TEMPOROMANDIBULAR DISORDER AND OROFACIAL PAIN AND ASSOCIATION WITH DEPRESSION

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ABSTRACT

Considering that emotional factors and depression are important issues in the maintenance or worsening of TMD and analyzing the shortage of studies relating the disease to these factors, it was envisioned to carry out this study, which aimed at analyzing the occurrence of Temporomandibular Disorders (TMD) and orofacial pain, as well as evaluating its relationship with depression factors through the questionnaires of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). It was evaluated 1643 individuals aged from 20 to 65, excluding patients who had toothache, acute periodontal disease, systemic disease, psychological disorders, use of anxiolytic, anti-inflammatory drugs (except paracetamol), anticonvulsants and opioids. It was observed that 34 % were female and 66 % male, mean age 33 years, and that 66 % of the interviewees had psychological disorders such as stress, anxiety and/or depression, and that the chance of TMD increases significantly in patients with depression. After collecting the data, it was concluded that the TMD was present in most individuals presenting a picture of depression, but not necessarily all TMD individuals indicated depression, thus proving that depression is correlated not only with the etiology but also the perpetuation of TMD.

KEYWORDS: Temporomandibular disorder, depression, RDC/ TMD, pain; anxiety.

1. INTRODUCTION

Temporomandibular Disorders (TMD) are among the most common conditions of orofacial pain of non-odontogenic origin. Temporomandibular disorders (TMD) is described as a set of joint and muscle clinical problems related directly or indirectly to the stomatognathic system, so it is considered a pathological condition characterized by a set of signs and symptoms involving pain in the temporomandibular joint (TMJ) in the masticatory muscles and in the head and neck region. This dysfunction was observed and first described in 1930 by James Costen, an otorhinolaringologist doctor who witnessed a clinical situation where the patient felt pain in the ear area, which he attributes to the loss of posterior teeth because an increased internal TMJ pressure occurred [1]. Since then new terms were created as functional disorders of the temporomandibular joint, craniomandibular disorder, temporomandibular disorder which was adopted by the American Dental Association (ADA), in 1982, and is currently classified as Temporomandibular Disorders and Orofacial Pain by Federal Council of Dentistry. TMD is more prevalent in females, according to some epidemiologic studies. It was observed that in both sexes the most affected age group is in the third decade of life, with a low rate during childhood and old age[1,2,3].Usually the diagnosis of TMD is reasoned through the signs and symptoms reported by the patient, but there are other means for this diagnosis, considering the clinical signs and symptoms at the time of interview and clinical examination, questionnaires, protocols, rating scales and diagnostic criteria[1].This pattern evaluation is still used, but the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/ TMD) or Diagnostic Criteria for Temporomandibular. Disorders Research has been widely cited in the literature[2,3]. This questionnaire is divided into two parts called axis I, which seeks to investigate the diagnosis of disorders of the masticatory muscles and joints, and axis II looking for clues to changes in behavioral, psychological and psychosocial factors that are of great importance in diagnosis and treatment of TMD.

TMD patients that present symptoms of anxiety, depression and stress lead to increased muscle activity resulting in pain. There is a close relationship between patients with these emotional states and TMD[4]. Psychological factors associated with TMD can be divided into three categories: Cognitive, behavioral and emotional factors[5].

It is known that depression and anxiety are known to decrease the pain threshold, and with the patient experiencing a situation of psychological

stress, pain is manifested more intensely. Also, it was pointed out that patients with psychological disorders clench their teeth as a somatic manifestation of stress, which can aggravate the pre-existing condition of TMD.

Thus, this study aims at evaluating the relationship between TMD and orofacial pain with variables of depression in patients with 20-65-year-old, using questionnaires from the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) and the Sleep Assessment Questionnaire (SAQ), indicating the prevalence of TMD with the emotional and psychological changes.

2. METHODS

This study consists of a cross-sectional population-based, on the population of the city of Maringá, Paraná. The information referred was obtained through structured interviews conducted in the homes of the studied population, which were approved by the Standing Committee on Ethics in Research Involving Human Subjects of Ingá Faculty No 0071/11 and Brazil platform - Ministry of Health No. 70988. According to epidemiological data from the IBGE (2007), the city of Maringá, situated in the northwest of the state of Paraná is comprised of approximately 325,968 inhabitants being 48 % of men (156,464) and 52 % of women (169,503). The city has 25 Basic Health Units and a Central Unit (Department of Health), 13 hospitals and 8 higher education institutions, 43 public schools, 34 government schools, 28 private schools and 87 preschools.

The ethnic profile of the sample population of the city is made up of descendants of Italian, Japanese, Portuguese, Polish, Arabic, German, i.e., has a mixed ethnicity. The city is located 420 km from Curitiba, at an altitude of 554.9 meters, subtropical climate, with an area of 489.8 km^2. The study population was comprised of people aged from 20 to 65 years, users of the Public Health System of the city of Maringá - PR. It is estimated that the city of Maringa has 135,000 inhabitants aged between 20 and 62 years.

The following calculations for sample size were conducted to estimate the prevalence of TMD with a confidence level of 95 %. Whereas according to the data of the Municipal Health Department, the numbers of active aged 20 to 44 years are 132,620 users, with a prevalence of TMD of 5 %, margin of error of 1.5 percentage points, it would be required 806 individuals for such confidence index.

Sample Selection

It was only included people aged from 20 to 65 registered as active users of the Public Health System of the city. This strategy aims to exclude people with double insertion in the system, who has moved or died. Patients who reported acute periodontal disease (acute problems), patients with toothache due to caries and/or abscess, patients taking anti-inflammatory (except paracetamol), anxiolytics, anticonvulsants and/or opioids were excluded and those with some type of systemic disease or psychological disorders that create difficulties in applying the questionnaire. This is because the above conditions can influence the diagnosis of TMD and OFP. The list of eligible individuals in accordance with the Basic Health Unit (BHU) was obtained from the Department of Health (CIS Department). From this list, users were selected through a scheme of proportional probability to size of BHU, i.e., larger BHUs contributed with more users to compose the sample. Then, simple random samples were selected from each BHU.

Interviews

After patient selection, with a list containing the respective addresses, structured interviews were conducted at the homes of participants, with the following sequence:

a) Reading and signing the informed consent form by the patient;

b) Application of Axis II of the RDC/TMD (socioeconomic and psychosocial factors and joint movement and positioning).

3. RESULTS

The sample consisted of 34 % women and 66 % men, mean age of 33 years (SD ≥ 10). The percentage was 48 % married and a larger number of Caucasian (70 %). The vast majority had an average income of R$ 500.00 and R$ 3,000.00 (data that represents 75 % of the sample) and educational level of college graduates (49 %), which when associated with the completion of the high school allowed an increase of this percentage to 80 % of the sample.

Table 1. Socio-demographic description related to TMD (Chronic Pain Score = 3 and 4) versus control group (pain score = 0) of the extracted sample of users of the public health system of Maringá (SUS). N = 1,643.

Variables	Test Group (TMD) N=84	Control Group (asymptomatic) N=1,048	p value
Gender (%)			
Femele	81.0	59.8	<0.001 *
Male	19.0	40.2	
Age (%)			
<20 years	2.4	9.5	
20-29 years	20.2	38.2	
30-39 years	45.2	28.6	< 0.001 †
40-49 years	23.8	16.2	
50-59 years	4.8	7.3	
≥ 60 years	3.6	0.1	
Marital Status			
Married	59.5	47.9	
Single	16.7	44.0	
Divorced/ Widower	23.8	8.1	NS*
Ethnic			
Caucasian	53.6	71.5	
Black/ mestizo	39.3	23.4	<0.01*
Familiar Income (Brazilian Reais)			
High (≥ 3.000.00)	8.3	13.5	
Higher-Middle (1,000,00-2,999.00)	25.0	38.0	
Lower-Midlle (500.00-999.00)	39.3	37.0	< 0.001

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Low (<500.00)	27.4	11.5	
Education L evel			
Completed Upper Secondary	13.1	25.8	
Incomplete Upper Secondary	14.3	25.5	< 0.001 †
College Education	32.1	31.4	
Incomplete Higher Education	15.5	9.1	
Elementary School	25.0	8.3	

*Pearson´s Chi Square, † Linear-by-Linear Association.

Table 2. Prevalence of depression and somatization (Research Diagnostic Criteria for Temporomandibular Disorders - RDC / TMD Axis II) and cases of TMD (Chronic Pain Grade = 3 or 4) versus control group (Chronic Pain Grade = 0) of the extracted sample of users of the public health system (SUS) of Maringá. N = 1,643.

Variables	Test Group (TMD) N=84	Control Group (asymptomatic) N=1,048	p value
Depression (including vegetatives ymptoms)			
Scores de 0 to 4	1.3	0.51	< 0.001 §
Mean(SD)	(0.72)	(0.47)	
Depression (including vegetative symptoms) Scores de 0 to 4			
Normal (<0.535)	17.9	62.7	< 0.001 †
Moderate (From 0.535 to <1.105)	25.0	25.9	
Severe (1.000 +)	57.1	11.5	
Non-specific Physical Symptoms (pain item excluded) RDC/TMD Axis II (scores from 0 to 4)	1.06	0.3	< 0.001 †
Mean (SD)	(0.76)	(0.3)	
Non-specific Physical Symptoms (pain item excluded) RDC/TMD Axis II (scores from 0 to 4)			
Normal (<0.428)	15.5	68.6	
Moderete (from 0.428 to <0.857)	27.4	20.5	
Severe (0.857+)	57.1	10.9	
Non-specific Physical Symptoms (pain item excluded)			
Scores from 0 to 4	1.3	0.4	
Mean (SD)	(0.69)	(0.40)	
Non-specific Physical Symptoms (pain item excluded) Scores from 0 to 4(%)			
Normal (<0.500)	6.0	66.5	
Moderate (from 0.500 to < 1.000)	28.6	24.0	
Severe 1.000+)	65.5	9.5	

The average of Pain Intensity Characteristics (PCI) generated a pain score of 45 (confidence interval: CI = 95 %, ranging from 46 to 50), i.e., the vast majority had lower pain intensity with moderate movements limitation. Multivariate analysis was performed by linear regression. Backward technique was used, and initially entered the model variables: gender, income, depression and physical symptoms with and without pain. It remained associated (p>0.01) only TMD and non-specific physical symptom (with pain).

The results of our study revealed a high prevalence (66 %) of patients with psychological disorders (stress, anxiety and/or depression). According to the diagnostic method Axis II RDC/TMD, this study showed that patients with TMD had an increased risk for the occurrence of moderate/severe depression even with non-specific physical symptoms.

An important result found was that the chance of the levels of a moderate/severe depression with non-specific physical symptoms increased significantly in patients with TMD and associated sleep disturbances.

4. DISCUSSION

In recent years, a close relationship has been reported between depression and anxiety and the symptoms of many diseases, such as coronary heart disease[6], Parkinson's disease[7], and juvenile diabete[8]. This could be a fact in the field of dentistry to TMJ disorders, although the relationships are still under debate. The importance of psychological factors in the etiology of TMD, particularly myalgia, has been emphasized by a number of studies[9,10,11,12].

According to a literature review[13], clenching seems to be more associated with psychosocial disorders and psychopathological symptoms than sleep bruxism. Emotional stress can play a very important role in the etiology of period of teeth clenching and chewing muscles during stressful events[14,15,17], a factor of aggravation also observed in this study.

Given the prevalence of TMD in the study, the results showed that women are more commonly affected than men in a ratio of 4/1, results similar to other studies in which the prevalence of women in patient samples varies around 80 %[1,2,3]. Corroborating the results of this work, studies show that women who developed chronic TMD had significantly more anxiety disorders, tendency to depression and pain. In this study, the higher prevalence of pain severity was moderate intensity which generated a uniform distribution of levels of disability among the patients with TMD. Both mild depression and mild somatization in the presence or absence of pain were the most prevalent[21].

The results of this study revealed a high prevalence (66 %) of patients with psychological disorders (stress, anxiety and/or depression). The importance of psychological factors in the etiology of TMD, particularly in myalgia has also been emphasized by other important studies[11,12,16]. According to the diagnostic method Axis II RDC/TMD, this study showed that patients with TMD have an increased risk for the occurrence of moderate/severe depression even with non-specific physical symptoms. Many studies have shown the high prevalence of moderate to severe levels of depression even with non -specific painful physical symptoms in patients with TMD[17,18]. One issue to consider when studying chronic TMD with pain symptoms are the psychosocial disturbances, i.e., they predispose this painful condition, or aggravate TMD. The findings of this study support the existence of an association between pain and

depression levels and non-specific symptoms, but cannot establish a causal relationship, because of the cross-sectional design of the study.

On examination of the axis II, it is observed that depression, non-specific physical symptoms and somatization are directly linked to the condition of chronic TMD. The TMD patients showed significantly higher levels of depression, somatization and disability, according to the results of others authors[18,24].

Patients diagnosed with myofascial pain and other joint conditions had significantly higher levels of depression and somatization compared with patients who had only disc displacement. In the present study, pain occurred in the TMD group, with a low average severity generating disability ranging from mild to severe. Depression and somatization were significantly more evident among patients in the test group, where it was observed that the intensity of depression and somatization was moderate to severe intensity. Somatization is more disseminated among patients suffering from myofascial pain than among patients with articular diseases[18,20].

The role of psychosocial factors at different stages of TMD has been intensively investigated. Studies[21] suggest that psychosocial factors such as depression, stress, anxiety, alexithymia (difficulty in describing or recognizing emotions, affective constriction and fantasy life), and catastrophizing (wait or worry about major consequences from a negative situation even of minor importance) play a role in the predisposition, the onset and perpetuation of TMD and the response of these patients to treatment. The role of these elements varies with the diagnosis of TMD. TMD related to pain may, in many cases, become a chronic pain condition, although depression is prevalent among patients with chronic pain treated in specialized clinics. Results concerning the comorbidity of depression with TMD, especially with its chronic form, are divergent[19].

The role of anxiety is also controversial. The level of anxiety is found to correlate with the diagnosis of pain and to be positively correlated with muscle sensitivity in migraine patients and facial pain, it is still extremely relative despite of the anxiety being significantly correlated with many TMD studies[15,17]several researchers have reported contradictory results[20]. The main differences in most studies assessing the prevalence and role of psychological factors in patients with TMD are: The lack of distinction between acute pain and chronic pain, the small number of participants and the use of control groups without pain, despite the direct correlation also presented in this work. The prevalence and the role of psychological factors may vary, however, depending on the state of patients pain[20,22] and the more pain persists, the more opportunities there will be for psychological factors to be involved both in pain itself or its cause.

Other conditions closely linked to the etiology of TMD are related to psychological conditions. reported a significant association between TMD and psychological condition. The Axis II RDC / TMD is the most easily implemented and widely accepted instrument to assess the psychological state of the patient. Measures hereof are not intended to produce clinical psychiatric diagnoses. Instead, they evaluate the degree to which a person with TMD can be cognitively, emotionally or behaviorally impaired by these factors, and therefore how much they can contribute to the development or maintenance of the pain[23]. Although there are many studies in the literature on the association between pain and psychological status, few studies assessed the presence or absence of sleep bruxism and how this sleep disturbance may contribute to these conditions[18]. Thus, justifying the diagnosis of TMD correlated only to sleep disturbances, without investigation of other associations of cause/effect.

A study of patients with nocturnal bruxism and without orofacial pain showed a higher prevalence of depression with levels of moderate/severe and non-specific physical symptoms when patients had TMD[24]. This may suggest that, in patients with nocturnal bruxism, chronic pain would be maintained by constant pulses of peripheral sensitization of muscles that occurs as an similar pain to intense muscular pain after exercise· which may contribute to higher levels of depression and nonspecific physical symptoms, as observed in this study. These findings suggest that patients with more than one diagnosis, including muscle disorders may suffer from symptom of greater pain intensity, thus affecting, their depressive symptoms, somatization and its ability to perform daily activities. This seems to be related to the fact that the presence of muscular change is an important predisposing factor in the development of acute TMD to chronic TMD. The results of this study indicate that participants who are at a high risk of developing chronic TMD suffer more from self-reported pain, interference with daily activities, depression and somatization. Furthermore, participants with a diagnosis of TMD associated to muscle changes feel more pain during mastication in relation to other participants.

4. CONCLUSION

This study concludes that more than half of the patients analyzed present some kind of psychological problem, were the ones that present symptoms of depression, usually have temporomandibular dysfunction, but not necessarily the contrary. Even though joint dysfunction syndrome is a dental disease, the study shows that it is related with aspects of anxiety and depression.

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