluate its results association with headaches.

PARTICIPANTS AND METHODS

The study followed the regulatory norms of research in humans with submission and approval to the Research Ethics Committee of the Faculty of Dentistry, at the Metropolitan University of Santos (UNIMES), approved under number 2,063,120/2017.

For this study, 208 healthy adolescents of both sexes living in Santos, SP, Brazil were evaluated. They were students who were randomly selected at the dentistry clinic at Universidade Metropolitana de Santos. Adolescents of both genders, having the free informed consent term, and the assent term, both duly signed, aged between 11 and 16 years were included in the research. Individuals who presented facial/dentofacial anomalies, who did not present the complete permanent dentition until the 2nd molar, who were in orthodontic or orthopedic treatment of the jaws, psychological and/or physiotherapy were excluded. Individuals who used myo-relaxing and/or anti-inflammatory medication and occlusal plaques were also excluded.

The Fonseca Anamnestic Index¹³) was applied (Table 1) by the same examiner in all participants. This instrument has been checked for its validity and reliability and has had satisfactory results^{14,15}). The results were computed and the statistical analysis was performed, adopting a significance level of 95% ($p < 0.05$). The statistical analysis of the results was performed using the program SPSS 12.0 for Win. The χ^2 test and the Fisher's exact test were used to assess the association of categorical variables.

Table 1. Fonseca questionnaire applied to adolescents

Question	Yes (10)	No (0)	Sometimes (5)
Is it difficult to open your mouth?			
Is it difficult to move your mandible to the sides?			
Do you get tired/achy when you chew?			
Do you have frequent headaches?			
Do you feel pain in the neck or torticollis?			
Do you have ear or joint (TMJ) pain?			
Have you noticed if you have TMJ noises when you chew or open your mouth?			
Have you ever noticed if you have a habit like tightening and/or grinding your teeth (chewing gum, biting pencils or lips, gnawing nails)?			
Do you feel that your teeth do not articulate well?			
Do you consider yourself a tense or nervous person?			
Obtaining the index:	Anamnestic index	Degree of impairment	
Sum of points assigned above	0–15	Without TMD	
	20–40	Light TMD	
	45–65	Moderate TMD	
	70–100	Severe TMD	

Table 2. Distribution of TMD according to gender

Gender		TMD		Total	p-value
		No	Yes		
Male	N	36	63	99	p=0.328
	%	36.4%	63.6%	100.0%	
Female	N	29	61	90	
	%	32.2%	61.8%	100.0%	
Total	N	65	124	189	
	%	34.4%	65.6%	100.0%	

Table 3. Distribution of TMD in relation to reports of headache

Headache		TMD		Total	p-value
		No	Yes		
No	N	32	25	57	p<0.001*
	%	56.1%	43.9%	100.0%	
Light	N	29	64	93	
	%	31.2%	68.8%	100.0%	
Moderate	N	4	35	39	
	%	10.3%	89.7%	100.0%	
Total	N	65	124	189	
	%	34.4%	65.6%	100.0%	

RESULTS

The program considered as valid samples 189 participants, being: 52.4% (n=99) of the male gender, and 47.6% (n=90) of the female gender, aged between 11 and 16 years, and a mean of 13.24 years (standard deviation=1.18). Regarding the gender and TMD, there was no statistically significant association. According to statistical analysis (p<0.05), the results of the sample were: 63.6% of males had TMD and 61.8% of females had TMD, equivalent to 100% (Table 2).

When evaluating headache and TMD, the present study revealed that there is an association between presenting TMD and having headache. The largest association was found in individuals with TMD and moderate headache. According to statistical analysis (p<0.05), the sample obtained the following results: 30.2% (n=57) did not present any type of headache, 49.2% (n=93) presented light headache and 20.6% (n=39) presented moderate headache (Table 3).

DISCUSSION

DTM is a subtype of orofacial pain, referring to a group of clinical conditions that involve bilateral or unilateral TMJ, mastication and accessory muscles, and other related structures that make up the stomatognathic system. Considered to be multifactorial because it presents diverse signs and symptoms, there are still controversies to the possible risk factors for its onset^{1, 3, 6}.

The manifestations of pain are usually in soft and hard tissues in the orofacial region. The most common are bilateral or unilateral TMJ pain, limitation of jaw movements (opening, closing, laterality and protrusion), TMJ noises and clicks, pain in the mastication muscles, primary headaches, acute or chronic pain in the frontal and occipital cephalic segment, and other presentations of pain¹⁻⁵.

According to the scientific literature, the prevalence of TMD signs and symptoms tends to increase with age, particularly in adolescence to adulthood. The aetiology of TMD in adolescents is more complex than in adult individuals, but in both, its character remains multifactorial. The possible etiological factors that manifest pains are different in adolescent individuals.

According to the literature, the signs and symptoms that characterize TMD are more prevalent in females^{3, 5}, which differs from the results found in the present study. Motta et al.³ carried out a study evaluating 3,538 adolescents to determine the prevalence of TMD signs and symptoms and their relationships. The results showed a high prevalence of TMD in adolescents, with girls having TMD in 80.7%, while boys with TMD represented only 66%. These results are consistent and similar to others that also reveal a significantly higher percentage of female TMD. This difference between gender may be due to physiological factors, such as hormonal variation^{3, 5}, but the literature needs more studies to be able to support this possibility.

Several studies describe the prevalence of TMD in children and adolescents varying between 9.8% and 80%. Authors report that this percentage will depend on the age group analysed, sample size, type of study and method of evaluation^{9, 14, 16-18}. We believe that the high prevalence of TMD in this studied group may be due to stress and anxiety, since the participants were, in the majority, students who usually are under stressful situations such as tests, the need for colleagues' acceptance and even choosing a future carrier.

Headache is a common condition, much described in the scientific literature. Among other symptoms that affect the population, primary headache stands out as the third place in the world in incidence. The most reported symptoms are localized or referred pain in the cephalic or cervical segments and it may be of different duration and intensity. When reported daily, primary headache can often reveal chronic headache¹⁴. According to a study by Requião¹⁷, 232 medical records of patients with temporomandibular dysfunction were analysed, and headache was present in 163 patients (70.25%), mostly females (74.87%).

Nowadays, the association between primary headache and TMD is part of several clinical and epidemiological studies¹⁸, because headache is considered to be the most present symptom and the most common and debilitating complaint reported among TMD symptoms, but there are studies that did not confirm their association^{14, 15}.

In the present study, when evaluating headache and TMD, the sample revealed similarity in relation to several studies in the scientific literature, which affirm an association between TMD and headache. The largest association is of individuals with TMD and moderate headache. The sample obtained the following results: 49.2% (n=93) had light headache and 20.6% (n=39) presented moderate headache. These results showed that the prevalence of headache was associated with the presence of TMD in the adolescent individuals of the present study sample.

The Fonseca anamnestic questionnaire is a reliable questionnaire to the verification of the consistent headache in the presence of TMD¹⁷. The signs and symptoms were simple, clear and effective tools, being easily understood by the selected individuals, reducing a possible influence on the answers. The indexes and questionnaires revealed signs and symptoms of TMD and are advantageous because they are easy to apply by general practitioners or epidemiologists^{11, 18}.

As study limitations, we can cite the fact that only one form of evaluation of TMD was used and the difficulty to get parents or guardians to sign the informed consent form.

In conclusion, the present study presented important clinical relevance, since it was able to prove the association between headaches and the presence of TMD in adolescents from *Santos, SP, Brazil*. However, when it comes to the disagreement between sexes, there is a need for new studies to precisely evaluate these associations, thus promoting control and interventions for individuals in the presence of these associated signs and symptoms.

Conflict of interest

None.

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