

Literature Review Article

Fibromyalgia and temporomandibular dysfunction: a literature review

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Abstract

Introduction and objective: Several studies have associated temporomandibular disorders (TMD) and fibromyalgia (FM) finding a wide variation of results. The aim of this study was to review the literature about the relationship between TMD and FM. **Literature review:** For many years, TMD and FM were considered different clinical entities, but recently, some authors have reported that these two clinical situations have similarities. It is important to emphasize that both in FM and TMD pain is the main symptom, including pain in face, mandible, and headache. Besides, these pain syndromes are characterized by a decrease in pain threshold and in the capacity of attenuation of descending systems of pain modulation. The relationship of comorbidity between TMD and FM may indicate, therefore, the existence of some form of central sensitization, which is common to both diseases, sharing neurochemical events. In addition, it was found that the presence of TMD is a common finding in FM patients. **Conclusions:** It can be concluded that FM and TMD are distinct clinical entities, although they share common signs and symptoms, especially those related to pain. Furthermore, it was observed that

the prevalence of TMD in FM patients is higher than the other way around. It is also important in the diagnosis of these two diseases the differentiation between trigger and tender points, thus avoiding false diagnoses of TMD in FM patients.

Introduction

Muscular pain in face's area may be an expression of a systemic problem of muscle-skeletal pains, whose origin probably is central nervous system. This is the case of patients presenting a disorder, so-called fibromyalgia (FM), in which the pain in face is only one aspect of the disorder that involves all body's muscles [40].

Fibromyalgia is a non-articular rheumatic syndrome, characterized by diffuse, chronic muscle-skeletal pain and the presence of multiple painful areas, so-called tender points, especially at the axial skeleton [2]. Its aetiology is unknown, since occurs in varied ways, in different patients, which leads to characterize it as a syndrome instead of a disease – fibromyalgia syndrome (FMS) [5, 23, 27, 39].

Among the most common symptoms associated with this disorder have been fatigue, sleep disorders, morning stiffness, anxiety, and depression [35]. Its diagnosis is based on only clinical criteria, due to the lack of identification by complementary examinations. According to the American College of Rheumatology (ACR), the following diagnosis criteria were established: diffuse pain in the axial skeleton, at both hemi-bodies, above and below the waist; pain in 11 or more out of 18 tender points and chronic pain for more than three months [4, 23, 57]. When the number of tender points is lower than 11, but the other signs and symptoms are present, concomitantly, FM diagnosis also can be confirmed [60].

It is estimated that FM affects from 2 to 7% of world population, being more prevalent in women than men, with a 9:1 ratio [53]. The disorder more frequently occurs in subjects aging between 45 and 60 years-old, however its incidence increases with age [52]. Although uncommon, the syndrome also affects children and adolescents [12].

Temporomandibular disorder (TMD) is defined as a collective term and comprises a great number of clinical alterations involving masticatory musculature, temporomandibular joints, and their associated structures. TMD mainly sign and symptoms are: tenderness to palpation of masticatory muscles and temporomandibular joints, articular sounds, and change of mandible's dynamic [2, 15, 17, 37, 41,

42]. Also, it can be associated with psychological alterations [11, 17].

Epidemiological studies, such as those from Egermark *et al* (2001) [20] and Thilander *et al.* (2002) [54] showed that TMD signs and symptoms are found at all ages. Some researches evidenced that TMD signs and symptoms severity vary according to the subjects' age, increasing after puberty, with peaks between 20 and 40 years-old; its mildest symptoms occur in children, adolescents, and elderly [9]. Similarly to FM, most of the studies evaluating TMD differences between genders have shown more prevalence of TMD signs and symptoms in women [3, 26, 31]. TMD, according to Biondi and Picardi (1993) [10] and McNeil (1997) [37], is a disease related to female gender, since women are three times more affected than men.

Although TMD signs and symptoms evaluation is not part of FM diagnosis criteria, it is seen on literature that both clinical entities can be associated. This could be explained by four models: 1) the reduction of the pain threshold in FM is responsible for the muscle-skeletal pain in face, and therefore, FM is the predominant problem predisposing to TMD; 2) FM and TMD are associated with primary psychological alterations, i.e., they have not a direct casual relationship, but they appear due to some mental health abnormality; 3) the psychological distress observed in some fibromyalgic patients leads to a greater stress, number of medical appointments, and the diagnosis prevalence; in these cases, the patient presents FM as an initial problem, and TMD is not a complaint; 4) all painful dysfunctions are associated to an increasing in FM prevalence; therefore, TMD is the cause for FM appearance [50].

Due to the aforementioned issues, the aim of this study was to discuss the relationship between FM and TMD, through a literature review.

Literature review

For many years, TMD and FM have been considered as two distinct entities. However, some authors reported that both clinical situations present similarities [1, 7, 13, 16, 21, 32, 44, 45, 59].

Eriksson *et al.* (1988) [21] performed the first investigation describing TMD and FM relationship. The authors demonstrated that 75% of FM patients presented clinical history of TMD, ranging from moderate to severe degree, according to the Helkimo's index. These preliminary findings raised interest in the developing of further studies on clarifying the possible relationship between FM and TMD.

Pennacchio *et al.* (1998) [44] noted that 97% of fibromyalgic patients were diagnosed with TMD, and that only 30% from control group presented TMD symptoms. Manfredini *et al.* (2004) [32] found similar results: 86.7% of FM subjects showed, at least, one TMD confirmation. Nevertheless, only 10% from TMD group presented features for FM diagnosis, according to ACR criteria.

Similarly, Plesh *et al.* (1996) [45], through applying the research diagnostic criteria (RDC) and ACR criteria for TMD and FM diagnosis, respectively, found that 18.4% of TMD subjects also presented FM. However, 75% of FM patients could be classified with myogenic TMD. Moreover, FM patients showed a lower pain threshold and more severe manifestations of sleep disorders, fatigue, pain, among others, when compared to TMD patients. According to the same authors, TMD (local dysfunction) and FM (general dysfunction) are distinct clinical entities, although presenting a certain degree of common comorbidities. Furthermore, the specificities that best differentiate FM from TMD were: functional disability, difficulties for working, and dissatisfaction with their general health state.

For Hedenberg-Magnusson *et al.* (1997) [24] there would be other clinical parameters distinguishing both conditions. The authors compared a fibromyalgic to a local myalgia and healthy patient group and found that FM patients frequently presented higher intensity of TMD signs and symptoms, such as muscular and articular pain, articular sounds, and pain threshold; this was very different from the other groups tested.

However, there is not a literature consensus on whether the orofacial symptoms would be more intensively experienced by fibromyalgic than TMD patients. In an Italian comparative study, Cimino *et al.* (1998) [13] verified that, concerning to the subjective TMD symptoms, TMD and FM subjects showed common evidences of TMD, such as pain during mandible's function, articular sounds, and cephalalgia; also, they presented similarities regarding to the presence and intensity of pain in the palpation of masticatory muscles.

Similar results were found by Dao *et al.* (1997) [16], who observed a pain in face similarity

between FM and TMD subjects. Besides that, 69% of FM subjects presented pain in face during their examination, and 79.3% confessed to feel pain in face for the past six months, while 42.1% and 68.4% of TMD subjects, respectively, complaint of pain in the body at the moment of the evaluation and for the past six months. Although a very large percentage of TMD subjects reported painful conditions out of the face's area, the authors suggested that it would be unlikely that TMD is a condition of generalized pain in body, although the possibility of coexistence between FM and TMD could not be excluded.

Frequently, FM is one of the possible etiological factors of TMD [25, 49]. It is believed that TMD would be the first manifestation of FM, that is, the dysfunction symptomatology would precede the generalized pain in body [46]. Raphael *et al.* (2000) [46] assessed that 23.5% of patients presenting TMD and FM at the same time showed the concomitantly onset of the facial and generalized pain; the other patients reported that the facial pain occurred before the pain in body.

Notwithstanding, this idea should be carefully evaluated, because it may happen that TMD is diagnosed prior to FM, instead of TMD symptoms appear before body pain symptoms. Korszum *et al.* (1998) [28] found that 42% of fibromyalgic patients presented a previous diagnosis of TMD. However, most of them reported that pain in face appeared after pain in body, suggesting that the pain in face should not be considered as an early FM symptom.

Several researches have related TMD comorbidity to other rheumatologic diseases, because of the presence of common symptoms among them, such as pain in face, cephalalgia, and pain in mandible [1, 7, 59]. Despite the high degree of comorbidity, some investigators have excluded the causal role of the rheumatologic diseases in TMD, stating that such hypothesis could only be taken into account when there would be a correspondence between the origin of the facial pains (articular or muscular) and the type of rheumatism (articular or muscular). Therefore, rheumatic diseases have not been considered as TMD etiological factors, although they have been capable of aggravating TMD signs and symptoms and influencing their treatment [59]. Nevertheless, FM and TMD may share several peripheral and central mechanisms of pain [22], and it is possible that FM be an etiological factor of TMD. Several studies have already demonstrated the high prevalence (42 to 97%) of TMD in fibromyalgic patients [21, 25, 44, 45, 47]. On one hand, the orofacial manifestations such as pain and tenderness in masticatory muscles

are among the main signs and seem to be an important element of FM [29,47]. On the other hand, FM prevalence in TMD patients varied from 4 to 23.5% [22, 34, 45, 46].

Discussion

The most recent investigations on FM aetiology reported that this clinical condition occur due to an alteration in the hypothalamic-pituitary axis, which represents the main path of the neuroendocrine response to stress, altering the levels of cortisol, growth hormone, and serotonin. The same conditions have been found in subjects suffering chronic pain, including orofacial chronic pains and TMD [8, 36]. Such evidences suggest that maybe there would be a direct relationship between FM and TMD. Some correlations were found by Slavetti *et al.* (2007) [49]. In their study, 79.6% of fibromyalgic patients present at least one TMD diagnostic factor; the most found factor was inflammatory and degenerative disorders (71%), followed by muscular disorders (40,9%).

It is highlighted that, in both disorders, the pain is the main symptom. Pain has been associated to alterations in the central processing of the sensitive stimulus. Moreover, pain disorders are characterized by the reduction in both the pain threshold and the capacity of attenuation of descending systems of pain modulation. The relationship of comorbidity between TMD and FM may indicate, therefore, the existence of some form of central sensitization, which is common to both diseases, sharing neurochemical events [19].

Besides the reduction of pain threshold, FM and TMD share other signs and symptoms, such as: cephalalgia, sleep and attention disorders [1], as well as, articular sounds and movement limitations [54].

Although both diseases show common etiologic factors (anxiety and stress), they should be treated as distinct pathologies due to several reasons. TMD is related to occlusal alterations, as: side of masticatory preference, facial traumas, disc displacement, parafunctional habits, among others. On the other hand, for FM, these factors have not been totally clarified and defined by literature, yet [6, 11, 14, 30, 43, 48].

Concerning to signs and symptoms, TMD has been characterized by orofacial pains more localized in the masticatory muscles due to the presence of trigger points. When the pain is present, it displays a path towards the neck and shoulder areas. In FM, the tender points are disseminated in the muscles of several body segments, causing

systemic and generalized algic episodes associated with fatigue and pain in muscles [13, 51, 58]. It is important noting that, none out of the 18 ACR FM trigger points includes the masticatory muscles' palpation. This demonstrates that ACR does not take into consideration the orofacial involvement in the fibromyalgic syndrome [33].

Moreover, muscular palpation does not provide a distinction between tender and trigger points. Therefore, there are not parameters for differing them from each other, which may lead to a false diagnosis of TMD. A tender point manifestation (FM expression) may simulate the trigger point presence, even in its absence [33].

Conclusion

Although FM and TMD are distinct clinical entities, they can simultaneously occur, as well as, share common signs and symptoms, especially those related to pain. Furthermore, the prevalence of TMD signs and symptoms in FM patients is higher than the other way around. A multidisciplinary approach is very important in order to evaluate the both comorbidities integrally, aiming to improve the diagnosis and treatment of the population.

Since ACR does not take into account the evaluation of the orofacial pain in its diagnosis criteria, a further investigation is necessary due to the high prevalence of these pains, mainly caused by TMD, in fibromyalgic patients.

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