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Etiology, Diagnosis, and Management of Bruxism - A Review

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Abstract

Bruxism is considered to be a common clinical condition that is characterized by grinding and involuntary clenching of the teeth and is a risk factor for the development of masticatory dysfunction. It may also be accompanied by sleep disorders, odd body movements, respiratory issues, increased muscle activity, and irregular heartbeat. This disorder is becoming an important dental concern in children. The successful completion of treatment operations depends heavily on the early diagnosis and diligent monitoring of these patients. Management of these patients should be a holistic approach with evidence-based, cognitively oriented therapy. This review aims to comprehensively assess various aspects of Bruxism in dental practice.

Keywords: Bruxism, Clinical Practice, Holistic Approach, Masticatory Dysfunction

Introduction

The term 'Bruxism' may be defined as the involuntary, unconscious, and excessive grinding of teeth. During bruxism, there is forceful contact between the biting surfaces of maxillary and mandibular teeth. Bruxism can happen both during the day (known as wakeful or diurnal bruxism) and at night (known as nocturnal bruxism). While sleep bruxism does not exhibit any gender differences, awake bruxism is more common in

girls than in males. The main cause of bruxism has not yet been determined, but it is believed to be multifactorial.[1,2,3]

Regarding the prevalence of the condition, a study by Rodrigues, et al.,[4] the prevalence of bruxism in children ranges from 3.5% to 46%, whereas another study by Manfredini, et al.,[5] shows that the prevalence of bruxism in adults ranges between 8% and 31.4%; without reporting differences between gender or age in the SB, and a slight predominance of the AB in women.[6]

It is recommended that both children and adults receive interdisciplinary bruxism treatment. Some intraoral devices are used during dental treatment to safeguard teeth and restorations from potential damage that could be caused by parafunctional activity.[7] The use of cognitive-behavioural therapies, such as psychoanalysis, autosuggestion, hypnosis, progressive relaxation, meditation, self-control, and sleep hygiene, is another possibility.[8]

There is conflicting information regarding the etiology and management of these in current literature. Therefore this review paper aims to briefly explain the various aspects of bruxism and its management in clinical dental practice.

Etiology and Pathophysiology

Factors behind bruxism are considered to be multifactorial. It has been associated with peripheral factors like tooth interference, psychosocial conditions such as stress or anxiety and central or pathophysiological causes involving neuro transmitters or basal ganglia.[9]

Based on the source of Bruxism, various factors involved in development include:

a. Pathophysiological Factors

b. Psychosocial Factors

c. Peripheral Factors

Pathophysiological Factors

It is hypothesised that pathophysiological variables contribute to the development of bruxism. The physiology of sleep, particularly the "arousal response," has been intensively investigated in search of potential reasons for the problem since bruxism frequently happens when one is asleep. Arousal response is an abrupt shift in the sleep stage during which the person either awakens or shifts to a lighter sleep state.[10] According to research by Macaluso et al.,[11] 86% of bruxism episodes were linked to an arousal reaction and uncontrollable leg movements. This demonstrates that bruxism does relate to the arousal response.

Psychosocial Factors

Various studies have reported situations like stressful lifestyles could influence the development of bruxism but are still not conclusive.[12,13] Emotional stress is considered to be the main triggering factor.[14] According to a study by Van Selms et al.,[15]

experienced stress can considerably explain why people clench their teeth during the day, yet both experienced stress and predicted stress had little bearing on sleep bruxism as measured by ambulatory devices.

Peripheral Factors

In a study involving children, several occlusal variables were postulated to be connected to self-reported bruxism. Occlusal interference, which is frequently used to indicate a localised issue with the position or shape of a single tooth or group of teeth, may refer to a condition that interferes with the typical route of the bite. In their review of the literature, Manfredini et al.,[12]

noted the dearth of methodologically sound research that could conclusively reject the significance of occlusal variables in the aetiology of bruxism.

Diagnosis of Bruxism

Bruxism is often diagnosed clinically, mostly based on the patient's medical history.[16] The following diagnostic standards for sleep bruxism were given in the International Classification of Sleep Disorders revised version (ICSD-R): tooth clenching or grinding while sleeping, and B. one or more of the following: 1. Unusually worn teeth 2. Noises of grinding 3. Pain in the jaw muscles C. Polysomnography demonstrates both: 4. Jaw movement during sleeping 5. No epileptic activity in the vicinity D. No further physical or mental illnesses. E. The existence of other sleep problems.[14]

Management Strategies of Bruxism

Occlusal Adjustments

In some earlier research, early contacts or occlusal interferences were linked to the emergence of bruxism.[18] There are two types of occlusal management techniques for bruxism: 'true' occlusal interventions and occlusal appliances.

'True' occlusal interventions: Achieving harmonious interactions between the occluding surfaces is the goal of true occlusal interventions, which include techniques like occlusal equilibration, occlusal rehabilitation, and orthodontic therapy. Butler et al.,[19] provided some therapy options for bruxism but did not provide a solid theoretical foundation for any of them. In a study by Frumker et al.,[20] who developed a set of guidelines for an effective occlusal therapy based on the incorrect assumption that bruxers would find it easier to release tension in the masticatory and related musculature with better occlusal anatomy and function.

Occlusal appliances

The widely employed occlusal appliances are included in the second category of occlusal management techniques for bruxism. Most prescriptions detail the clinical and technical steps involved in producing different kinds of splints. These splints go by a variety of names, including "occlusal bite guard (modified)," "bruxism appliance," "bite plate," "night guard (retainer)," and "occlusal device," but at their core, they are all hard acrylic-resin stabilising appliances that are typically worn in the upper jaw.[21]

Behavioural approaches

The most popular technique is biofeedback, which is based on the idea that people who grind their teeth can "unlearn" their behaviour when something alerts them to their undesirable jaw muscle activity (a process known as "aversive conditioning"). Both bruxism that occurs when awake and bruxism that occurs while sleeping has been treated using this method. Patients can be taught to regulate their jaw muscle movements while awake by receiving auditory or visual input from a surface EMG. Feedback mechanisms for sleep bruxism can include auditory, electrical, vibratory, and even gustatory cues.[21]

Pharmacological approaches

The effectiveness of serotonergic and dopaminergic medications in the management of sleep bruxism has been examined in several studies. Selective serotonin reuptake inhibitors, or SSRIs, are antidepressants that might have unexpected effects on bruxism, either by making it worse or by having no noticeable impact (amitriptyline).[21] Neurotoxin Clostridium botulinum produces, botulin toxin, which is being utilised to treat several medical disorders, including bruxism, and for aesthetic purposes. It inhibits the synthesis of acetylcholine and blocks calcium channels in nerve endings, preventing muscular contraction momentarily.[22]

Conclusion

Bruxism is a multifaceted disorder, an interprofessional team should collaborate to better address the condition and to improve patients' quality of life, including dentists, mental health nurses, pediatricians, primary

caregivers, neurologists, and psychotherapists. This article briefly discussed the etiology, diagnosis and various modes of management of bruxism with appropriate interventions to treat these patients in day-to-day practice.

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