

Bruxism defined and graded: an international consensus

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SUMMARY To date, there is no consensus about the definition and diagnostic grading of bruxism. A written consensus discussion was held among an international group of bruxism experts as to formulate a definition of bruxism and to suggest a grading system for its operationalisation. The expert group defined bruxism as a repetitive jaw-muscle activity characterised by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. Bruxism has two distinct circadian manifestations: it can occur during sleep (indicated as sleep bruxism) or during wakefulness (indicated as awake bruxism).

For the operationalisation of this definition, the expert group proposes a diagnostic grading system of 'possible', 'probable' and 'definite' sleep or awake bruxism. The proposed definition and grading system are suggested for clinical and research purposes in all relevant dental and medical domains.
KEYWORDS: bruxism, sleep bruxism, awake bruxism, definition, diagnostic grading system

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Introduction

Bruxism is an oral condition of great interest to both researchers and clinicians in the dental, neurological and sleep medicine domains. Although associated with a number of clinical problems, including orofacial pain, tooth wear and failing dental restorative treatments (1, 2), bruxism remains difficult to manage in effective and safe ways (3). It is therefore frustrating that consensus is lacking regarding a definition and a diagnostic grading system for bruxism, bearing in mind that this is a prerequisite for evidence-based treatment. The authors of this study, representing an international group of bruxism experts, wish to resolve this issue by proposing a definition for bruxism that is

straightforward, respectful towards its circadian characteristics, unbiased with purported underlying etiological mechanisms, and stripped of possible associations and co-morbidities. In addition, because of the scarcity of reliable and valid diagnostic tools for bruxism, a diagnostic grading system is proposed for clinical and research purposes.

Method

The approach adopted by the authors was a written consensus discussion, via e-mail. The discussion was open in nature, and driven by the experience and opinions of the participating bruxism experts. It began with a draft version of the definition and diagnostic

grading system prepared by one of us (FL). Editing continued until all authors were in full agreement.

Definition

The most common bruxism definitions in current use are those formulated in the eighth edition of the Glossary of Prosthodontic Terms (GPT-8) (4), in the second edition of the International Classification of Sleep Disorders (ICSD-2) (5), and in the fourth edition of the Orofacial Pain Guidelines (OFPG-4) (6), published by the American Academy of Orofacial Pain. These three definitions are scrutinised critically later, after which a new definition of bruxism is proposed.

In the GPT-8, bruxism is defined as ‘the parafunctional grinding of teeth’, and as ‘an oral habit consisting of involuntary rhythmic or spasmodic nonfunctional gnashing, grinding or clenching of the teeth, in other than chewing movements of the mandible, which may lead to occlusal trauma’ (4). By employing terms like ‘rhythmic’ (is there really a recurrence of activities at regular intervals while bruxing?), ‘spasmodic’ (does bruxism indeed have the nature of a spasm?) and ‘gnashing’ (isn’t this simply another word for grinding?), this definition is more complicated than necessary. It has the further drawbacks of lacking a link to the sleep-wake state of the condition, of focusing on tooth contact conditions only (isn’t it possible that the edentulous mandible is braced or thrust, using the same jaw-muscle activation patterns as in the case of teeth clenching and grinding?), of indicating just one of the many purported consequences (viz., occlusal trauma), and of using the ‘coloured’ terms ‘parafunctional’ and ‘oral habit’. By definition, a parafunction is a disordered function, which implies that bruxism is a distorted, bad condition with negative effects. But are we actually certain that bruxism does not have any important positive physiological functions, such as facilitating unobstructed air-flow during sleep? A putative role of masticatory muscle activities during sleep in upper airway patency has already been suggested in the literature (7). Likewise, an oral habit implies that bruxism is a condition under full influence of the human mind and can thus be switched on or off at will. But how could one be able consciously to influence bruxism during sleep?

The ICSD-2 lists sleep bruxism among the sleep-related movement disorders (previously, among the parasomnias) (5). The condition is defined as ‘an oral activity characterised by grinding or clenching of the

teeth during sleep, usually associated with sleep arousals’. The major drawbacks of this definition are its confinement to sleep bruxism (in the accompanying text, it is only stated that bruxism can occur during waking, but that this is a different disorder with an unknown association with sleep bruxism), and the statement of its common association with sleep arousals [which is just one of several reported associations with sleep bruxism for which evidence is accumulating (1)]. The inclusion of sleep bruxism among the movement disorders is an improvement with respect to its former labelling as parasomnia, the latter being defined as an abnormal sleep behaviour (but, as questioned above, isn’t it possible that [sleep] bruxism serves a physiological goal?). Moreover, the term ‘movement disorder’ implies an abnormal function and should thus be avoided in otherwise healthy persons.

According to the OFPG-4, bruxism is a ‘diurnal or nocturnal parafunctional activity including clenching, bracing, gnashing and grinding of the teeth’ (6). Most of the drawbacks of this definition (viz., the use of terms like ‘parafunctional’ and ‘gnashing’) are outlined above. In addition, this definition employs ‘diurnal’ and ‘nocturnal’ as indicators for the condition’s circadian relationships, while ‘sleep’ and ‘awake’ are to be preferred for their unbiased nature (some of us sleep during the day and are awake at night). The inclusion of bracing is interesting, although linking this term to the teeth makes bracing a mere synonym of clenching.

Given the limitations raised above regarding current definitions for bruxism, the authors of this study propose the following definition:

Bruxism is a repetitive jaw-muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. Bruxism has two distinct circadian manifestations: it can occur during sleep (indicated as sleep bruxism) or during wakefulness (indicated as awake bruxism).

This definition is free of any of the drawbacks of the bruxism definitions discussed earlier. Pending validation, the definition can be used in clinical settings and research. In addition, the authors strongly recommend that future research clearly distinguishes which form(s) of bruxism was (were) being studied: sleep bruxism, awake bruxism, or both.

Diagnostic grading system

Several techniques are available, all with their advantages and limitations, to operationalise the new definition (1, 2). Commonly used are questionnaires (practical for large-scale studies, but their subjective nature risks over- or underscoring the condition), clinical examination (suitable for larger study populations, but for example tooth wear as a proxy for bruxism suffers from its cumulative nature and multiple differential diagnoses), electromyography (applicable in moderately sized populations, but of limited availability) and polysomnography (gold standard tool for sleep bruxism diagnosis (8), but a technique suited only to small samples due to high cost and limited availability). It should be stressed that despite an abundance of techniques, reliable and valid diagnostic tools for bruxism are scarce. Therefore, following the approach recently suggested for the grading of neuropathic pain (9), a diagnostic grading system of 'possible', 'probable' and 'definite' sleep or awake bruxism is suggested for clinical and research purposes.

The authors of this study suggest that 'possible' sleep or awake bruxism should be based on self-report, by means of questionnaires and/or the anamnestic part of a clinical examination. 'Probable' sleep or awake bruxism should be based on self-report *plus* the inspection part of a clinical examination. 'Definite' sleep bruxism should be based on self-report, a clinical examination, and a polysomnographic recording, preferably along with audio/video recordings. For polysomnography, cut-off points for a sleep bruxism diagnosis have been proposed (8). More recently, the diagnostic consequences of the time-variant nature of sleep bruxism were quantified, yielding the suggestion to use cut-off bands around the previously suggested cut-off points when diagnosing sleep bruxism (10). Finally, for a grading of 'definite' awake bruxism, self-report, clinical examination and an electromyographic recording are needed, preferably combined with the so-called ecological momentary assessment methodology, which enables a true estimate to be obtained of, amongst others, the frequency of tooth contacts during wakefulness (11).

Clearly, apart from polysomnography for the diagnosis of sleep bruxism, for which diagnostic criteria have been formulated, the other techniques that form part of this proposal (*viz.*, questionnaires, clinical examination and electromyography) need further elaboration. Until

widely available, cost-effective, reliable and valid diagnostic tools are developed, it is suggested that clinicians and researchers apply the proposed grading system using the best available evidence.

Conclusion

It is the authors' hope that the definition and diagnostic grading system for bruxism proposed here becomes widely adopted by researchers as well as clinicians in all relevant dental and medical domains. This will provide a solid foundation for the further development of this scientifically intriguing and clinically relevant topic.

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