






PRIMARY HEADACHE AND MYOFASCIAL PAIN: A DATA BASED STUDY

Cefaleia primária e dor miofascial: um estudo baseado em dados

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ABSTRACT

Aim: This study aimed to evaluate the relationship between the presence of primary headaches and myofascial pain in orofacial patients. **Materials and methods:** Six hundred and ninety-nine records of patients seeking treatment in a specialized orofacial pain clinic were assessed. The primary diagnostic categories of headache and myofascial pain were recorded. Data analyses were carried out by Pearson Chi-square and Logistic Regression, with a p-value of 0.05. **Results:** Average age of patients was 34.6 years. Females constituted 82.8% of the sample. A relationship between the presence of tension-type headache and myofascial pain was found ($p=0.00$); however, this relationship was not found for the presence of migraine and myofascial pain ($p>0.05$). **Discussion:** Tension-type headaches may be triggered or perpetuated by trigger points in orofacial structures. **Conclusion:** It can be concluded that trigger points in myofascial pain patients can play an important role in the genesis of tension-type headache. **Keywords:** Headache disorders, primary. Tension-type headache. Migraine disorders. Myofascial pain syndromes.

RESUMO

Objetivo: Este estudo avaliou a relação entre a presença de cefaleia primária e dor miofascial em pacientes orofaciais. **Materiais e métodos:** Foram avaliados 699 prontuários de pacientes que buscavam atendimento em clínica especializada em dor orofacial. As categorias diagnósticas primárias de cefaleia e dor miofascial foram registradas. A análise dos dados foi realizada pelo Qui-quadrado de Pearson e Regressão Logística, com valor de $p=0,05$. **Resultados:** A idade média dos pacientes foi de 34,6 anos. O sexo feminino constituiu 82,8% da amostra. Foi encontrada relação entre a presença de cefaleia do tipo tensional e dor miofascial ($p = 0,00$); entretanto, essa relação não foi encontrada para a presença de enxaqueca e dor miofascial ($p > 0,05$). **Discussão:** As cefaleias primárias do tipo tensionais podem ser desencadeadas ou perpetuadas por pontos-gatilhos nas estruturas orofaciais. **Conclusão:** Pode-se concluir que os pontos-gatilhos em pacientes com dor miofascial podem desempenhar um papel importante na gênese da cefaleia do tipo tensional. **Palavras-chave:** Transtornos da cefaleia primários. Cefaleia do tipo tensional. Transtornos de enxaqueca. Síndromes da dor miofascial.

INTRODUCTION

Several studies have demonstrated an association between headache and temporomandibular disorder (TMD)^{1,2}. Headaches are common symptoms in TMD patients (48% to 77% of cases)² because the source of pain is the trigeminal system in both disorders¹. However, the relationship between TMD and headache may be confusing and suggests that the two may be separate entities, but one may be considered as triggering or perpetuating factors for the other¹⁻³.

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According to the International Headache Society, the most frequent primary headaches include tension-type headache and migraine. The location, duration, and intensity of the pain, and some other associated signs and symptoms assist differentiate these disorders⁴.

Tension-type headache is the most common type of primary headache (over 70% in some cases) and can be subdivided into episodic and chronic⁵. It is mainly bilateral, with a pressing or tightening quality, mild to moderate intensity, and not aggravated by routine physical activity. It is not accompanied by nausea or vomiting, but photophobia or phonophobia can be present. Headaches last from 30 minutes to 7 days⁶. While migraine is a recurrent headache occurring during 4 to 72 hours, generally unilateral, pulsating in quality, and moderate to severe in intensity. It is aggravated by routine physical activity, accompanied by nausea or vomiting and/or photophobia and phonophobia. It may or may not be associated with aura, which represents reversible focal neurological symptoms, which last for less than 60 minutes before the pain started^{7,8}.

Myofascial pain, a TMD category, is defined as pain of muscle origin and/or autonomic phenomena, referring to active trigger points, with associated dysfunction⁹. Myofascial pain is often neglected in the treatment of headache¹⁰, although headache can be a consequence of TMD⁴. According to some studies, tension-type headaches and migraine may be perpetuated by trigger points in orofacial structures¹¹, which is why it should consider the possible association of TMDs and primary headaches¹². This retrospective study aimed to evaluate the relationship between the presence of primary headaches and myofascial pain in orofacial patients.

MATERIAL AND METHODS

This study was approved by the Research Ethics Committee of the Bauru School of Dentistry (protocol number: 105/2010). Six hundred and ninety-nine (699) patients' records seeking treatment in one specialized Orofacial Pain Clinic were assessed for this study. Data were collected from the initial questionnaire, filled out by the patient, containing information about complaints, duration, and intensity of pain/dysfunction, and thorough clinical examination, including anamnesis and physical inspection temporomandibular joint (TMJ) and muscle palpation. Both completed in the same appointment.

The presence of tension-type headache was determined by self-reporting of episodic headache characterized by pressure sensation. The presence of migraine was determined by a self-report of one-sided pulsating headache, lasting 4 to 72 hours, accompanied by nausea and/or vomiting and photophobia and/or hyperacusis.

The myofascial pain syndrome was characterized by the presence of trigger points in the masticatory muscles referring to pain in the orofacial region. The patients that presented muscle pain without trigger points, TMJ pain, or any other sort of pain were considered as patients without myofascial pain.

Data analyses were carried out on the correlation between headache (tension-type or migraine) and myofascial pain, by tests Pearson Chi-square and Logistic Regression, considering age and gender as confounders. A p-value <0.05 was considered significant. The odds ratio was used as a measure of relative risk and the 95% confidence intervals.

RESULTS

The sample average age was of 34.6 years (range 12-75 years), of which 66 (9.5%) were ≤ 17 years old, 233 (33.3%) were 18-30 years old, 237 (33.9%) were 31-44 years old and 163 (23.3%) were ≥ 45 years old. Considering gender, the sample was constituted of 579 (82.8%) of females.

The relationship between tension-type headache and myofascial pain evaluated by the Pearson Chi-square test showed a statistically significant association ($p=0.00$). The logistic regression analysis revealed that the probability of experiencing tension-type headache for myofascial pain individuals was significantly higher ($p=0.000$; OR = 2.40; 95%CI= 1.61- 3.56). Table 1 shows the results for tension-type headache and myofascial pain, according to the Pearson Chi-Square test and Logistic Regression.

Table 1: Myofascial pain and tension-type headache.

		Tension-type headache				χ^2 (unadjusted)		Logistic (adjusted)	
		No		Yes		p	OR (95%CI)	p	OR (95%CI)
		n	%	n	%				
Myofascial Pain	No	399	86.5	62	13.5	0.000	2.61 (1.77- 3.84)	0.000	2.40 (1.61- 3.56)
	Yes	169	71.0	69	29.0				
Gender	Men	108	90.0	12	10.0	0.007	2.33 (1.24- 4.38)	0.054	1.88 (0.99- 3.57)
	Women	460	79.4	119	20.6				
Age	≤ 17	56	84.8	10	15.2	0.854		0.533	0.99 (0.98- 1.01)
	18-30	190	81.5	43	18.5				
	31-44	190	80.1	47	19.9				
	≥ 45	134	82.2	29	17.8				

A statistical significant association was observed between migraine and myofascial pain, as evaluated by the Pearson Chi-square test ($p=0.042$). The logistic regression analysis revealed that the probability of experiencing migraine in myofascial pain individuals was not significant ($p=0.154$), this result means that age and gender were acting as confounders during the Chi-Square analysis (unadjusted). Table 2 shows the results for myofascial pain and migraine, according to the Pearson Chi-Square test and Logistic Regression.

Table 2: Myofascial pain and migraine.

		Migraine				χ^2 (unadjusted)		Logistic (adjusted)	
		No		Yes		p	OR (95%CI)	p	OR (95%CI)
		n	%	n	%				
Myofascial Pain	No	432	93.5	30	6.5	0.042	1.76 (1.01- 3.05)	0.154	1.51 (0.86- 2.67)
	Yes	211	89.0	26	11.0				
Gender	Men	115	95.8	5	4.2	0.090	2.21 (0.86- 5.66)	0.178	1.92 (0.74- 4.99)
	Women	528	91.2	51	8.8				
Age	≤ 17	64	96.9	2	3.1	0.103		0.800	1.00 (0.98- 1.02)
	18-30	217	93.1	16	6.9				
	31-44	211	89.0	26	11.0				
	≥ 45	153	93.8	10	6.3				

DISCUSSION

These results indicated that: (1) a correlation between the presence of tension-type headache and myofascial pain; (2) an absence of a relationship between the presence of mi-

graine and myofascial pain. Despite the weakness that no standard diagnostic criteria have been used, the population of this study was very similar to the sample of several studies that previously evaluated the prevalence of signs and symptoms of TMD in a population seeking treatment using the RDC/TMD^{13,14}.

Some studies found evidence that active trigger points in several head and neck muscles are common in subjects presenting with tension-type headache^{15,16}. Palacios-Ceña *et al.*¹⁶ studying the palpation of the temporal, masseter, suboccipital, upper trapezius, and sternocleidomastoid muscles in patients with tension headache, concluded that active trigger point numbers were significantly associated with headache ($p = 0.037$). Furthermore, studies show that active trigger points are correlated with the frequency, duration, and intensity of headache episodes in tension-type headache patients¹¹. Wieckiewicz *et al.*¹⁷ found a positive association between tension-type headache and pain-related TMD. The results of this study confirmed a significant overlap between headache and painful TMD ($p = 0.0000$; OR = 4.77; 95% CI 2.44-9.32)¹⁷. These conclusions are following the findings of the present study as we found a strong association ($p=0.000$) between the presence of myofascial pain and tension-type headache.

There are some hypotheses that attempt to explain the pathophysiology of the association of myofascial pain with tension-type headache. Fernández-de-las-Peñas¹⁸ proposed the prolonged nociceptive stimuli may be responsible for converting the primary episodic headache into chronic¹⁸. This study proposed that local contraction of trigger points may promote hypoxia and ischemia by releasing endogenous substances, such as bradykinin, which stimulate the release of prostaglandins and decrease the pain threshold by causing sensitization of peripheral sensory afferents¹⁸. Another theory postulated by the same author involves a combination of peripheral sensitization with central sensitization mechanisms¹⁸. By this hypothesis, the active trigger points may be able to stimulate the trigeminal nucleus caudalis and hence triggering other headaches¹⁸.

The clinical trial performed by Gildir *et al.*¹⁹, in which patients with tension-type headache received trigger point dry needling compared with sham dry needling in any area of adipose tissue without trigger points, showed that the needling at the trigger points was significantly effective and safe to reduce the frequency, intensity and duration of patients' headache compared to false needles ($p < 0.05$). This suggests a possible relationship between trigger points and primary headache since the needles brought a reduction in the pain intensity of the patients¹⁹. Pires *et al.*²⁰ concluded that women patients with migraine or tension-type headache had lower pressure pain thresholds and higher pain intensities in relation to the control group ($p < 0.01$) with no difference between the tension headache and migraine groups ($p > 0.05$).

The results of a narrative review showed that the occurrence of active myofascial trigger points is prevalent in tension-type headaches and migraine¹¹. In another systematic review, results of the meta-analysis showed a positive association between pain-related TMDs and migraine; however, the association between pain-related TMD and a tension-type headache was controversial¹². Once present, the trigger points contribute substantially to migraine symptoms²¹⁻²³. In cases of a positive association between migraine and pain-related TMD, it reduces the nociceptive threshold of myofascial structures, causing masticatory muscle pain²⁴. However, there have been inconsistencies and controversies in the literature about the correlation between active trigger points and frequency and duration of migraine attacks¹¹.

In the present study, the Pearson Chi-Square test initially demonstrated a correlation between migraine and myofascial pain ($p=0.042$); however, when a Logistic Regression was performed considering age and gender as confounders, the p -value was adjusted and the correlation ceased to exist ($p=0.154$). Such evidence has been reported in two studies by Ferracini *et al.*^{25,26} that also found no correlation. Other studies found an association between

the presence of trigger points and migraine^{12,21-23} belike because that these authors did not consider age and gender as confounders. Ferracini *et al.*²⁶ analyzed the presence of trigger points in female patients with migraine concluded that trigger points can be initiators or enhancers in the onset of a migraine, however because of their multifactorial origin, no positive association was found between the presence of trigger points and migraine²⁶.

Although primary articles are needed, the results reported in this investigation should be considered in the treatment of primary headaches and TMD. Therefore, the diagnosis of TMD is essential to distinguish between headache attributed to TMD and tension-type headache¹². The fact data of systemic conditions, like fibromyalgia, were not collected, may be considered a source of potential bias.

CONCLUSION

The data of the present study allow us to conclude that the presence of myofascial pain trigger points can play an important role in tension-type headache.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

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