

## BRUXISM IN DENTISTRY - AN OVERVIEW

\*VEE NA HE GDE, MDS

### ABSTRACT

*Although not a life-threatening condition, chronic bruxism often impairs the quality of life of affected individuals. In advanced stages, the condition might be accompanied by tooth sensitivity, abrasion, fractures, mobility, or loss, dental caries, alveolar bone loss, headaches, earaches and adverse cumulative, irreversible effect on dental implants and aesthetic restorations. Diminished facial height along with hypertrophy of the masseter may change one's appearance. Early detection of the problem not only helps to suppress the habit, but also prevents adverse dental consequences.*

**Key words:** *Bruxism, night grinding, occlusal splints*

### INTRODUCTION

The word bruxism is taken from the Greek word *brychein* meaning gnashing of teeth. The term "la bruxomanie" was first introduced in 1907 by Marie Pietkiewicz. It was later adapted to bruxism to describe the gnashing and grinding of teeth without a functional purpose.<sup>1</sup> Though *bruxomania* (the neurotic habit of grinding the teeth in the daytime) was first observed in 1907, grinding movements during sleep were not documented until Frohman introduced the term-bruxism in 1931.<sup>2</sup> Although the term *bruxism* is not generally known to lay people, it is shorter and more convenient than *teeth clenching or grinding*.

Bruxism can be best defined as the involuntary, unconscious and excessive grinding, tapping or clenching of teeth. When it occurs during day it is called *wakeful bruxism* and during *sleep bruxism*.

According to the International Classification of Sleep Disorders (ICSD) sleep bruxism is defined as a stereotyped movement disorder characterized by the grinding or clenching of teeth during sleep.<sup>3</sup>

It has been estimated that 5-20% of all people excessively grind or clench their teeth, thereby exerting powerful forces on teeth, gums, and joints. Regardless of actual prevalence, bruxism is a widespread behavioral pattern which adversely affects the quality of life of affected individuals.

### CAUSES AND PATHOPHYSIOLOGY

The suggested causes of bruxism include anxiety, and sensitivity to brain chemicals (neurotransmitters such as dopamine and serotonin). Anxiety, stress, anger and frustration may act like as trigger or an exacerbating factor. Antidepressants such as serotonin selective reuptake inhibitors (SSRI) are known to precipitate grinding.<sup>4</sup> Some times it can be a complication of another disorder, such as Huntington's disease or Parkinsonism. Using caffeine, tobacco, cocaine or amphetamines seem to increase the risk of bruxism.

In children, bruxism may be related to growth and development. There is some evidence that tension, anger and even teething can precipitate grinding in children. Bruxism occurs in up to 30% of children, often around the age of 5 and 6. But most children overcome bruxism before they get their permanent teeth.

### DENTAL IMPLICATIONS OF BRUXISM

Sleep bruxism exerts a powerful force on the teeth, gums and joints that is anywhere from 3-10 times the force of normal chewing.<sup>5</sup> This is because the bruxing is an unconscious activity and the entire force is applied directly to the teeth. While not a life-threatening condition, chronic bruxism often impairs the quality of life of affected individuals. Some suspected symptoms and consequences of this habit are listed below:<sup>6</sup>

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\*Associate Professor of Prosthetics, Manipal College of Dental Sciences, Manipal — India

- Worn-out, sensitive, fractured, decayed or loose teeth.
- Occlusal problems
- Change of facial appearance
- Jaw pain; fatigue of facial muscles
- Damage the temporomandibular joints

Chronic bruxism results in enamel wear out and dentin exposure. There is loss of cusps and natural tooth contour. The absence of enamel makes it easier for bacteria to penetrate the softer part of the teeth and produce cavities. With time, the condition may lead to bridges, crowns, root canals, implants, partial dentures, and even complete dentures. Hence most bruxers by 40 to 50 years of age have worn their teeth to the degree that extensive tooth restorations must be performed.'

Malocclusion is more common among bruxers than in the general population. Bruxism may often involve more pressure on one side of the mouth than on the other, thereby causing occlusal problems. As the teeth wear out and distance between upper and lower jaws decreases, over closure may develop and sometimes the lower teeth may override the front upper teeth.

Long-term bruxism often causes changes of appearance, in at least three different ways. First damaged, worn-out teeth are not as appealing as healthy teeth. Second, as the teeth wear out, they become shorter. As a result, when the mouth is closed, the upper and lower jaws become closer, the chin recedes, and the person looks comparatively old.<sup>8</sup> Third, bruxism involves excessive muscle use, subsequent hypertrophy of jaw muscles and a characteristic, square-jaw appearance results. Some times hypertrophied masseter block parotid duct and this in turn may lead to periodical parotid swelling, pain, inflammation, and abnormal dryness of the mouth.<sup>9</sup>

There is some evidence of higher levels of mercury in the blood of some bruxers with mercury fillings.<sup>10</sup> However, American Dental Association states that there is insufficient evidence to justify claims that mercury from dental amalgams has an adverse effect on the health of patients.<sup>11</sup>

Bruxism is generally considered a contraindication for dental implants, although the evidence is usually based on clinical experience only. So far, studies to the possible cause-and-effect relationship between bruxism and implant failure do not yield consistent and specific outcomes. This is partly due to the large variation in the technical and the biological aspects of the investigations. Although there is still no proof that bruxism causes overload of dental implants and their suprastructures, a careful approach is recommended.

## **DIAGNOSIS**

Diagnosis of Bruxism is fairly simple and most often is made by a family member or a sleep partner who complains of hearing grinding. The characteristic features on oral examination show abnormal wear/damage of the teeth and increased jaw muscle size. The wear associated with grinding is most evident on the molars. Final diagnosis may be done in a sleep lab through an audio-video recording. The wear and tear of bruxism should be differentiated from the loss of dental substance due to energetic brushing of teeth (abrasion), functional wearing out (attrition) and erosion due to chemical substances e.g., vinegar, lemon, gastric acid regurgitation.

## **MANAGEMENT**

The treatment should be started as soon as the condition is diagnosed. This allows early noninvasive therapy instead of waiting until further tooth structure is destroyed which requires further extensive care.

Psychotherapy or counseling may help the afflicted person to express anger and deal with anxiety or stress. Relaxation or stress management techniques can be beneficial in reducing anxiety or stress. A highly significant reduction in bruxism has been obtained using a biofeedback system. The concept that the etiology of bruxism is related to emotional stress is supported as biofeedback has been successful in controlling other stress-related parameters. The form of biofeedback used as an audible tone derived from amplified electromyographic data, relayed to the subject via an earpiece. With this, the patient learns to associate teeth grinding with stress and tries to modify his behaviour.

Muscle relaxants such as methocarbamol, cyclobenzaprine could be administered at bed time to decrease muscle pain and spasm. Anxiolytic such as diazepam and clonazepam may be helpful by relieving stress and anxiety.

Occlusal splints are commonly used for the treatment of nocturnal bruxism. In United States alone, 3.6 million splints (also known as night guards, bite guards, biteplates etc) are annually prescribed.<sup>12</sup> There are many variations; most common is the customized, hard acrylic variety. Their surface is flat and they cover the occlusal surface and the incisal edges of the incisors and canines. The splints provide protection for the teeth and reduced grinding sound. They have disadvantages too, some patients may find them uncomfortable to wear and sometimes splints may negatively influence one's bite and may lead to degenerative changes in temporomandibular joint. Many researchers feel that the splint does not diminish bruxing behavior, in the long term, nor alleviates most symptoms and consequences.

Recently the NTI Tension Suppression System (NTI-TSS)" is under clinical trial. By preventing the nocturnal parafunctional occluding of the canine and molar teeth (which is required to generate significant muscle contraction intensity and jaw joint strain), the NTI-tss device prevents and reduces the muscular triggering component.

There are some studies to suggest that intramasseter injection of botulinum toxin administered by skilled practitioners is a safe and effective treatment for people with severe bruxism, particularly those with associated movement disorders.<sup>14</sup> It should be considered only for those patients refractory to conventional therapy.

Bruxers have enhanced tooth sensitivity and use of strontium chloride or potassium nitrate containing tooth paste or gels may be helpful. Chemical desensitization, surface sealers or self etch primers are also equally effective, but costly.

Other measures include avoidance of alcohol, caffeine and tobacco as they seem to make bruxism worse. Resting in lateral position or on stomach may help some subjects as dorsal position while sleeping seems to aggravate the condition. Regular dental examina-

tions are the best way to screen against bruxism in those who do not have sleep partner.

## PROGNOSIS

Even without special treatment, more than half of young children with bruxism stop grinding their teeth by age 13. Till then nocturnal splint should be recommended to prevent excessive tooth wear. In teen-agers and adults, the prognosis is excellent if bruxism is treated properly. There is evidence that bruxism decreases with increasing age, from 5 to 10% in adulthood to less than 2% in old age. Better results are obtained when treatment is initiated early, before the habit is ingrained and has already brought about irreversible damage.

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