SLEEP BRUXISM

Managing sleep bruxism

BACKGROUND

Sleep bruxism (SB) is a repetitive jaw muscle activity that produces clenching or grinding of the teeth, sometimes accompanied by bracing or thrusting of the mandible. According to studies, it affects between 5% and 91% of patients, depending on the method used to collect data. Among the general population, estimates place the incidence at 8% to 13%. SB can produce hypertrophy of the muscles of mastication, loss of tooth surface, fractured restorations or teeth, and hypersensitive or painful teeth. In addition, the excessive forces on the teeth can contribute to alveolar bone resorption and increased mobility. If the patient already has periodontal disease, the occlusal trauma may accelerate the progression of disease. SB is considered primary when no preexisting causative medical condition is identified and secondary when a psychiatric or medical condition has been diagnosed as causative. The current state of knowledge related to SB, its diagnosis, and its management was outlined.

CHARACTERIZATION OF SB

SB is likely caused by a multitude of factors that interact in a complex fashion. It's generally accepted that the pathophysiology of this disorder relates to activation of the central nervous system during sleep, but several factors contribute and fall into the categories of exogenous factors (smoking, heavy drinking, caffeine intake, or the use of medications or illicit drugs); psychosocial factors (stress and anxiety); sleep disorders that cause arousals during sleep; and comorbid conditions such as obstructive sleep apnea and gastroesophageal reflux disorder.

SB tends to occur as a reaction to micro-arousals during sleep. It can accompany other sleep disorders, such as sleepwalking, sleep terrors, or sleep-talking. About 60% of subjects without SB also have masticatory muscle activity during sleep, but it tends not to involve tooth contact and occurs to a much less extent than is seen in SB patients. Some evidence indicates that SB may be protective during sleep, specifically related to airway maintenance or salivary stimulation.

DIAGNOSIS

The diagnosis of SB can be based on patient report and clinical interview, clinical examination, intraoral appliance use, recordings of muscle activity, electromyography (EMG), and/or polysomnography (PSG). Although PSG is considered the "gold standard" for the diagnosis of SB, it's a complex process that is expensive and requires monitoring in a sleep laboratory, making it unsuitable for widespread clinical use. It's generally reserved for research purposes. All the methods for diagnosing SB suffer from limitations. The best approach appears to be a combination of techniques, since so many of the clinical signs of SB are nonspecific for the disorder. A reasonable approach would be to consider any plausible patient reports in conjunction with observation of a combination of clinical signs (Table 1).

MANAGEMENT

SB alone does not require treatment, but its effects can require interventions when problems arise. Little high-quality evidence is currently available to recommend a specific SB management protocol, but a number of methods have been used. These include occlusal splints and appliances, behavioral interventions, and pharmacological methods.

Oral Appliances

For the oral appliances used, the goal is to protect the dentition from damage caused by clenching and/or grinding, with their effects on muscle activity unclear. They may also

Table 1. Questions to Elicit Patient Reported History of Bruxism, and Suggestive Clinical Indicators

Questions to use during history taking	Are you aware of grinding your teeth during sleep? Has anyone told you that you grind your teeth during sleep? On waking, do you have your jaws clenched a thrust forward? On waking, do you experience pain a stiffness in the jaw muscles?
'Brux Scale' questions. van der Meulen *et at*.[31]	How often do you clench your teeth during sleep? How often do you grind your teeth during sleep? How often do you clench your teeth whilst awake? How often do you grind your teeth whilst awake?
Factors on clinical examination suggestive of bruxism	Masseteric hypertrophy Muscle tenderness on palpation Wear facets on occlusal surfaces either within the normal envelope of movement of at eccentric jaw positions: termed 'bruxofacets' Shiny spots on restorations Restorat ion or tooth fracture Tongue scalloping and ridging on the cheek mucosa ('linea alba')

(Courtesy of Beddis H, Pemberton M, Davies S: Sleep bruxism: An overview for clinicians. *Br Dent J* 225:497-501, 2018.)

address temporomandibular disorders and obstructive sleep apnea.

Although soft vacuum-formed splints are readily constructed and fitted, they can be difficult to adjust. Some anecdotal evidence suggests they can exacerbate bruxism as well as treat it. They are often a short-term remedy, since they deteriorate quickly. Hard acrylic splints may be more effective.

Stabilization splints can address muscle activity and prevent bruxism from causing unwanted problems. These splints should offer full occlusal coverage and balanced occlusal contact across the arch. It's important to consider canine guidance on excursions. The occlusion should be provided in a retruded contact position.

Some evidence suggests that stabilization splints used for SB can aggravate obstructive sleep apnea. A small sample of patients suffered an increase in their hypopneic/apneic episodes while wearing these splints and had a significant increase in snoring. Further research is needed.

Partial coverage anterior splints can be helpful in reducing muscle activity, but should be used with caution. Patients wearing these splints should be carefully monitored to avoid tooth mobility or overeruption of uncovered teeth, which can cause problems with occlusion.

In addition to these, there are a wide range of over-the-counter splints readily available. Concerns with these arise because they are offered without any protection from unsubstantiated claims of efficacy and other adverse effects.

Behavioral Interventions

Various behavioral strategies have been used to address SB. Biofeedback has been undertaken to provide immediate information to patients about their behavior, which should lead to a reduction in its incidence. Among the techniques are electromyography with auditory, vibratory, or electric stimulatory feedback; occlusal splints that release an unpleasant taste when the patient clenches or grinds; and devices that awaken the patient during SB. No long-term evidence supports the efficacy of these techniques, and some fear that strategies that arouse the patient from sleep may produce excessive daytime sleepiness.

Sleep hygiene measures are designed to reduce any influence of psychological stress on SB. Among the measures used are avoiding caffeine close to bedtime, keeping the bedroom well-ventilated and quiet, relaxing close to bedtime, and using relaxation techniques before sleeping.

Pharmacological Measures

The drugs used to address SB include benzodiazepines, anticonvulsants, beta-blockers, serotonergic and dopaminergic agents, antidepressants, and muscle relaxants. The evidence to support the use of pharmacological interventions is insufficient. It's recommended that drugs should be given only when other conservative measures have failed and under the close supervision of a medical practitioner.

Botulinum toxin has been administered to the muscles of mastication to reduce the frequency of bruxism, which it will do. Concerns have focused on the possibility that such administration can lead to osteopenic changes in the condyles and muscle attachment sites. More research is needed to determine efficacy and long-term outcomes.

Clinical Significance

Bruxism can damage teeth and restorations, so dentists are often called upon to provide treatment. However, the current evidence does not identify the best intervention for the problems that arise with SB. It's now recognized as a central nervous system–mediated occurrence that may be related to other conditions that arouse patients from sleep. The diagnosis should be based on the patient's history and a clinical examination, along with any other information that seems pertinent. Dental management is aimed at protecting the oral structures. The most common means of treating SB are intraoral splints of various types, depending on the patient's symptoms. Irreversible occlusal adjustments and botulinum toxin injections are not appropriate interventions based on current evidence. Patients may respond to behavioral interventions and pharmacological measures of various types.

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