Correlation Between Severity of Temporomandibular Disorder, Pain Intensity, and Pressure Pain Threshold

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Abstract

Objective: The aim of the present study was to correlate the severity of temporomandibular disorder (TMD) with the pressure pain threshold over the temporomandibular joint and masticatory muscles.

Methods: A blind, cross-sectional study was conducted involving 60 women ages 18 to 40 years with a diagnosis of myogenous TMD. Evaluations were performed using the Fonseca Anamnestic Index (FAI), the visual analogue scale, and algometry over the temporomandibular joint and masticatory muscles. Spearman's correlation coefficients (r_s) were calculated to measure the association between TMD severity, pain intensity, and the pressure pain threshold.

Results: A moderate, significant, and negative correlation was found between TMD severity and the pressure pain threshold over the left masseter muscle ($r_s = –0.276$; $P = .034$). No significant correlations were found for the other variables analyzed ($P = .124$-$.985$).

Conclusions: Temporomandibular disorder measured using the FAI was associated to the pressure pain threshold over the masseter muscle. The significant and negative association found between the score of the FAI and the pressure pain threshold over the masseter muscle demonstrated that patients with more severe signs and symptoms of TMD had a lower pressure pain threshold. (J Manipulative Physiol Ther 2018;41:47-51)

Key Indexing Terms: *Temporomandibular Joint Disorders; Pain Measurement; Myofascial Pain Syndromes*

Introduction

Temporomandibular disorder (TMD) is a clinical condition often characterized by the presence of pain, especially in the temporomandibular joint (TMJ) and masticatory muscles. Other symptoms include limited or deviated mandibular movements and joint sounds.[1,2] Because of its multifactorial etiology, TMD is a complex condition that requires diverse evaluative approaches to measure the magnitude and repercussions of the various signs and symptoms.[2,3]

Studies throughout the world have investigated the use of different assessment tools for the evaluation of individuals with TMD. Herpich et al[4] conducted a systematic review of the literature and found that the most commonly employed tools are questionnaires, patient history indices, clinical indices, and diagnostic criteria. Ribeiro-Rotta et al[5] conducted a systematic review focused on the use of computed tomography and magnetic nuclear resonance for the evaluation of joint disorders in patients with TMD. Berni et al[6] established surface electromyography of the masticatory muscles at rest as a complementary evaluative measure for TMD. Dibai-Filho et al[7] and Rodrigues-Bigaton et al,[8] respectively, concluded that infrared thermography does not have sufficient accuracy for the diagnosis of myofascial pain and arthralgia in patients with TMD. For the diagnosis of TMD, the

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Paper submitted June 3, 2016; in revised form August 10, 2017; accepted August 23, 2017.
0161-4754
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https://doi.org/10.1016/j.jmpt.2017.08.001

Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) developed by Dworkin and LeResch[9] is the internationally accepted gold standard.

In countries where Portuguese is spoken, especially Brazil, use of the Fonseca Anamnestic Index (FAI) is common in the clinical setting and research for the determination of the severity of TMD. de Oliveira et al[10] employed the FAI to identify the prevalence of signs and symptoms of TMD in Brazilian university students. Likewise, Nomura et al[11] conducted a prevalence study involving undergraduate students of a dental school in Brazil. Bonjardim et al[12] and de Santis et al[13] employed the FAI on children and adolescents.

According to Bevilaqua-Grossi et al,[14] not only should the frequency of signs and symptoms of TMD be emphasized but also the severity of symptoms and their relationship to clinical signs. Considering the findings of the study cited, the justification for the present investigation is the determination of the relationship between the FAI score and the clinical measures commonly used for the investigation of pain in individuals with TMD because, so far, this relationship has not yet been established in the literature. Thus, the aim of this study was to measure correlation of the severity of TMD with pain intensity and the pressure pain threshold over the TMJ and masticatory muscles, presuming the hypothesis of a significant association between the variables tested.

Methods

Study Design and Ethical Considerations

A blind, cross-sectional study was conducted. One physiotherapist was in charge of the recruitment of participants and diagnosis of TMD, as well as the evaluation of pain intensity and the determination of the pressure pain threshold. Another physiotherapist was in charge of evaluating the severity of TMD with the use of the FAI. A third researcher was in charge of data processing and analysis. Volunteers were recruited from communities in the city of São Paulo (SP, Brazil) through verbal invitations as well as dissemination of information through flyers, the radio, and the Internet. All participants signed a statement of informed consent. This study received approval from the Nove de Julho University institutional review board (number 18032013.4.0000.5511).

Sample

The sample size was determined with the aid of the Ene program, version 3.0 (Autonomous University of Barcelona, Barcelona, Spain) and was calculated on the basis of the findings of a study by Zou et al.[15] The detection of a moderate association (r = 0.50) among the variables was considered for calculation of the sample size. Considering an 80% statistical power and 5% alpha, a minimum requirement of 30 volunteers was determined, and the number was doubled to 60 to increase statistical power.

Table 1. *Diagnosis of Temporomandibular Disorder of 60 Patients Analyzed on the Basis of RDC/TMD*

Diagnosis	Number
Ia	39
Ib	21
IIa	25
IIb	15
IIc	6
IIIa	13
IIIb	0
IIIc	0

Ia, myofascial pain; *Ib,* myofascial pain with limited opening; *IIa,* disk displacement with reduction; *IIb,* disk displacement without reduction; *IIc,* disk displacement without reduction without limited opening; *IIIa,* arthralgia; *IIIb:* osteoarthritis; *IIIc,* osteoarthrosis; *RDC/TMD*, Research Diagnostic Criteria for Temporomandibular Disorders.

Using the RDC/TMD,[9] female participants with a diagnosis of either myofascial pain (Ia) or myofascial pain with limited mouth opening (Ib) and pain and/or fatigue in the masticatory muscles during functional activities for a period of more than 6 months were included in the study. Individuals with diagnoses concurrent with that of myofascial pain, such as disk displacement and/or arthralgia, were also included (Table 1). The following were the exclusion criteria: age less than 18 years or more than 40 years; current orthodontic, physiotherapeutic, or medical (analgesic, anti-inflammatory agent, or muscle relaxant) treatment; missing teeth or use of complete/partial dentures; occlusal splint use; history of trauma to the face or to the TMJ; history of luxation or subluxation of the TMJ; and a diagnosis of either osteoarthritis (IIIb) or osteoarthrosis (IIIc) with the use of the RDC/TMD.[16]

Fonseca Anamnestic Index

The FAI was developed in Portuguese by Fonseca[17] for the evaluation of severity of TMD. This index is composed of 10 questions, each with 3 response options: "yes" (10 points), "sometimes" (5 points), and "no" (0 points).[18,19] Thus, the total score (sum of the points of all questions) allows for classification of TMD severity: 0 to 15 points = absence of TMD; 20 to 45 points = mild TMD; 50 to 65 points = moderate TMD; and 70 to 100 points = severe TMD. Only volunteers with TMD (score of 20-100 points) were included in the present study.

Visual Analogue Scale

The VAS is widely employed for the quantification of pain intensity and consists of a 100-mm line with "no pain" printed at 1 end and "worst pain imaginable" printed at the other end.[20] The volunteers in our study were instructed to mark a perpendicular line between the 2 extremes to represent their pain intensity at the time of evaluation.

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