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PREVENTION & REHABILITATION: CROSS SECTIONAL STUDY

Correlation between severity of temporomandibular disorder and mandibular range of motion

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Summary The aim of the present study was to determine the association between the severity of temporomandibular disorder (TMD) and mandibular range of motion (ROM). For such, a cross-sectional study was carried out with a sample of 92 women from the university community. The Fonseca's anamnestic index (FAI) was used to determine the severity of TMD, as follows: without TMD ($n = 23$), mild TMD ($n = 23$), moderate TMD ($n = 23$), and severe TMD ($n = 23$). Mouth opening, lateral excursion and protrusion of the mandible were measured. Spearman's correlation coefficients were calculated to determine the association between the FAI and mandibular ROM. Comparisons among groups were performed using the Kruskal–Wallis test with Dunn's post hoc test. No significant associations were found between TMD severity based on the classification of the FAI and ROM of functional mouth opening ($rs = -0.001$, $p = 0.987$), maximum active mouth

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opening (rs = −0.023, $p = 0.822$), passive mouth opening (rs = −0.026, $p = 0.803$), left lateral excursion (rs = 0.125, $p = 0.231$), right lateral excursion (rs = 0.087, $p = 0.406$) or protrusion (rs = −0.148, $p = 0.157$). Moreover, no statistically significant differences among severity groups were found ($p > 0.05$). Based on the findings of the present study, the severity of signs and symptoms of TMD was not associaed with mandibular range of motion.

Introduction

Temporomandibular disorder (TMD) is a disease that can affect different structures of the stomatognathic system, such as the masticatory muscles, temporomandibular joint (TMJ) and joint disc (Leeuw, 2008). The most common signs and symptoms of TMD are muscle and/or joint pain, joint sounds, muscle hyperactivity, lack of motor coordination and restricted joint movement (Peck et al., 2008; Manfredini et al., 2011).

Range of motion (ROM) within the limits of normality is an important sign of the proper function of a joint. Thus, the performance of the stomatognathic system is directly related to the mobility of the TMJ (Bonjardim et al., 2004; Sousa et al., 2008). Muscle pain, muscle spasms, joint pain and/or displacement of the joint disc commonly contribute to restricted mandibular ROM (Dworkin and LeResche, 1992; Look et al., 2010; Manfredini et al., 2011).

The diagnosis of TMD is a complex process due to the different anatomic structures that may be involved (Leeuw, 2008; Visscher et al., 2009; Hegarty and Zakrzewska, 2011). A number of assessment tools have been proposed for use in clinical practice and research involving individuals with TMD, such as the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), radiography, magnetic resonance imaging, computed tomography, infrared thermography and electromyography (Dworkin and LeResche, 1992; Rodrigues-Bigaton et al., 2008; Look et al., 2010; Costa et al., 2013).

The severity of TMD is also analyzed. For such, the Fonseca's anamnestic index (FAI) has been widely employed in clinical and epidemiological studies (Bevilaqua-Grossi et al., 2006; Oliveira et al., 2006; Pedroni et al., 2006; Nomura et al., 2007; Bonjardim et al., 2009). This assessment tool was developed in Portuguese and based on the Helkimo Index (Fonseca et al., 1994; Chaves et al., 2008). However, the literature has not yet established possible correlations between the severity and physical aspects of TMD commonly assessed in clinical practice, such as joint mobility.

The aim of the present study was to determine the association between the severity of TMD and mandibular ROM. The hypothesis is that a negative correlation between these variables will be found, i.e., reduced values of mandibular ROM are associated with high scores on the FAI.

Methods

Ethical considerations

The procedures of this study received approval from the Human Research Ethics Committee of Nove de Julho University, São Paulo, Brazil (protocol n° 364,287/2010). Each volunteer agreed to participate by signing a statement of informed consent.

Study design

A blind cross-sectional study was carried out, in which one physiotherapist administered the FAI, another performed the measures of mandibular ROM and a third researcher was in charge of the data processing and analysis.

Sample

Ninety-eight female volunteers aged 18—40 years were recruited from the university community of the city of São Paulo (SP, Brazil). The following were the exclusion criteria: missing teeth (except third molars), open bite, overbite, crossbite, use of partial or total dentures, use of orthodontic appliance, history of trauma to the face or TMJ, systemic disease (arthritis, arthrosis or neuromuscular condition) and physiotherapeutic, dental or medicinal (analgesic, anti-inflammatory agent or muscle relaxant) treatment. The application of the eligibility criteria led to the loss of six volunteers: five who were in orthodontic treatment and one with a history of facial trauma. Thus, the final sample was made up of 92 women.

Only women were included due to the higher prevalence of TMD in this gender (Oliveira et al., 2006).

Fonseca's anamnestic index (FAI)

The FAI was used to assess the severity of signs and symptoms of TMD. This is one of the few assessment tools designed in Portuguese for this purpose. The questionnaire is made up of ten items with responses of "yes" (10 points), "sometimes" (5 points) and "no" (0 points). The sum of the points allows the classification of the severity of TMD: 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) (Fonseca et al., 1994; Bevilaqua-Grossi et al., 2006; Chaves et al., 2008). Table 1 displays the English language version of the items on this questionnaire (Campos et al., 2009). The volunteers were instructed on how to fill out the questionnaire, which was answered individually in a well-lit, air-conditioned room with no time constraints.

Mandibular range of motion

For the joint flexibility exam, the volunteers remained seated in a chair with the trunk erect, back completely