STRESS-RELATED BRUXISM IN DENTAL MEDICINE STUDENTS

Elina Todorova
Medical University – Varna, Bulgaria, elly_todorova@abv.bg
Miroslav Stoykov
Medical University – Varna, Bulgaria, miroslav.stoikov93@gmail.com

Abstract: Authors define stress as a negative stimulus and a concomitant reaction that includes components of physiological and psychological type, affecting the normal functioning of the human being. Bruxism is a well-studied, parafunctional, repetitive activity of the mandible, during which patients unconsciously grind, gnash or clench with their teeth. When teeth are clenched, a static relation between the maxilla and the mandible is observed. When patients grind with their teeth, clinicians find dynamic maxillo-mandibular relationship. Bruxism is classified as awake and sleep, rhythmic and non-rhythmic, primary and secondary. Etiology of bruxism is multifactorial. Contributing factors for the condition are anxiety, depression and stress situations, malocclusions and interferences with occlusion, as well as pathophysiological, psychological and genetic determinants. Diagnosis of bruxism is done through patient's subjective report, clinical intraoral examination, the usage of trial dental splints (bruxing checkers), electrophysiological tools. Management of bruxism is not a straightforward task to complete, providing the fact that clinical practice lacks a solution which can permanently stop the condition. A variety of methods are known – medications prescription, dental occlusal splints and obstructive sleep apnea mandibular advancement devices (MADs) usage, psychological approaches, changing bad sleep habits and improving sleep hygiene, lowering or cessation of alcohol, tobacco and coffee consumption. Students of dental medicine, irrespective of the country they study in, especially those who are in their clinical cycle, participate in high demand situations that generate states of stress and anxiety. Teams of clinicians have studied the onset and consequences of bruxism in those clinical groups.
The aim of the following publication is to study the correlation between anxiety and stress in dental medicine students, the frequency of bruxism events, gender and age distribution.
In order to fulfil the aims of the study, a standard questionnaire (American Association of Sleep Medicine), related to bruxism symptoms, was distributed among dental medicine students. All participants signed written informed consent forms and underwent thorough intraoral analysis of occlusion. The results from the questionnaire were analyzed.
Stress is one of the main factors for bruxism and has shown a strong correlation with it. Careful and timely measures should be undertaken to alleviate the symptoms. Improper clinical approaches can cause temporomandibular disorders.
Keywords: bruxism, occlusal interferences, dental splints, grinding teeth

1. INTRODUCTION

Authors define stress as a negative stimulus and a concomitant reaction that includes components of physiological and psychological type, affecting the normal functioning of the human being. (7) There are four primary types of symptoms which describe stress: physical, emotional, cognitive and behavior. (12) There are stressful activities in the life of the students, especially those who study dental medicine. Sources of stress in students can be for instance changes in sleeping habits, an increase in the workload, financial pressures, newly arisen responsibilities and others. (15) Some studies deny the connection between chronobiology, circadian rhythms and bruxism. (13) Dental education poses high amounts of stress for the students. It comes with both theoretical and clinical challenges for them. (1) Stress during education can lead to mental distress and has a negative impact on cognitive functioning and learning. Students of dental medicine, irrespective of the country they study in, especially those who are in their clinical cycle, participate in high demand situations that generate states of stress and anxiety. Teams of clinicians have studied the onset and consequences of bruxism in those clinical groups. (1, 2, 4, 9, 13, 15)
In fact, in recent decades, in a number of studies in countries from the US, Europe, Asia the importance of stress for the dental students has been considered. (1, 2, 4, 9) These studies demonstrated the link between stress and bruxism in students as bruxism is stated to be one of the main physical symptoms of stress. (1, 2, 4, 9, 13, 15)
Emotional stress is the main triggering factor for bruxism. It is a well-studied, parafunctional, repetitive activity of the mandible or an oral habit, during which patients unconsciously and involuntary grind, gnash or clench with their teeth. Those movements of the lower jaw can cause occlusal trauma. When teeth are clenched, a static relation between the maxilla and the mandible is observed. When patients grind with their teeth, clinicians find dynamic maxillo-mandibular relationship. Bruxism is classified as awake and sleep, rhythmic and non-rhythmic, primary and secondary. Bruxism that occurs during daytime is in most cases a semivoluntary "clenching" activity and is also

known in the scientific literature as "Awake or Diurnal Bruxism" (AB, DB). (6, 7) AB can be caused by a variety of factors, most often of which are the different responsibilities in the family life and pressure at the work place. Bruxism activity when the individual is asleep is known as "Sleep Bruxism" (SB). (6, 7) Authors define that activity as an "oromandibular behavior" during which stereotyped disordered movements occur, that consist of tooth grinding and/or clenching. It is a part of the sleep-related movement disorders. (6, 7)

Etiology of bruxism is multifactorial. (11, 12) The three main etiological factors for bruxism presentation are of occlusal, pathophysiological and psychological type. (3, 7, 14, 15) Contributing factors for the condition are anxiety, depression and stress situations, malocclusions and interferences with occlusion, as well as pathophysiological, psychological and genetic determinants. Occlusal factors include factors such as tooth interferences in the occlusion, while pathophysiological factors involve the release of specific brain neurotransmitters. (12) According to authors in the area, psychological factors such as anxiety and stress, which is common among students, lead to bruxism. (1)

Diagnosis of bruxism is done through patient's subjective report, clinical intraoral examination, the usage of trial dental splints (bruxing checkers), electrophysiological tools. (8) Management of bruxism is not a straightforward task to complete, providing the fact that clinical practice lacks a solution which can permanently stop the condition. (5) A variety of methods are known – medications prescription, dental occlusal splints and obstructive sleep apnea mandibular advancement devices (MADs) usage, psychological approaches, changing bad sleep habits and improving sleep hygiene, lowering or cessation of alcohol, tobacco and coffee consumption. (4, 5, 10)

In order to become a physician in dental medicine in Bulgaria, the student must follow a 6-year studies curriculum, divided into 2 main stages: 1 stage: the first, second and third years include the Pre-medical and pre-clinical studies that consist of theoretical and pratical "phantom" courses (e.g. biology, physics, pharmacology, anatomy, physiology, dental materials science, dental morphology, simulation courses in propaedeutics of prosthetic dental medicine, pediatric dentistry, conservative dentistry) with a focus on developing manuality – practicing on polymer teeth and extracted in invested in gypsum models real teeth for training skills for root canal treatment in conservative dentistry and endodontics; 2 stage – the fourth, fifth and sixth years mainly consist of developing clinical skills by performing treatment on real patients under the direct supervision of academic assistant professors with a degree in dental medicine (DMD) in prosthetic dentistry, periodontology and dental implantology, oral and maxillo-facial surgery, conservative dentistry and endodontics, pediatric dentistry, orthodontics. Sixth year is the period when students go through their pre-graduate internship, hold their state exams and graduate as physicians in dental medicine.

The aim of the following publication was to study the correlation between anxiety and stress in dental medicine students, the frequency of bruxism events, gender and age distribution.

2. MATERIALS AND METHODS

In order to fulfil the aims of the study, a cross-sectional study was conducted among dental students from different academic years. A standard questionnaire (American Association of Sleep Medicine; Winocur et al., 2010) (14), related to bruxism symptoms, was distributed among 46 adult dental medicine students via Google Forms. It was translated in Bulgarian by the team behind the study. All participants signed written informed consent forms and underwent thorough intraoral analysis of occlusion. The results from the questionnaire and the intraoral occlusion check-up were analyzed.

3. RESULTS

The questionnaire elicited information on the demographic characteristics (age, gender) and experience of grinding teeth during day and night time. On Diagram 1 and 2, gender and age distribution can be seen. (Diagram 1, Diagram 2) More female students took part in the study – 27 (58,7%), versus 19 male. (41,3%). Youngest student participant was 18 years of age, the oldest – 28. Mean age was 22,28.

Diagram 1 – Gender distribution of the participants

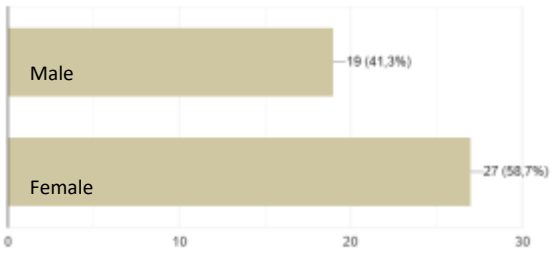
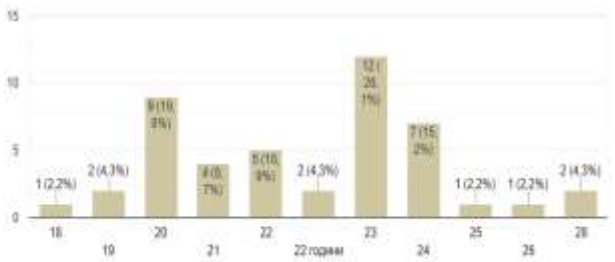


Diagram 2 – Age distribution of the participants



On the following Diagrams 3 and 4 respectively, it is shown in percentages, how many of the students responded to have experienced symptoms of Awake and Sleep bruxism during the last 6 months. 37 % of the respondents are affected by AB and 15 % by SB. (Diagram 3, Diagram 4)

Diagram 3 – Students affected by Awake bruxism (AB)

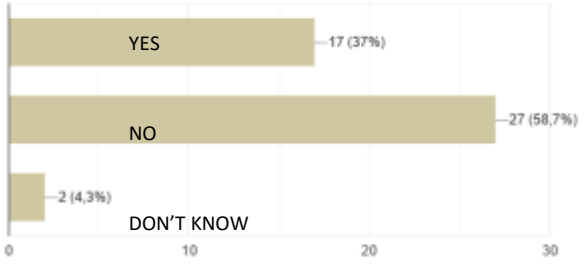
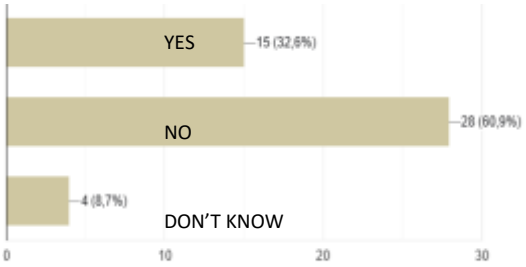
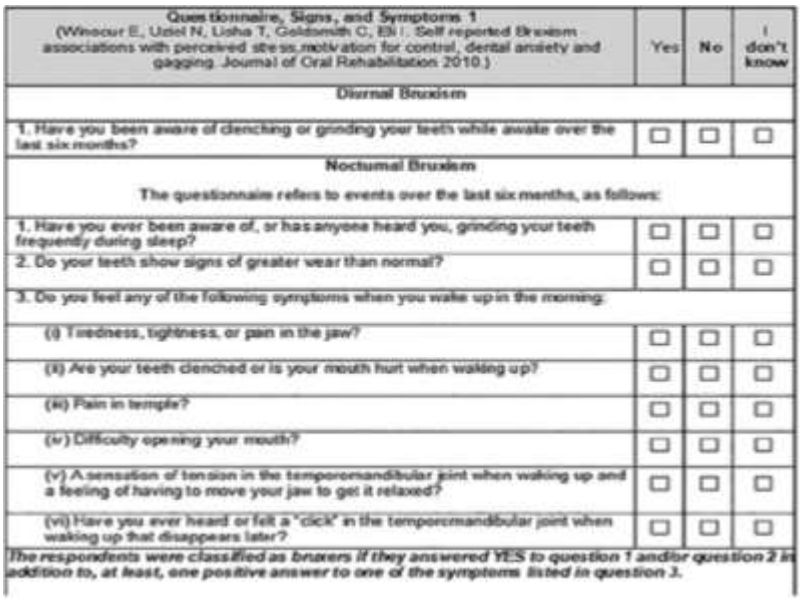


Diagram 4 – Students affected by Sleep bruxism (SB)



Based on the results from the survey, during the last 6 months, 8 students (17,4%) respond to have experienced greater wear of teeth, 33 (71,7%) respond negatively, 5 (10.9%) cannot determine. When asked if they have experienced tiredness, tightness or pain in the jaw after sleep, 15 (32.6%) respond positively, 29 (63%) – deny the presence of those symptoms. When waking up, 11 students (23.9%) respond that their jaws hurt, 34 (73,9%) – deny experiencing pain in the jaw. 9 individuals (19,6%) confirm that they have experienced pain in the temporal region, versus 37 (80,4%) – who have not. Only 2 students (4,3%) have experienced trouble opening mouth when getting up from sleep. 9 students (19,6%) have experienced tension in the temporomandibular joints (TMJs) and the need to move it in order to release the tension. 9 individuals (19,6%) responded that they have experienced clicking noises in the TMJs. In Table 1, the responses of the participants on all of the questions are shown.

Questions / Possible answers (information regarding the last 6 months)	**Yes**	**No**	**I don't know**
Clenching teeth during the day	17 (37%)	27 (58,7%)	2 (4,3%)
Grinding teeth while asleep	15 (32,6%)	28 (60,9%)	4 (8,7%)
Greater wear of the teeth	8 (17,4%)	33 (71,7%)	5 (10,9%)
Tiredness, tightness, pain in the lower jaw	15 (32,6%)	29 (63%)	3 (6,5%)
Teeth clenched when waking up, pain in the lower jaw	11 (23,9%)	34 (73,9%)	1 (2,2%)
Pain in the temporal region	9 (19,6%)	37 (80,4%)	0 (0%)
Trouble opening the mouth	2 (4,3%)	42 (91,3%)	2 (4,3%)
Tension in the TMJs, a need to move the jaw so as to relax it	9 (19,6%)	36 (78,3%)	1 (2,2%)
Clicking noises in the TMJs	9 (19,6%)	36 (78,3%)	1 (2,2%)



Questionnaire, Signs, and Symptoms 1 (Winocur E., Uziel N., Lisha T., Goldsmith C., Eli I.: Self-reported Bruxism associations with perceived stress, motivation for control, dental anxiety and gagging. Journal of Oral Rehabilitation 2010.)	Yes	No	I don't know
Diurnal Bruxism			
1. Have you been aware of clenching or grinding your teeth while awake over the last six months?	☐	☐	☐
Nocturnal Bruxism			
The questionnaire refers to events over the last six months, as follows:			
1. Have you ever been aware of, or has anyone heard you, grinding your teeth frequently during sleep?	☐	☐	☐
2. Do your teeth show signs of greater wear than normal?	☐	☐	☐
3. Do you feel any of the following symptoms when you wake up in the morning:			
(i) Tiredness, tightness, or pain in the jaw?	☐	☐	☐
(ii) Are your teeth clenched or is your mouth hurt when waking up?	☐	☐	☐
(iii) Pain in temple?	☐	☐	☐
(iv) Difficulty opening your mouth?	☐	☐	☐
(v) A sensation of tension in the temporomandibular joint when waking up and a feeling of having to move your jaw to get it relaxed?	☐	☐	☐
(vi) Have you ever heard or felt a "click" in the temporomandibular joint when waking up that disappears later?	☐	☐	☐
The respondents were classified as bruxers if they answered YES to question 1 and/or question 2 in addition to, at least, one positive answer to one of the symptoms listed in question 3.			

The original questionnaire, used by Winocur et al. in 2010 (14), can be seen on Fig. 1.

Fig. 1 – Bruxism questionnaire, used by Winocur et al. in their study in 2010.

On Fig. 2, the translated version in Bulgarian of the questionnaire can be observed. (Fig. 2)

Fig. 2 – Translated version in Bulgarian of the original questionnaire, distributed via a Google form


Персонална анкета за отчитане на бруксизъм

4. DISCUSSIONS

It is visible from the results of the study, that the amount of students, affected by the symptoms of bruxism are not a large number. This is consistent with the results from other studies. (15) More people tend to clench their teeth (11 females, 6 males), although 6 people (4 female) have marked both of the responses – for clenching and grinding teeth. (1, 15) The percentage of respondents with symptoms from the TMJs is relatively low and stable, which is a sign that joints have not been affected for the time being.

5. CONCLUSIONS

Stress is one of the main factors for developing bruxing activities and has shown a strong correlation with it. Careful and timely measures should be undertaken to alleviate the symptoms of the bruxism and to cope with the possible appearance of symptoms from the TMJs and of a disorder. Improper clinical approaches can cause and additionally aggravate temporomandibular disorders – present at the moment and any future.

ACKNOWLEDGEMENTS

Authors of the study would like to thank the academic management of the Faculty of Dental medicine, Medical University – Varna, Bulgarian and the Department of Dental material science and prosthetic dental medicine for the aid during this pilot study and the opportunities provided.

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