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ARTICLE

Prevalence of temporomandibular disorders symptoms in patients with multiple sclerosis

Prevalência de sintomas de Disfunção Temporomandibular em pacientes com Esclerose múltipla

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ABSTRACT

The aim of the present study was to assess the prevalence of symptoms of temporomandibular disorders (TMD) in patients with the relapsing-remitting form of multiple sclerosis (MS), the relationship between TMD and the severity of MS, and the presence of TMD symptoms in the evaluated groups. Sixty individuals were evaluated: 30 patients diagnosed with relapsing-remitting MS and 30 control individuals matched for gender and age range with no neurologic pathology. In order to investigate the TMD symptoms, the questionnaires of the EACD (European Academy of Craniomandibular Disorders) and the RDC/TMD (Research Diagnostic Criteria for Temporomandibular Disorders), both validated for TMD research, were administered. To assess the extent of disability produced by MS, the Expanded Disability Status Scale (EDSS) was used. The prevalence of TMD symptoms in patients with MS was 56.7% versus 16.7% for the control group, with a statistically significant difference between the groups (p=0.0016). No correlation was found between the severity of MS and the prevalence of TMD symptoms (Fisher's test, p=1.0).

Keywords: temporomandibular disorders, multiple sclerosis, oral manifestations.

RESUMO

O objetivo deste estudo foi pesquisar a prevalência de sintomas de disfunção temporomandibular (DTM) em pacientes com esclerose múltipla (EM) na forma remitente-recorrente e sua relação com o grau de acometimento da doença e a presença de sintomas de DTM entre os grupos avaliados. Foram avaliados 60 indivíduos, sendo 30 com diagnóstico de EM e 30 controles pareados em gênero e faixa etária. Para avaliação de sintomas de DTM, foi aplicado o questionário recomendado aos clínicos pela Academia Europeia das Desordens Craniomandibulares . Para avaliação do nível de acometimento da EM foi utilizada a escala EDSS (*Expanded Disability Status Scale*). Os resultados da pesquisa mostraram que a prevalência de sintomas de DTM em pacientes com EM foi de 56,7% e 16,7% para o controle, havendo diferença estatística significativa entre os grupos. Não houve correlação entre o nível de acometimento pela EM e a prevalência de sintomas de DTM.

Palavras-chave: disfunção temporomandibular, esclerose múltipla, manifestações orais.

Multiple sclerosis (MS) is a chronic, progressive, inflammatory, disabling, autoimmune disease affecting the central nervous system. The etiology of MS is unknown; however, environmental and genetic factors have been pointed as predisposing factors[1]. One feature of the disease is the attack on the myelin sheaths surrounding the axons, which causes numerous lesions at various locations throughout the CNS. The topography of the lesions will determine the patient's clinical presentation, which may vary from visual disturbances resulting from optic nerve injury to the loss of motor coordination from cerebellar involvement[2].

Temporomandibular disorders (TMD) comprises an array of signs and symptoms causing functional alterations in the temporomandibular joint (TMJ), masticatory muscles and related structures. Prominent signs and symptoms are pain, joint sounds, and irregular or impaired mandibular function[3,4,5,6]. The etiology of TMD is multifactorial; the most frequently reported risk factors are depression, occlusal alterations, pain in other parts of the body, parafunctions, emotional and physical trauma, microtraumas to the teeth, joint hypermobility, dental treatments demanding extensive chair time, and somatoform disorder[5,6,7,8,9,10,11,12,13].

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Epidemiological studies show that between 33% and 86% of the world population exhibit at least one sign of TMD, and 16% to 59% have at least one symptom[6,14,15]. Females and young adults (35-45 years of age) are affected more frequently; the disease is rare in the elderly[3,5,11,16]. The most widely used diagnostic tool for TMD, regarded as the most reliable method, is the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), which was designed by Dworkin and LeResche in 1992[17]. The RDC/TMD is a set of diagnostic criteria in TMD research based on clinical (Axis I) and psychological (Axis II) assessments. In 2007, de Boever et al.[18], representing the European Academy of Craniomandibular Disorders (EACD), conceived a four-item questionnaire to detect symptoms of TMD, exclusively. Thus, the examinee who responded affirmatively to any of the questions would be further assessed for TMD. This instrument has since been used as an effective screening tool for patients reporting TMD symptoms.

It has been hypothesized that the proprioceptive alterations and cerebellar ataxia in MS might lead to increased propensity to fatigue of the structures associated with the temporomandibular joint and lack of coordination of mandibular movements. This contributes to the appearance of symptoms of TMD. The aim of the present study was to assess the prevalence of TMD symptoms in individuals with the relapsing-remitting form of MS compared with a control group, and examine the relationship between those symptoms and the extent of disability of patients with MS expanded disability status scale (EDSS), as well as the presence of those symptoms.

METHOD

Following approval of the study by the research ethics committee of the Fluminense Federal University, two groups comprising a total sample of 60 individuals were evaluated between June 2012 and January 2013. The sample size was not statistically estimated, as it was a convenience sample on the basis of the flow of patients at the neurology clinic of the *Hospital Universitário Antonio Pedro, Universidade Federal Fluminense* (APUH-FFU).

The first group comprised 30 consecutive male and female individuals aged between 18 and 80 years, diagnosed with MS by the McDonald criteria as revised by Polman et al.[19], in the relapsing-remitting form, with any EDSS rating, who were receiving regular medical treatment at the APUH-FFU neurology clinic and gave their informed consent.

The control group (CG) consisted of 30 healthy individuals. Caregivers and family members of the MS group (MSG) participants who had no MS or any neurologic disease, matched for gender and age range, were also included, provided that they gave their informed consent. Individuals of both groups who showed inadequate cognitive function were excluded.

The study was conducted in individual sessions, during which the demographic information of each participant was recorded on a chart. The data concerning MS and neurologic involvement as rated by the EDSS[20] were verified by a minimum of two neurologists in charge of the clinic. The study participants were classified according to their EDSS rating; a score from 0 to 4.5 corresponded to mild to moderate disability, while a score between 5.0 and 9.5 was regarded as severe inability to perform simple daily activities[21].

Two strategies were used to identify TMD symptoms: a four-question questionnaire recommended by the European Academy of Craniomandibular Disorders[18] for symptom assessment only, and the diagnostic criteria of the RDC/TMD (Research Diagnostic Criteria for Temporomandibular Disorders)[17] for TMD symptoms, diagnosis and classification. The latter is divided into Axis I for the clinical assessment of the TMD, and Axis II for psychological evaluation. Axis I was selected for the present study, since the purpose was solely to assess the occurrence of TMD symptoms. The assessment of the TMD symptoms was entirely performed by the author of the present study, who has a background in dentistry and is specialized in temporomandibular disorders.

The statistical analysis was performed using the software BioEstat "Statistical Applications in the Fields of Biological and Medical Sciences" of the *Universidade Federal do Pará*, Federal University of Para, Brazil, version 5.0 (2007), as the sample fulfills the requirements for a nonparametric analysis, errors with normal distribution and homogeneity of variances. Fisher's exact test was used in the analysis of 2x2 contingency tables in order to compare two nonparametric groups. This test is employed when the two independent samples are small, and involves determining the exact probability of obtaining an observed frequency, or more extreme values. Student's *t*-test was used in the comparison of the means for the two normal distributions, assuming that they refer to the same population, only at two distinct timepoints. The level of significance was set at $p \leq 0.05$, i.e., a 95% confidence level.

RESULTS

The sample distribution according to gender comprised 20 females (66.7%) and 10 males (33.3%) in both groups. The age of the MSG and CG individuals ranged from 25 to 60 years, with a mean of 42.8±9.6 years for the MSG, and 41.8±11.2 years for the CG. There was no statistically significant difference between the groups in this respect (*t*-test, p=0.11).

Table 1. Distribution of the individuals according to TMD symptoms.

EDSS	TMD symptoms	No TMD symptoms	Total	Fisher's test (*p*)
1.0–4.5	15–68.2%	7–31.8%	22–73.3%	1.0
5.0-10	2–25%	6–75%	8–26.7%	
Total	17	13	30	

EDSS: expanded disability status scale; TMD: temporomandibular disorders.

Symptoms were more frequent in the MSG than in the CG (56.7% versus 16.7%, respectively). The difference between the groups was statistically significant (Fisher's exact test, p=0.0016). The individuals who had symptoms of TMD are shown in Table 1. The reported symptoms were pain during mandibular movement (10% in the MSG versus 3.3% in the CG); pain in the face, temples, TMJ or maxilla (40% MSG versus 6.7% CG); closed lock (20% MSG versus 0% CG), and headache (43.3% MSG versus 16.7% CG).

Of the patients with MS, 73.3% (22 patients) had an EDSS score between 1.0 and 4.5, 68.2% of whom (15 patients) reported TMD symptoms. On the other hand, 26.7% (8 patients) were more severely afflicted (EDSS score greater than 5.0), and 25% of these (2 patients) had TMD symptoms (Table 2). There was no statistically significant association between the extent of MS disability by the EDSS rating and the symptoms of TMD (Fisher's test, p=1.0). Therefore, the severity of MS was not proportional to the symptoms of TMD found in this group.

DISCUSSION

The groups in the present study were matched for age range and gender; the mean age was approximately 42.8 years, and females comprised 66.7% of the total sample. This is in agreement with the literature[22,23,24,25,26], which notes a higher frequency of TMD and MS in young adults and a predilection for females.

In the present study, TMD symptoms were present in 56.7% of the MSG patients and in only 16.7% of the CG. The symptoms were pain during mandibular movement (10% for the MSG versus 3.3% for the CG), pain in the face, temples, TMJ, or maxilla (40% MS versus 6.7% CG), closed lock (20% MSG versus 0% CG) and headache (43.3% MSG versus 16.7% CG). The severity of MS was not proportional to the symptoms of TMD found in this group.

Table 2. TMD symptoms in the MSG relative to the extent of disability by the EDSS.

TMD symptoms	MSG	CG	Fisher's test (*p*)
Yes	17 (56.7%)	5 (16.7%)	0.0016*
No	13 (43.3%)	25 (83.3%)	
Total	30	30	

EDSS: expanded disability status scale; TMD: temporomandibular disorders; MSG: multiple sclerosis group; CG: control group.

Among the studies assessing the presence of TMD symptoms in patients with MS, that of Tweedle et al.[27] and the one by Badel et al.[28] simply reported a clinical case. However, Badel et al. reviewed the literature and pointed to loss of motor coordination, psychological problems, and greater propensity to muscle fatigue of the patients with MS to account for the higher frequency of TMD in these individuals.

Symons et al.[22] evaluated 22 patients with MS through history taking and physical examination. In addition to recruiting a reduced group of patients, no control group was constituted, and no standardized study method for TMD was used. Those authors found at least one symptom of TMD in 40.9 % of the patients; all of these reported TMJ and masticatory muscle pain, while 31.8% had pain during mandibular movements.

Kovac et al.[25] examined a larger group, with 50 MS patients and 50 control individuals, and used the RDC/TMD to investigate TMD. In the MSG, 82% had TMD symptoms versus 24% in the CG. Those authors considered joint sounds to be symptoms, which was not the case of the present study. This explains the difference found between the two studies, since 30% of the patients with MS and 10% of the CG had joint sounds. However, the authors of that study failed to inform the number of individuals who reported joint sounds and other symptoms and those who only had joint sounds, which makes it difficult to establish the correct percentage of the evaluated symptoms. Of the symptoms reported, 54% individuals had facial and mandibular joint pain compared with 10% in the CG; pain during mandibular movements was noted in 22% of the MSG versus 4% in the CG, and closed lock was found in 22% of the MSG patients versus 0% in the CG. Those authors concluded that MS is a risk factor for disorders in the TMJ and masticatory muscles, and highlighted the important role of dental follow-up for those patients.

The present study involved a smaller number of individuals (30 patients with MS and 30 controls) than that of Kovac et al[25]. This can be explained by the difficulty in finding patients with this disease in Brazil, since its prevalence is very low compared with northern hemisphere countries.

Both the RDC/TMD, Axis I, and the EACD questionnaire were used to identify TMD symptoms, while the EDSS was employed in the assessment of MS-related disability. The

EACD questionnaire and the EDSS have not been used in any other study.

The shortcomings of the present study were the sample size, the assessment of TMD symptoms only, and the lack of patient follow-up.

A more thorough analysis of the EDSS score of each functional system which established a relationship between that score and the presence of TMD could be more enlightening. In addition, recruiting a larger sample would allow for more robust findings; the inclusion of other control groups such as patients with the primary progressive or secondary progressive form of MS would also enable important conclusions on this subject.

Based on the above results, greater prevalence of TMD symptoms was found in patients with MS, with a statistically significant difference between the groups (p=0.0016).

Regarding the disability produced by MS as measured by the EDSS, there was no correlation between the presence of TMD symptoms and the extent of disability of the patients with MS (p=1.0).

Because the etiology of both diseases is still unclear, further studies are needed to better understand them and establish a relationship between these two conditions. Multiprofessional assistance is of paramount importance to these patients to enable improved quality of life.

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