

# The Role of Psycho-Emotional Tension and Stress in the Etiology of Bruxism

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## Summary

*The cause of bruxism is still unknown. The most commonly referred factor in the etiology of bruxism is that of psychogenic origin. This study was an attempt to evaluate the role of stress, psycho-emotional tension and anxiety in the etiology of bruxism. The aim was also to determine a connection between certain psychosomatic symptoms and bruxism. The analysis showed statistically significant difference ( $p < 0.02$ ) in the results of the anxiety and stress test between the bruxism group and the control group. It was concluded that there is a higher level of psychoemotional tension, stress and anxiety in patients with bruxism. Higher frequency of psychosomatic symptoms (tachycardia, palpitation) was also present in the group with bruxism than in the control group ( $p < 0.01$ ). These results point out the importance of certain psychosomatic factors in the etiology of bruxism.*

Key words: *bruxism, etiology, stress, psychosomatic disorders.*

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## Introduction

The cause of bruxism is still controversial. Etiology is probably composed of many factors which overlap. This in reality creates great difficulties in the preparation of an effective treatment plan (1).

At the beginning of the last century it was thought (1, 2) that the gnashing of teeth is the co-effect of occlusive interferences and psychological factors (2). Since that time, all studies put emphasis on one of two etiological factors (3-14).

When considering the causes, we have to take notice of the potentiating effect of alcohol (15), tobacco (16), some medications (fenfluramin, levodopa) (17, 18) and amphetamine (19), malnutrition (20), genetic factors (21, 22), CNS disorders (23), and Ploceniak's theory of atypical tetany due to the shortage of magnesium (24). The connection between

bruxism and some sleep-disorders (e.g. sleep apnea) is also very significant (25).

The aim of this research study was:

- to compare the levels of anxiety and stress in the group with diagnosed bruxism to levels of anxiety and stress in the control group
- to estimate the share of general (compensated) anxiety and susceptibility to everyday stress in the etiology of bruxism with patients without psychiatric problems
- to estimate the importance of the presence of some psychosomatic symptoms (tachycardia, palpitations, gastrointestinal problems) in the case history of bruxism patients and compare the collected data with the results gathered in the control group
- to estimate the prevalence of particular symptoms of bruxism in the group of patients diagnosed with bruxism and express the results as a percentage.

## Participants and procedures

The group of patients on which the research was carried out consisted of ten participants who met the criteria established in the American Sleep Disorder Association (ASDA) (26) definition of bruxism. The participants were patients of the Clinical Department of Prosthetic Dentistry of the Clinical Hospital Centre Zagreb and a private dental practice. The group consisted of seven women and three men, aged between 17 and 53. Half of the participants had university education, four had secondary education and one participant was still in high-school. One participant had a smoking habit and two consumed alcohol moderately. Seven participants received night relaxation splint treatment for a duration of from several months to a year. None of the participants had any diagnosed psychiatric illnesses and the symptoms of bruxism were constantly present. The control group consisted of eight female and two male students of the School of Dental Medicine, University of Zagreb (aged between 23 and 26) with no symptoms of bruxism given in the ASDA definition (26), which was confirmed by their case records. None of the control group had any psychiatric disorders. Seven participants smoked habitually and four consumed alcohol in small quantities. The research study consisted of two parts. In the first part of the study case records of the participants from both groups were compiled and the participants from the group diagnosed with bruxism underwent a screening examination. In the second part of the study both groups answered the questions from the general anxiety and stress susceptibility test (Figure 1) which was made up and evaluated with the help of a psychiatrist.

The data in the case records of both groups included general information (age, sex, occupation, information on smoking habits and alcohol consumption). In the medical part of the case records we asked whether the patients were aware of bruxism and whether they had received any treatment for their condition (if they had bruxism) and whether their families had any such difficulties. The final set of questions referred to difficulties such as headaches, changes in masticatory muscles and temporomandibular joints, higher sensitivity of the teeth).

Clinical examination consisted of an inspection with a dental probe and mirror, palpation (tem-

poromandibular joints and masticatory muscles) and TMJ auscultation. It also included data on the teeth (hypersensitivity, fractures, mobility, and loss of vertical dimension, grinding facets), occlusion (class, occlusive interferences), masticatory muscle system (tension, pain, hypertrophy), temporomandibular joints (clicking, crepitus) and possible difficulties in opening the mouth. Thus, the basic diagnosis of bruxism was made by juxtaposing the above mentioned criteria of the definition (ASDA) with the results of the clinical screening examinations and the data from the case records.

Both groups were interviewed. The questionnaire consisted of 21 questions with 6 offered answers which were the same for every question. The answers were:

- a) almost never
- b) rarely
- c) sometimes
- d) often
- e) most of the time

Depending on the way the question was formulated (Figure 1), answers under a) and e) scored 0 or 5 points, while the answers under b), c), and d) scored 1, 2 and 4 or 4, 2, and 1 points, also depending on the form of the question. Questions 12, 13, 14, 16, 18, 19 and 20 because of their greater importance, scored extra points so that the answers a) or e) (again depending on the question) scored an extra 2 points, and answers b) or d) scored one extra point.

Student's t-test for independent samples for totals on the anxiety scale and the score on items 12 and 13 of the scale was used to compare the results of the bruxism and the control group.

## Results

The data from the group with diagnosed bruxism and the control group were compiled and analyzed.

- I. The results of the anxiety and stress susceptibility test (21 questions, see Figure 1) of the group diagnosed with bruxism were compared to the results of an identical test carried out in the control group. Answers to the questions referring to some psychosomatic symptoms, gastrointestinal difficulties (question 12) and

palpitation/tachycardia/ arrhythmia (question 13) were evaluated and compared separately.

II. Prevalence of particular clinical symptoms of bruxism with bruxic participants was expressed as a percentage.

Table 1 indicates that there is statistically significant difference ( $p < 0.02$ ) between the scores in the anxiety and stress susceptibility test of the bruxism group and the control group. There is also a statistically significant difference between bruxism and the control group's scores to question 13 ( $p < 0.01$ ). There is no statistically significant difference in question 12. The distribution is presented graphically on the anxiety scale together with the distribution of the relative prevalence of different answers on individual items 12 and 13 in both groups (Figures 2-4).

Ninety per cent of the participants have experienced some changes in their teeth. Seventy per cent have experienced loss of the vertical dimension and grinding facets. Eighty per cent of the participants feel morning tension of masticatory muscles and forty per cent feel pain. Functional changes in temporomandibular joint (clicking, crepitations) were noted in 60% of the participants.

## Discussion

Occlusive factors are not considered as important in the development of bruxism as they used to be (7, 8). Karoly's classic hypothesis (27) on the co-effect of occlusive interferences and psychological factors that was present in various forms in the scientific writings of the last century is thus losing ground. Occlusive interferences are less and less cited as the fundamental etiological factor and the term trigger effect is used more and more often when evaluating their role in etiology. As the 'occlusive' part of the dual etiological hypothesis is being gradually discarded, psychological causes (12-14), or the second basic factor in the development of bruxism, is gaining more importance in the last decades.

This study predicts, based on research in the etiology of bruxism conducted so far, that the level of anxiety, psycho-emotional tension and stress will be higher in the group consisting of diagnosed brux-

ers than in the control group. Statistically significant difference ( $p < 0.02$ ) was found between the participants with bruxism and the control group which clearly shows that everyday stress and anxiety are an important factor in the development of bruxism. We should point out that the test is very general in its formulation and structure and that its aim was to estimate the reactions and habits of mentally healthy participants and compare them to those of the control group. Although it was confirmed that everyday stress and general compensated anxiety have an important influence on the development and precipitation of parafunctional activities, one must take into consideration that some participants diagnosed with bruxism ( $\sigma = 21.45$ ) have a lower level of stress and anxiety than some participants from the control group. This points to another important etiological factor. It is still not clear if it is really occlusion, genetic factors or something else. In most cases of bruxism (especially in women) there is a higher level of psycho-emotional tension, stress, and/or anxiety. However, it is still necessary to check other possible causes as well (because of the patients with bruxism and low level of anxiety and stress) so that the disorder can be fully understood and successfully treated.

Our research shows that there is a statistically relevant difference in the prevalence and intensity of tachycardia and palpitation between the participants with bruxism and the control group. There is a statistically significant difference ( $p < 0.01$ ) in scores and the prevalence of the above mentioned difficulties was higher in the group diagnosed with bruxism. No statistically relevant difference was found between the groups in respect to the question on possible gastrointestinal difficulties. ( $p < 0.05$ ). The considerable difference between the groups regarding tachycardia and palpitation should be more thoroughly studied on the bruxism and control group of corresponding (younger) age in order to exclude organic causes of tachycardia and palpitation. The fact that none of the participants with bruxism had received any treatment for those conditions corroborates the results of the research.

Clinical research conducted so far proves that patients with bruxism have a higher prevalence of various clinical symptoms (3, 5, 8, 9, 28). Evaluation of the clinical symptoms of bruxism has shown

that the most common signs are changes on teeth and muscles and functional interferences in the temporomandibular joint. The results of the research correlate to other research studies (3, 5, 8, 9, 28) and once again point to the necessity of devising an effective treatment of bruxism as well as resolving the etiology of bruxism which is an important condition for the creation of effective therapy.

### Conclusion

This research, carried out on a group of participants diagnosed with bruxism and a control group, showed a higher level of anxiety and psycho-emotional tension ( $p < 0.02$ ) as well as a higher prevalence of tachycardia and palpitation ( $p < 0.01$ ) in participants with bruxism than in the control group.

The results point to the importance of anxiety, psycho-emotional tension and stress in the etiology of bruxism.