Evaluation of body painful areas in patients with muscular temporomandibular disorder: a retrospective study

Avaliação das áreas de dor no corpo em pacientes com disfunção temporomandibular muscular: estudo retrospectivo

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ABSTRACT

BACKGROUND AND OBJECTIVES: Among temporomandibular disorder classifications, masticatory muscles myofascial pain is the most frequent. Its multifactorial etiology makes its treatment difficult. Identifying other painful sites related to temporomandibular disorders may help controlling comorbidities and, as a consequence, improving their symptoms. This study aimed at evaluating the presence of body pain in temporomandibular disorder patients, the frequency of such reports and their location.

METHODS: We have evaluated 328 medical charts of the Dental Research Center São Leopoldo Mandic, with diagnosis of muscular temporomandibular disorder. Patients were evaluated by means of a body map to locate pain complaints.

RESULTS: From 328 analyzed medical charts, 180 (55%) had body pain (160 females, 20 males), and 148 (45%) had facial pain only (116 females, 32 males). Areas with most frequent pain reports were cervical, lumbar and shoulders. Females had more body pain (with pain n=160, without pain n=116, p<0.001) as compared to males (with pain n=20, without pain n=32) with statistical difference. In most cases pain has affected both body sides (bilateral face 67%, bilateral body 92%).

CONCLUSION: Most patients with temporomandibular disorder had pain in body parts different from the face. Regions marked in human body drawings with more pain were cervical followed by lumbar and shoulders.

Keywords: Cervical pain, Generalized pain, Myofascial pain, Temporomandibular disorder.

INTRODUCTION

Temporomandibular disorders (TMD) are represented by musculoskeletal abnormalities involving a large spectrum of clinical temporomandibular joint (TMJ) and masticatory muscles problems. These disorders are primarily characterized by pain, joint sounds and irregular or limited jaw function¹. TMD etiology is multifactorial, including parafunctional and inadequate postural habits, bruxism, occlusal changes, overload, trauma, growth changes and stress².
Its pathophysiology is not yet clearly defined by the literature and it may have characteristics similar to other orofacial system diseases, or even as comorbidity of such changes. There is comorbidity when two diseases have correlation and temporal continuity, and may appear simultaneously or one precede the other with more than casual association, and may share common pathophysiological aspects and clinical characteristics, which often leads to diagnostic difficulty in the dental clinic. Trigeminal neuralgia, pulpitis, migraine, tension headache and fibromyalgia are some of the most common TMD-related comorbidities. TMD is considered a chronic disease, being muscular TMD a functional pain syndrome with characteristics similar to cervical pain, fibromyalgia, interstitial cystitis, irritable bowel syndrome and chronic fatigue syndrome. These conditions seem to have common etiologic factors which explain major comorbidity of symptoms. Its pathophysiological mechanisms are still being studied and seemingly show changes in sensory processing with increased neuronal membrane excitability, increased substance P levels, NMDA receptors activation, increased brain areas responsible for pain processing and decreased inhibitory influence of dorsal horn neurons on descending pain system, thus facilitating the development of central sensitization and perpetuating pain.

Clinical studies have shown that TMD patients may have several comorbidities, such as migraine, fibromyalgia, sleep disorders, anxiety and depression, and myofascial pain in addition to orofacial pain which may worsen pain and influence the possibility of developing central sensitization. TMD may also influence the management of other pain presentations. A double-blind randomized study in females with migraine and TMD has shown that migraine would only improve when both conditions were treated.

With regard to fibromyalgia, it is important to identify whether just masticatory muscles are involved with TMD or there is a generalized muscle pain where both diseases may be present, thus potentiating diffuse pain. Depression and sleep disorders are frequent among fibromyalgia patients and it is not totally clear whether it results from a specific peripheral response to central sensitization of there is low-level pain and inflammation of masticatory muscles myofascial pain. In addition to orofacial pain, TMD may also influence the management of other pain presentations. A double-blind randomized study in females with migraine and TMD has shown that migraine would only improve when both conditions were treated.

In the relationship between myofascial TMD and tension headaches, masticatory muscles pain is the common link and it is not totally clear whether it results from a specific peripheral response to central sensitization of there is local disease. Orofacial dysfunctional signs and symptoms, such as teeth clenching, parafunctional habits, irregular jaw movement and temporomandibular noises are significantly increased in tension headache patients as compared to patients without tension headache. In case of trigeminal neuralgias it is extremely important not to confuse its diagnosis with dental problems or TMD because orofacial activities (such as teeth brushing, chewing) may trigger neuralgia crises and lead to unnecessary dental procedures, such as extractions or endodontic treatments. A study from the Universidade de São Paulo group has shown a sample of 38% of patients who could be victims of such confusion because they presented both diseases, trigeminal neuralgia and odontogenic diseases, among them TMD. Pain in other parts of the body in addition to face in TMD patients may impact pain control and contribute to persistence of masticatory muscles myofascial pain. In addition, such comorbidity may be a risk factor for the development of TMD.

So, for facial pain diagnosis and treatment it is important to recognize the relationship between muscle pain and pain in different body parts, as well as to be aware of their prevalence in the population. A way to evaluate patients’ complaint of body pain are body surface maps used in medicine for the first time in 1949 where patients are oriented to mark on the drawing the location and distribution of their pain. Drawings by patients have been used in different low back pain studies and some migraine, fibromyalgia, chronic and postsurgical cervical pain studies. In orofacial studies, drawings were used by Hagberg; Allerbring & Haegers–tami; Hagberg, Hagberg & Kopp; and Blasberg & Chalmers. To improve the understanding of the extension to which facial muscle pain is followed by pain in other body parts, body map drawings of myofascial TMD patients were systematically analyzed. This study aimed at evaluating the frequency of such reports and the location with higher prevalence of body pain.

**METHODS**

This study was carried out in the Centro de Pesquisa Odontológica São Leopoldo Mandic. Data were collected from medical charts, with records of assistance of specialization and master courses on TMD and orofacial pain, of patients referred to the orofacial pain center. Clinical evaluation has followed the guidelines of the American Academy of Orofacial Pain (2013) and of the Diagnostic Criteria for Temporomandibular Disorders (DC-TMD) with regards to diagnostic criteria: muscle pain complaint in jaw, temple, ear, or in front of the ear, which is affected by movement and jaw function or parafunction. This familiar pain is replicated with masticatory muscle challenge test, that is, palpation of masseter and temporal muscles in three areas and asking patients to report whether pain is familiar or not and whether its spreads to a site different from the palpated region, thus minimizing the possibility of comorbidities influencing the diagnosis.

TMD patients were oriented to mark in a human body contour drawing other body areas with pain for more than three months, considered chronic, thus avoiding pain caused by recent trauma or other wounds. A sample of 480 medical charts of patients treated from 2010 to 2012 was retrospectively evaluated according to the following inclusion criteria: (a) diagnosis of myofascial pain in the orofacial region; (b) age between 25 and 60 years; (c) presence of 38% of patients who could be victims of such confusion because they presented both diseases, trigeminal neuralgia and odontogenic diseases, among them TMD. Pain in other parts of the body in addition to face in TMD patients may impact pain control and contribute to persistence of masticatory muscles myofascial pain. In addition, such comorbidity may be a risk factor for the development of TMD.
ence of pain drawings showing other body pains reported by patients.
From 401 evaluated medical charts, 73 were excluded for having incomplete data, totaling a sample of 328.
Body drawings used by patients to indicate pain area were divided in 45 anatomic areas according to Margolis, Tait & Krause\(^3\), viewed from the front and back (Figure 1). The professional who had diagnosed TMD was the same orienting patients about filling the drawing.

Cards were visually inspected by the chief researcher and more frequent pain areas were recorded. It was also evaluated in how many drawings pain was restricted to the face and how many had pain reports in other body parts, as well as the affected side (right, left or bilateral). In the frontal view, the drawing was divided in 22 areas and in the back view in 23 areas.

**Statistical analysis**
Statistical analysis of variance (ANOVA) and equality of two proportions and Chi-square tests were applied, being \(p<0.05\). This study was approved by the institution's Ethics Committee under protocol 0351/2009.

**RESULTS**
From 328 analyzed medical charts, 180 (55\%) had body pain on drawings (160 females and 20 males) and 148 (45\%) presented just facial pain (116 females and 32 males), with no difference between situations for this sample (Figure 2).
Areas with most frequent pain reports were cervical region followed by lumbar region, shoulders back view, shoulders front view and lower limbs front view (Figures 3 and 4).
Prevalence with regard to gender shows that females were more affected by body pain as compared to males, with statistically significant difference (p<0.001) among females when the number of patients with just facial pain was compared to the number of patients with pain in other body parts (Figure 5).

To evaluate pain laterality (right or left), only 180 patients had both facial and body pain. Most evaluated patients have reported pain on both sides. Figure 6 shows this relationship on the face.

In the body, most reports were also bilateral (Figure 7).

**DISCUSSION**

This study has found frequency of 55% of body pain present for more than 3 months in patients with muscle TMD, similar to a study by Sipilä et al.22 who have also found 55% of generalized pain in TMD patients and lower than other studies, such as the study26 that has found 71% of body pain in TMD patients and the study of Türp et al.24 which has found 67%.

It is necessary to highlight that there is high frequency of pain outside the face, which may influence TMD management since pains may be added, generating central sensitization and worsening pain. Our objective was not to evaluate the etiology of such pains, however updated studies have shown that comorbidities such as fibromyalgia, myofascial pain and migraine9,10, among others, are closely related to TMD, thus increasing the need for diagnosis of each disease for total pain control. The use of body surface maps may be a tool to help evaluation of comorbidities which may influence TMD control.

With regard to areas affected by pain, our study has shown that patients with TMD and myofascial pain often have cervical pain. This was the region with the highest index of pain with 62% (females 64% and males 45%), followed by lumbar and shoulders. Such results support the conclusion by De Laat et al.7 about the coexistence of TMD signs and functional limitation and cervical pain, when clinical TMD signs were compared to brain-cervical disorders. In this study24, 30% of cases of pain were in the lumbar region, value close to that found in our study, which was 35% (34% females and 47% males), and lower than a different study with 61% of back pain27.

A possible reason for the coexistence of TMD and cervical pain is based on the neurophysiologic conversion and sensitization principle. A constant nociceptive input in second order neurons may increase neuronal sensitivity and, with this, non-nociceptive impulses of other areas within the same segment converging to such neurons may increase the nociceptive sensation, that is, frequent impulses coming from the upper region of the trapezius may increase trigeminal spinal nucleus sensitivity and so non-nociceptive stimuli in the masticatory system could lead to painful sensation in the trigeminal region6. In these cases, patients have painful sensation in orofacial and cervical regions.

With regard to gender, our study findings have shown that most patients looking for TMD management are females, in a total of 276 as compared to 52 males. These data are already known by the literature where females have more TMD symptoms as compared to males19,21. Generalized pain was also more often reported by females, confirming data which report higher prevalence of generalized pain in females27.

The association between widespread pain and TMD in females may be important for collective public health, since currently females have a very important role also in the economic lives of families and the presence of both situations could keep them away from work for a larger period of time, thus causing social problems13. It was observed that females with myofascial pain and history of concomitant widespread
pains were more prone to having depression as compared to females with just orofacial pain.

Considering the laterality of pain, it was observed that bilateral reports were the most frequent, both in face (67.2%) and body (92%), which confirms a different study where 66% of cases of pain were bilateral. Türp et al. have also reported that bilateral pain was present in 82.5% of the sample. Since there are evidences that muscle TMD may be associated to pain in different body regions, early interventions should be the objective of the multidisciplinary team.

Our results stress the need for improving the understanding of comorbidities affecting TMD patients to improve treatment and provide their control.

CONCLUSION

Most patients with temporomandibular disorder had pain in other body parts different from the face. Most common region marked on human body drawings was cervical, followed by lumbar and shoulders.

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