Volume-1 | Issue-1 | September-2018 | ISSN - 2617-4421 (Print) | ISSN - 2617-7188 (Online) |

East African Scholars Journal of Medical Sciences
(An Open Access, International, Indexed, Peer-Reviewed Journal)
A Publication of East African Scholars Publisher, Kenya
www.easpublisher.com

Original Review Article

A Review on Bruxism-The Most Underrated Habit

Dr. Shyamala Naidu BDS MDS FICD FWFO[1], Dr. Anand Suresh BDS MDS FICD[2]
[1]Lecturer Penang International Dental College Level 18-21, NB Tower, 5050 Jalan Bagan Luar, 12000 Butterworth, Pulau Pinang, Malaysia
[2]Assistant Professor Penang International Dental College Level 18-21, NB Tower, 5050 Jalan Bagan Luar, 12000 Butterworth, Pulau Pinang, Malaysia

*Corresponding Author
Dr. Shyamala Naidu
Email: nandushamu@gmail.com
Article History
Received: 25.08.2018 | Accepted: 17.09.2018 | Published: 30.09.2018

Abstract: Bruxism is considered as the most dangerous of all oral parafunction habits which is associated with severe clenching and grinding of teeth. In general bruxism can be classified into two types "day time bruxism" which occurs during day and "nocturnal bruxism" which occurs during night. Although bruxism is considered to be just a habit, increase in frequency of episodes and severity in muscle contractions can lead to severe jaw disorders, headaches, tooth wear resulting in mobility. Till now bruxism has been the most underrated habit among patients until complications occur due to the lack of information regarding the signs and symptoms and the importance of when to seek medical advice. The following review article provides a brief overview about the various signs and symptoms, causes and various treatment modalities of patients with bruxism.
Keywords: Bruxism, Night guards, occlusal splints, Biofeedback

INTRODUCTION

According to American Academy of Orofacial Pain "Bruxism can be defined as total parafunctional daily or nightly activity that includes grinding, gnashing, or clenching of the teeth. It takes place in the absence of subjective consciousness and it can be diagnosed by the presence of tooth wear facets which have not resulted from the chewing function". The term "bruxism" comes from the Greek expression "brychein odontas" that means grinding the teeth. During the 20th century teeth grinding was referred to as "trigeminal neuralgia" by Karoyl. The first article regarding bruxism was published by Frohman who coined the term " bruxomania" which is a pure psychological state. Bruxism can be broadly classified into two types bruxism during daytime is a semi voluntary 'clenching' activity and is also known as 'Awake Bruxism' (AB) or Diurnal Bruxism (DB). Bruxism during daytime sleep or during night is termed as 'Sleep Bruxism' (SB).The prevalence of AB ids considered to be most common in females with no gender influence regarding SB. The occurrence of AB is considered to be higher (20%) compared to SB(16%).However Sleep bruxism is considered to occur most commonly in children more specifically about one year of age soon after the eruption of deciduous incisors.

Classification

Bruxism may be classified according to several criteria

Based on Occurence

- Awake bruxism: This is presented when the individual is awake.
- Sleep bruxism (SB): This is presented when the individual is asleep.
- Combined bruxism: This is presented in both situations.

Based on etiology

- Primary, essential or idiopathic bruxism: For which no apparent cause is known.
- Secondary bruxism: Secondary to diseases (coma,ictus, cerebral palsy), medicinal products (e.g., antipsychotic medication, cardioactive medication), drugs (e.g., amphetamines, cocaine, ecstasy).

3. Based on type of motor activity

- Tonic: Muscular contraction sustained for more than two seconds.
- Phasic: Brief, repeated contractions of the masticatory musculature with three or more consecutive bursts of electromyographic activity that last between 0.25 and two seconds apiece.

- Combined: Alternating appearance of tonic and phasic episodes.

Etiology

Bruxism is known to have multifactorial etiology. The most common etiology is associated with central factors such as stress sensitivity, emotions, personality features, sleep regulation, autonomic nervous system rather than on peripheral nervous system function or dental morphology and occlusion. Some authors have reported the use of certain medications such as dopamine agonists, dopamine antagonists, tricyclic antidepressants, selective serotonin reuptake inhibitors, alcohol, cocaine, and amphetamines (including those taken for medical reasons) as a potential cause of bruxism. Initially another common cause of bruxism were thought to be occlusal interferences due to improper occlusion. However reports show that individuals with dentures still suffer from bruxism. According to Macedo *et al.* genetic factors play an important role in patient suffering from bruxism, although no studies have reported any specific genetic markers.

Signs and Symptoms

The most common signs and symptoms of bruxism include:

- Facial pain
- Headaches
- Ear pain
- Pain and stiffness in the jaw joint (temporomandibular joint) and surrounding muscles, which can lead to temporomandibular disorder (TMD)
- Disrupted sleep (for you or your partner)
- Tooth wear or fractures which can lead to increased sensitivity and even tooth loss
- Broken teeth or fillings
- Limited jaw opening
- Tooth mobility
- Gum recession

Diagnosis

Although bruxism cannot be considered as a life threatening disorder a detailed case history can lead to early diagnosis and reduce the detrimental effects it can have on teeth and surrounding structures.

One of the common clinical sign of bruxism is the teeth wear and fracture which can be assessed by Individual (personal) Tooth-Wear Index to determine the severity of tooth wear. The extent of incisal or occlusal wear for a single tooth was evaluated by the following four-point scale:

0: no wear or negligible wear of enamel;

- obvious wear of enamel or wear through the enamel to the dentine in single spots;
- wear of the dentine up to one-third of the crown height;
- wear of the dentine up to more than one-third of the crown height; excessive wear of tooth restorative material or dental material in the crown and bridgework, more than one-third of the crown height.

Then, the individual (personal) tooth-wear index (IA) was calculated from the scores of incisal or occlusal wear for each tooth of that individual.

$$I_A = 10 \times G_1 + 30 \times G_2 + 100 \times G_3 / G_0 + G_1 + G_2 + G_3$$

where G_0, G_1, G_2 and G_3 are the number of teeth with scores of 0, 1, 2 and 3 respectively.

This method makes it possible to calculate the degree of individual (personal) tooth wear without being influenced by the number of missing teeth.

Intraoral Appliances

The Bruxcore Bruxism-Monitoring Device (BBMD) is an intra-oral appliance that was introduced as a device for measuring sleep bruxism activity. This plate evaluates bruxism activity by counting the number of abraded microdots on its surface and by scoring the volumetric magnitude of abrasion. The BBMD is a 0.51-mm-thick polyvinyl chloride plate that consists of four layers with two alternating colors and a halftone dot screen on the topmost surface. The number of missing microdots is counted to assess the abraded area and the number of layers uncovered represents the depth parameter. Both parameters are combined to obtain an index for the amount of bruxism activity. The major disadvantage with this method is that it is difficult to count the number of missing dots with good precision.

Another intraoral appliance known as *BITE FORCE* was introduced by Takeuchi *et al.* in 2001 which is a recording device for sleep bruxism, an intra-splint force detector (ISFD), which uses an intra-oral appliance to measure the force being produced by tooth contact onto the appliance. The force is detected using a thin, deformation-sensitive piezoelectric film, which is embedded 1–2 mm below the occlusal surface of the appliance. It was confirmed that the duration of bruxism events during simulated bruxism, i.e. clenching, grinding, tapping and rhythmic clenching, evaluated with the ISFD was correlated with that of the masseter EMG.

Portable EMG Recording Devices

EMG recording devices have been used since 1970's to record the number, duration and magnitude of bruxism events occurring in patients even while sitting at home. The portable EMG recording system has become easy for subjects to operate and can measure

masticatory muscle activity more minutely with fair accuracy.

Polysomnography

Polysomnographic (sleep laboratory) recordings for sleep bruxism generally include electroencephalogram, EMG, electrocardiogram and thermally sensitive resistor (monitoring air flow) signals along with simultaneous audio–video recordings. Sleep bruxism activity is assessed based on EMG activity in the masticatory muscles (masseter and/or temporalis). Because the sleep laboratory setting offers a highly controlled recording environment, other sleep disorders (e.g. sleep apnoea and insomnia) can be ruled out and sleep bruxism can be discriminated from other orofacial activities (e.g. myclonus, swallowing and coughing) that occur during sleep

Treatment

Treatments for bruxism depend on the cause and extent of the condition involved.

- Stress - One of the most important therapeutic tools is to give the patient information and a detailed, simple explanation of the clinical picture. If your bruxism is stress-related, professional counselling, psychotherapy, biofeedback exercises or other strategies will help to relax.
- Medications- Different medications have been prescribed by a physician or dentist to treat bruxism including benzodiazepines, anticonvulsants, beta-blockers, dopamine agents and muscle relaxants. A multiyear systematic review to investigate the evidence for drug treatments in sleep bruxism published in 2014 by Macedo *et al*. found insufficient evidence on the effectiveness of pharmacotherapy for the treatment of sleep bruxism.
- Specific drugs that have been studied in sleep bruxism are clonazepam, levodopa, amitriptyline, bromocriptine, pergolide, clonidine, propranolol, and l-tryptophan, with some showing no effect and others appear to have promising initial results; however, it has been suggested that further safety testing is required before any evidence-based clinical recommendations can be made.
- Massage- Grinding and clenching affects the masseter muscle the most often, since it is the largest and strongest muscle of the orofacial structure. When patients grind their teeth, it is usually the masseter muscle that is sore and inflamed. Massaging brings the circulation of the blood and nourishments to the muscles for healing while releasing the inflammation of the jaw, face, TMJ, neck, shoulders and upper back areas. Other massage benefits are: decreasing muscle pain and tension, relieving anxiety, stress and tension, relaxing muscles, alleviating headaches, facilitating removal of waste and inflammation by-products, stimulating the immune system and promoting relaxation and comfort.
- Biofeedback- Biofeedback is a device used to treat daytime clenchers by using electronic instruments to measure muscle activity and teach patients how to reduce muscle activity when the biting force becomes too severe. Although the evidence of biofeedback has not been tested for awake bruxism, there is recent evidence for the efficacy of biofeedback in the management of nocturnal bruxism in small control groups.
- Botulinum toxin (Botox)- Botulinum toxin (Botox) can lessen bruxism's effects. In an extremely diluted form, botulinum toxin is injected to weaken (partially paralyze) muscles and has been used extensively in cosmetic procedures to 'relax' the muscles of the face.Bruxism is regarded as a disorder of repetitive, unconscious contraction of the masseter muscle. In the treatment of bruxism, Botox weakens the muscle enough to reduce the effects of grinding and clenching, but not so much as to prevent proper use of the muscle. Although the intent of Botox injections is for the Botox to go into the muscle and not into the rest of the body, it has been shown some percentage of injected Botox winds up in the vascular system and migrates to other parts of the body. Botox treatment typically involves five or six injections into the masseter muscles.It takes a few minutes per side, and the patient usually starts feeling the effects the next day. Headaches and TMJ injuries could also be relieved with these injections.
- Night Guards or Occlusal splints-Night guards are one of the most popular treatment options for sleep bruxism. The goal of a night guard appliance is to redistribute occlusal forces, relax the masticatory muscles, stabilize the TMJ, protect the dentition and dental work, decrease the symptoms and, hopefully, reduce bruxism.Night guards can last an average of a few months to years depending on the force and frequency of grinding. There are a variety of night guards; choosing and advising the patient on the correct night guard is important.Night guards should be worn to protect restorations and recommended to patients who grind and have multiple crowns, bridges or implants due to quicker failure of restoratives. Periodontal patients who show any symptoms of bruxism, or if the patient acknowledges they grind their teeth, should be educated on the need of a night guard for protection. The patient must maintain the periodontium since they have less bone and tissue attachment, and additional loss is more detrimental to periodontal treatment plans. Night guards also maintain space between the teeth so the muscles of the jaw cannot fully contract and remain relaxed.

CONCLUSION

Diagnosing the cause of bruxism is important for determining treatment options. Over 80% of bruxers are unaware, in denial or ashamed they have a grinding habit.40 Utilizing printed patient education materials as well as educational sources, intraoral cameras, radiographic images, websites and pamphlets will help give patients a view of the underlying problem. Also, educating patients by personalizing and making them aware of the damage already done and what the future consequences could be for them if they do are not willing for treatment. Discussing costs of restorative treatment such as restorations, crowns and even possible future implants versus the cost of a night guard or behavioural changes will usually motivate a patient into positive action. It is always more beneficial if the problem can be resolved rather than only treating the symptoms.

REFERENCES

1. Cawson, R. A., Odell, E. W., & Porter, S. Cawson's essentials of oral pathology and oral medicine 2002. *Chapter*, *17*, 251.
2. De Laat, A., & Macaluso, G. M. (2002). Sleep bruxism as a motor disorder. *Movement Disorders*, *17*(S2), S67-S69.
3. De Leeuw, R. Orofacial pain. (2008). Guidelines for assessment, diagnosis and management.4th edition. Chicago: Quintessence.
4. Ekfeldt, A., Hugoson, A., Bergendal, T., & Helkimo, M. (1990). An individual tooth wear index and an analysis of factors correlated to incisal and occlusal wear in an adult Swedish population. *Acta Odontologica Scandinavica*, *48*(5), 343-349.
5. Forgione, A. G. (1974, January). Simple but effective method of quantifying bruxing behavior. In *journal of dental research* (vol. 53, no. Feb, pp. 127-127). 1619 duke st, alexandria, va 22314: amer assoc dental research.
6. Gu, W., Yang, J., Zhang, F., Yin, X., Wei, X., & Wang, C. (2015). Efficacy of biofeedback therapy via a mini wireless device on sleep bruxism contrasted with occlusal splint: a pilot study. *Journal of biomedical research*, *29*(2), 160.
7. Ikeda, T., Nishigawa, K., Kondo, K., Takeuchi, H., & Clark, G. T. (1996). Criteria for the detection of sleep-associated bruxism in humans. *Journal of orofacial pain*, *10*(3).
8. Macedo, C. R., Macedo, E. C., Torloni, M. R., Silva, A. B., & Prado, G. F. (2014). Pharmacotherapy for sleep bruxism. *Cochrane Database of Systematic Reviews*, (10).
9. Macedo, C. R., Silva, A. B., Machado, M. A. C., Saconato, H., & Prado, G. F. (2007). Occlusal splints for treating sleep bruxism (tooth grinding). *Cochrane Database of Systematic Reviews*, (4).
10. Manfredini, D., Winocur, E., Guarda-Nardini, L., Paesani, D., & Lobbezoo, F. (2013). Epidemiology of bruxism in adults: a systematic review of the literature. *J Orofac Pain*, *27*(2), 99-110.
11. Persaud, R., Garas, G., Silva, S., Stamatoglou, C., Chatrath, P., & Patel, K. (2013). An evidence-based review of botulinum toxin (Botox) applications in non-cosmetic head and neck conditions. *JRSM short reports*, *4*(2), 1-9.
12. Shakerian, R., Thomson, B. N., Gorelik, A., Hayes, I. P., & Skandarajah, A. R. (2015). Outcomes in emergency general surgery following the introduction of a consultant-led unit. *British Journal of Surgery*, *102*(13), 1726-1732.
13. Takeuchi, H., Ikeda, T., & Clark, G. T. (2001). A piezoelectric film-based intrasplint detection method for bruxism. *The Journal of prosthetic dentistry*, *86*(2), 195-202.
14. Tyldesley, W. R., Field, A., & Longman, L. (2003). Tyldesley's Oral medicine.