Current Concepts of Bruxism

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Bruxism is a common phenomenon, and emerging evidence suggests that biologic, psychologic, and exogenous factors have greater involvement than morphologic factors in its etiology. Diagnosis should adopt the grading system of possible, probable, and definite. In children, it could be a warning sign of certain psychologic disorders. The proposed mechanism for the bruxism-pain relationship at the individual level is that stress sensitivity and anxious personality traits may be responsible for bruxism activities that may lead to temporomandibular pain, which in turn is modulated by psychosocial factors. A multiple-P (plates, pep talk, psychology, pills) approach involving reversible treatments is recommended, and adult prosthodontic management should be based on a common-sense cautionary approach. *Int J Prosthodont 2017;30:437–438. doi: 10.11607/ijp.5210*

A recent consensus definition of bruxism describes it as a repetitive jaw-muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. The activity can occur during sleep (sleep bruxism [SB]) and during wakefulness (awake bruxism [AB]).[1] This concise report overviews current state-of-the-art concepts; focuses on etiology, diagnosis, and management; and seeks to underscore its dental professional relevance.

Diagnosis, Epidemiology, and Etiology

Bruxism is a common phenomenon, with prevalence ranges of 8% to 31% for generic bruxism (ie, without a distinction between AB and SB), 22% to 31% for AB, and 13% ± 3% for SB in adults.[2] There are notably no differences between men and women, and prevalence decreases with increasing age. High prevalences are also found in children and adolescents (eg, 3.5% to 40% for SB).

Biologic (eg, neurochemicals such as dopamine and other neurotransmitters, genetics, sleep arousals), psychologic (eg, stress sensitivity, personality traits, anxiety), and exogenous factors (eg, smoking, alcohol, caffeine, certain medications such as selective serotonin reuptake inhibitors, illicit drugs) are involved in the etiology of bruxism, abandoning past paradigms of dental occlusion.

Several approaches are available to make a bruxism diagnosis: self-report (questionnaires, oral history), clinical examination, instrumental techniques (such as electromyography [EMG] and polysomnography [PSG]), and real-time evaluation strategies based on the ecologic momentary assessment approach (EMA).[1] Differential diagnosis should be made with oral movement disorders, such as orofacial dyskinesia and oromandibular dystonia, which, when confined to the jaw, resemble tooth grinding and clenching, respectively.

Bruxism in Children

Current intepretations of bruxism in adults suggest that it may be judged as a behavior that can become a risk factor for some possible clinical consequences. During childhood, this evaluation is difficult; SB may be part of an ongoing physiologic maturation of the central nervous system. However, two other possible explanations can be considered.[3] First, a personality profile of the bruxer child has been developed featuring high levels of responsibility and of neuroticism in particular, as well as the presence of other psychologic and social factors, mainly concerning peer relationships and behaviors. Second, grinding the teeth during sleep could be an attempt to restore airways patency in children with respiratory disturbances.

Bruxism and Prosthodontics

Bruxism is more frequently associated with mechanical (eg, screw loosening, ceramic chipping or fracture, fixture or abutment fracture) rather than biologic (eg, compromised marginal bone attachment, biologic failure) complications.

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Prosthodontic treatment planning should consider the many risk factors (eg, teeth with root canal treatments, provisional restorations, crown-root ratio, and number and size of the implants) that may be exaggerated by bruxism. Dentists should adopt a good sense–based approach to prosthodontic restorations in bruxers. The habitual position should be used as reference whenever possible. When positional changes of the mandible (increase in vertical dimension of occlusion) are needed for prosthetic reasons (eg, tooth wear preventing refinement of retentive crown preparations, not enough interarch space to restore or replace some teeth, esthetics), the habitual position cannot be adopted as reference because the teeth cannot supply it anymore, and centric relation should be taken as the reference position for mounting casts in a reproducible way.

Bruxism and Pain

The literature on the relationship between bruxism and pain is controversial. Observations that SB and AB may have a different etiology and that clenching- and grinding-type activities are different motor phenomena with potentially different consequences in terms of muscle fatigue and joint stress may explain the contrasting reports. EMG adaptations to pain in the jaw muscles can limit the usefulness of PSG to detect clinical consequences of SB.[4] For example, certain types of bruxism activities (eg, prolonged, high-intensity, isometric contractions as in the case of mandible bracing) may be plausible triggers for temporomandibular pain, but they are likely to be detected as such only in the early stages of pain onset, before protective adaptations effectively reduce muscle activity.

The proposed mechanism for the relationship between bruxism and temporomandibular disorder within a biopsychosocial framework at the individual level is that stress sensitivity and anxious personality traits may be responsible for those bruxism activities that may lead to temporomandibular pain, which, in turn, is modulated by psychosocial factors (eg, depression, anxiety, and treatment-seeking behavior).

Bruxism Management

Sound information is lacking on strategies to effectively manage bruxism. More research is needed, especially considering the lack of knowledge of the indications for treatment. Such an approach contrasts with recent recommendations to consider SB as a behavior and not a disorder per se. In the absence of definite recommendations, dentists are suggested to follow the multiple-P approach: plates (ie, hard stabilization appliances; not soft splints or over-the-counter splints), pep talk (ie, counseling), psychology (ie, specialist support for managing psychologic disorders and personality features potentially associated with bruxism), and pills (ie, medication, prescribed by specialists, only when the other Ps fail).[5]

Conclusions

The relevance of bruxism in pediatric patients, its importance as a non-negligible factor for prosthodontic treatments, and the complex relationship with TMD pain make bruxism a challenging topic in diverse dental fields. However, all dentists should realize that *bruxism* is an umbrella term that groups together multifaceted phenomena that may have different etiologies and relationships with various purported consequences.

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References

1. Lobbezoo F, Ahlberg J, Glaros AG, et al. Bruxism defined and graded: An international consensus. J Oral Rehabil 2013;40:2–4.
2. Manfredini D, Winocur E, Guarda-Nardini L, Paesani D, Lobbezoo F. Epidemiology of bruxism in adults: A systematic review of the literature. J Orofac Pain 2013;27:99–110.
3. Serra-Negra JM, Ramos-Jorge ML, Flores-Mendoza CE, Paiva SM, Pordeus IA. Influence of psychosocial factors on the development of sleep bruxism among children. Int J Paediatr Dent 2009;19:309–317.
4. Murray GM, Peck CC. Orofacial pain and jaw muscle activity: A new model. J Orofac Pain 2007;21:263–278.
5. Manfredini D, Ahlberg J, Winocur E, Lobbezoo F. Management of sleep bruxism in adults: A qualitative systematic literature review. J Oral Rehabil 2015;42:862–874.