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Original research article

Different association between specific manifestations of bruxism and temporomandibular disorder pain

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ARTICLE INFO

Article history:

Received 1 May 2016

Accepted 31 August 2016

Available online xxx

Keywords:

Bruxism

Sleep bruxism

Temporomandibular disorders

Facial pain

Muscle pain

ABSTRACT

Introduction: A growing body of evidence suggests that bruxism exists in two separate manifestations. However, little is known about the association between specific manifestations of bruxism and temporomandibular disorder (TMD) pain.

Aim: The aim of our study was to analyze the association between TMD pain and specific diagnoses of bruxism (sleep, awake, and mixed diagnosis of sleep and awake bruxism).

Material and methods: 508 adult patients (296 women and 212 men), aged between 18 and 64 years (mean age 34 ± 12 years), attending to a clinic for general dental treatment. Patients were asked to fill an anonymous questionnaire, consisting of three questions, verifying the presence of TMD pain and two forms of bruxism. All questions were based on the Polish version of the Research Diagnostic Criteria for Temporomandibular Disorders patient history questionnaire. Cross tabulation was done, and χ^2 was used as a test of significance to find the association between the variables.

Results: Awake bruxism was associated with TMD pain only in men ($\chi^2 = 7.746$, $p < 0.05$) while mixed diagnosis of bruxism was associated with TMD pain in both women ($\chi^2 = 10.486$, $p < 0.05$) and men ($\chi^2 = 4.314$, $p < 0.05$). There was no statistically significant association between sleep bruxism and TMD pain. Gender-related differences in the presence of all bruxism diagnoses were also statistically insignificant.

Conclusions: Interaction between sleep and awake bruxism may increase the risk for TMD pain. We suggest considering concomitance as a confounder, when studying sleep or awake bruxism.

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<http://dx.doi.org/10.1016/j.pjnns.2016.08.008>

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1. Introduction

Bruxism is a common disorder defined as a repetitive jaw muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible [1]. Two distinct manifestations of this disorder are distinguished – sleep and awake. The term awake bruxism refers to the clenching of teeth and jaws during wakefulness. Sleep bruxism defined as clenching or grinding of teeth during sleep is classified as a sleep-related movement disorder that occurs as a response to micro-arousals during sleep [2]. Bruxism during wakefulness is commonly characterized by a clenching-type activity while sleep bruxism by a combination of clenching and grinding-type activity [3]. The etiology of both disorders is unknown. However, several risk factors have been identified. Studies showed that awake bruxism is linked to psychological factors, such as stress and anxiety [3], while sleep bruxism is associated with the consumption of alcohol, tobacco, coffee and use of certain drugs [4–6]. Considering significant differences between these two forms, it is crucial to discriminate between them at the etiologic, diagnostic, and therapeutic levels [3].

Clinical relevance of bruxism is related to its detrimental influence on the masticatory system. Except dental problems, such as tooth wear, tooth mobility and abfraction, bruxism is considered one of the major etiological factors of temporomandibular disorders (TMD). Accordingly, bruxism is diagnosed more frequently in TMD patients than in the general population [7]. The link between bruxism and TMD was investigated in many studies, showing that bruxism is associated predominantly with muscle conditions [8]. However, this activity is also attributed to temporomandibular joint disorders, such as disk displacement, adhesions, and capsulitis [9,10].

Bruxism as a whole is positively correlated with the presence of TMD pain [8]. However, little is known about the role of its specific forms in the etiology of painful TMD. It is suggested that awake and sleep bruxism are differently associated with TMD pain [11]. It is worth noting that most of the studies investigating this relationship did not rule out the presence of non-investigated form in the studied groups [8]. In our opinion, lack of such exclusion could have affected the outcomes because the presence of pain could have been caused by a concomitant form of bruxism.

For these reasons, the aim of our study was to analyze the association between the presence of TMD pain and specific diagnoses of bruxism (only sleep, only awake, mixed diagnosis of sleep and awake bruxism). The results were aimed to show how these different entities attribute to the incidence of TMD pain.

2. Material and methods

2.1. Study group

Five hundred and eight adult patients (296 women and 212 men), aged between 18 and 64 years (mean age 34 ± 12 years), attending to a dental clinic for general dental treatment. Detailed characteristic of the group is presented in Table 1.

Table 1 – General characteristic of the study group (n = 508).

	n	%
Education		
Elementary	14	2.8
Lower secondary	6	1.2
Secondary	212	41.7
Higher	265	52.2
Other	11	2.2
Place of residence		
Village	89	17.5
Town up to 10,000 citizens	42	8.3
City 10,000–500,000 citizens	72	14.2
City above 50,000 citizens	305	60.0
Age		
18–34 years	318	62.6
35–44 years	66	13.0
45–64 years	124	24.4

2.2. TMD pain self-report and diagnoses of bruxism

Patients were asked to fill an anonymous questionnaire, consisting of three questions, verifying the presence of TMD pain and two forms of bruxism. All questions were based on the Polish version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) patient history questionnaire [12]. The presence of TMD pain was assessed using the question “Have you had pain in the face, jaw, temple, in front of the ear or in the ear in the past month.” The diagnoses of sleep and awake bruxism were obtained by self-report in answers of questions “Have you been told, or do you notice that you grind your teeth or clench your jaw while sleeping at night?” and “During the day, do you grind your teeth or clench your jaw?” respectively. Patients who answered positively only to one question were diagnosed with sleep or awake bruxism, depending the given answer. Patients who gave two positive answers were diagnosed with mixed sleep and awake bruxism. The term mixed bruxism will be used further in the text in reference to this diagnosis.

2.3. Statistical analysis

Cross tabulation of studied variables was done, and χ^2 was used as a test of significance to find the association between the presence of TMD pain and specific diagnoses of bruxism. Statistical analysis of sex differences was done using the χ^2 test. The level of significance was set at $p < 0.05$. Data were analyzed using IBM SPSS Statistics Version 20 software.

3. Results

We found a statistically significant association between the presence of TMD pain and the diagnoses of mixed and awake bruxism. Awake bruxism was associated with TMD pain only in men ($\chi^2 = 7.746$, $p < 0.05$) while mixed bruxism was associated with TMD pain in both women ($\chi^2 = 10.486$, $p < 0.05$) and men ($\chi^2 = 4.314$, $p < 0.05$). There was no statistically significant association between sleep bruxism and TMD

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