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BRUSSISM IN CHILDREN - THERAPY CHALLENGES: A LITERATURE REVIEW

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ABSTRACT

Introduction: Bruxism is characterized by being a parafunction of the stomatognathic system, which can occur in two ways: through teeth clenching or laterality. This process can cause several injuries, such as dental and joint injuries. The etiological factors of bruxism are variable, and their discovery becomes fundamental to the development of an efficient treatment plan for each patient. Nowadays the number of children who have this malfunction has grown, causing professionals of Pediatric Dentistry to look carefully at this situation. **Objective:** Due to this growth factor, a constant search for knowledge about bruxism is necessary in order to its treatment to become more efficient. In this way, this paper aims to search articles in databases and to raise as much as possible, in order to discuss the subject with greater scientific relevance. **Methodology:** We searched articles from the last 10 years, in various databases, with specific descriptors, in order to perform a literature review as complete as possible. The articles found were selected according to the pre-established inclusion and exclusion criteria. **Conclusion:** The selected articles showed that the increasing number of children with bruxism makes this situation more prominent among dentists, specifically those of pediatrics. Thus, the most up-to-date knowledge makes the diagnosis become earlier, facilitating an effective treatment plan.

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INTRODUCTION

The stomatognathic system, consisting of jawbones along with muscles, soft tissues, dental arches, vascular and nervous supply, and the temporomandibular joint (TMJ); it can suffer from many factors as it performs various functional as well as parafunctional activities. Functional, also called physiological, include chewing, phonation, and swallowing habits, which are commonly protected by muscles. On the other hand, parafunctional habits are not protected and it triggers unnecessary muscle contraction, causing several damages. Among the well-known parafunctional habits is bruxism (PRIMO et al., 2009; CASTRO et al., 2012; CIELO et al., 2016). The term "bruxism" comes from the Greek word "bruchein", which means the clenching, friction and friction of

dental elements. It is defined in the literature as a parafunctional activity of the stomatognathic system, specifically the masticatory system. In this situation jaw disorders occur with or without a sound, which can happen during the day and / or at night (SILVA; CANTISANO, 2009; GONÇALVES et al., 2010; MORAIS et al., 2015). Bruxism has as etiology several factors thus having a multifactorial and complex etiology. Some conditions may favor and even intensify this atypical activity, such as dental, psychological and emotional, systemic, occupational, idiopathic, hereditary, occupational and even nutritional problems (SILVA; CANTISANO, 2009; GAMA et al., 2013; MACHADO et al., 2014; ALENCAR et al., 2014). This parafunctional habit can affect many different ages. However, in general, children may develop these habits more easily, impairing the balance

between function and the growth of one or more symptoms, in which case the stomatognathic and masticatory ones (RIOS *et al.*, 2018). The literature has highlighted that bruxism in children favors the alteration of the craniofacial complex growth, due to its complex etiology and its possible effects on the affected systems. This can cause damage to the TMJ, facial muscles, periodontal as well as occlusion. In this population, there is a higher prevalence of bruxism in those individuals of preschool age, although it also occurs in older children and permanent dentition. This prevalence is due to the structural and functional characteristics of deciduous dentition (DINIZ *et al.*, 2009). The treatment of this disorder varies according to its origin, since it is a multifactorial situation. Thus, therapy may include dentistry, medicine, psychology and physiotherapy. This multidisciplinary is since the treatment plan should adopt as its main objectives the minimization of emotional tension, treat the signs and symptoms and restore the stomatognathic apparatus (SILVA; CANTISANO, 2009; DINIZ *et al.*, 2009). Due to this growth factor, a constant search for knowledge about bruxism is necessary for its treatment to become ever earlier and more efficient. In this sense, this paper aims to search articles in databases and to raise as much as possible, to discuss the subject with greater scientific relevance.

METHODOLOGY

This study is a literature review based on scientific articles on bruxism in children. Researches related to the selected theme were searched. For searching the articles, the following online databases were used: PubMed (<https://www.ncbi.nlm.nih.gov/pubmed/>), Lilacs (<http://lilacs.bvsalud.org/>), Bireme (<https://bvsalud.org/>); and the library collection of Faculdade Independente do Nordeste. We searched scientific articles, abstracts, monographs, theses and books for the last 10 years, using the following descriptors to find the articles: "Bruxism", "Stomatognathic System", "Pediatric Dentistry", and "Children". Thirty-one articles were selected for this classic literature review, focusing on the objective of the present study.

Literature review

Parafunctional habits are situations characterized by an abnormality in the stomatognathic system. Being characterized by the act of clenching and grinding the teeth and sometimes without patient awareness. These situations can become frequent during sleep, wakefulness, or even both. These parafunctions can be classified into several types, depending on their specific characteristics. Bruxism is the most common type and it has become more usual, especially in children (PIZZOL *et al.*, 2006; PRIMO *et al.*, 2009; BECKER, 2014).

Bruxism concept

Bruxism is considered a parafunctional habit because it is an involuntary and unconscious disorder. This situation is characterized especially by the clenching and / or grinding of the dental elements. Situations which will define which type of bruxism the patient presents, being used for the first case the term 'eccentric bruxism' and for the second the term employed is 'centric bruxism' (MACIEL, 2010; SCOCATE *et al.*, 2012; MORAIS *et al.*, 2015; BRITO *et al.*, 2017). According to the American Academy of Sleep Medicine (2006), bruxism is among the movement-related sleep disorders. It is mainly

characterized by oral hyperactivity, either grinding or clenching teeth during sleep.

Epidemiology and prevalence of bruxism

Bruxism affects about 15% of the world's population in a comprehensive way. When it comes to children, specifically, the literature has shown that there is considerable variation, between 5% and 81%. This is because studies addressing this theme do not standardize their methodologies, thus having differences in age groups, as well as differences in questionnaires, interviews or even combinations of methods (OLIVEIRA, 2006; PRIMO *et al.*, 2009; GAMA *et al.*, 2013). Studies by Tokunsky e Silva (2012) and Serra Negra (2013) analyzed the prevalence of bruxism in children with only deciduous and mixed dentition, finding results that show that in these groups the risk of having this parafunction becomes higher. In a 2012 study in which 937 children aged 2 to 6 years were evaluated, the authors found that of these 27.3% had bruxism at night and 2% during the day, representing 271 children with this parafunctional habit (SCOCATE *et al.*, 2012).

Signs and Symptoms of Bruxism

The most evident clinical signs of bruxism are abnormal tooth wear, associated sounds and muscle discomfort in the mandibular region, specifically in the temporomandibular joint (TMJ). The literature has also shown other signs that may appear, but less frequently: muscle hypertrophy, crack formation, cervical erosion, coronary or restorative fractures (SCOCATE *et al.*, 2012; GAMA *et al.*, 2013). Regarding symptoms, the painful condition may not always be associated with the patient's main complaint. Nevertheless, pain may appear accompanied and may manifest in muscles, TMJ and even dental elements (DINIZ *et al.*, 2009; PRIMO *et al.*, 2009; GAMA *et al.*, 2013).

Consequences related to bruxism

Bruxism can have several consequences, because it is a parafunctional situation of the masticatory system. In the case of children, studies point to the following consequences: tooth wear, dentin sensitivity, tooth mobility, soft tissue trauma, headaches, muscle sensitivity (specifically in the chewing muscles) and disease onset and / or progression of periodontal disorders, as well as TMJ disorders (PIZZOL *et al.*, 2006; OKESON, 2008). Other authors also address other consequences of bruxism in childhood, such as loss of vertical dimension. In addition, this habit may be related to disorders involving the ear tube, such as cases of chronic otitis media (CARIOLA, 2006; PIZZOL *et al.*, 2006).

Bruxism diagnosis

Like any other variation in normality, bruxism must be accurately evaluated and diagnosed, given its broad power to affect important structures of the stomatognathic system. In this way, the most common form, among several present in the literature, is the questionnaire, as shown in table 01. However, this can become a challenge for cases of bruxism in childhood, given the impossibility for several reasons; this technique can be used in an extremely young audience. Associated to this technique the professionals of the area (Dentists) to the clinical

examinations and observation of the dental elements, as for the wear presented (KOYANO *et al.*, 2008; BECKER, 2014; MANFREDINI, 2011).

Table 1. Questionnaire to detect bruxism

Has anyone ever told you if you grind and / or clench your teeth at night?
Do you feel tired or sore when you wake up in the morning?
Do you sometimes have sore teeth or gums when you wake up in the morning?
Have you ever experienced headaches in the temporal zone in the morning when you wake up?
Have you noticed that during the day you usually grind your teeth?
Have you noticed that during the day you usually clench your teeth?

Source: Pestana, 2014

For clinical evaluation, especially in children, the American Academy of Sleep Medicine (2006) recommends that certain criteria must be taken into account for the diagnosis of bruxism to be proven. Thus, the dentist should note the wear on the incisal surfaces of anterior teeth, occlusal wear on the posterior teeth, reports of parents and / or guardians of constant teeth-grinding noises during sleep, Alba line in the jugal mucosa, and teeth impression in the tongue. Other methods may be used such as electromyography, although their availability is not satisfactory; polysomnography, which is considered a 'gold standard' for the diagnosis of this parafunctional habit (BECKER, 2014).

Etiology of bruxism

Some studies show that the etiology of bruxism is still inconclusive; in fact, what happens is an association of factors, making the pathology multifactorial. These items can be classified in several ways, such as dental or local, psychological and emotional, systemic, occupational, idiopathic, hereditary, occupational and even nutritional (GONÇALVES *et al.*, 2010; GAMA *et al.*, 2013; MORESCA, 2014).

- **Local Factors:** These factors are associated with dental elements, in this sense include malocclusions, trauma, premature contact, resorption, dental calculus, cysts, edentulous area, excess restorative material and muscle tension. In the case of childhood bruxism, the local factor may be related after the eruption of the central incisors, which may cause gingival lacerations in cases of unerupted antagonist elements (GONÇALVES *et al.*, 2010; GAMA *et al.*, 2013);
- **Psychological Factors:** Such as strong emotions, tensions, family problems, depression, among others (GONÇALVES *et al.*, 2010). In anxiety-related cases, it is observed that bruxism actually becomes an escape response, as the mouth has a high affective potential, and is a place of expression and repressed impulses, emotions and conflicts (ZENARI e BITAR, 2010);
- **Systemic Factors:** The literature states that changes in the digestive tract are potential for the emergence of bruxism. As well as nutritional and vitamin deficiencies, allergies, ENT disorders, endocrine disorders and even some syndromes like Down's (GAMA *et al.*, 2013);
- **Occupational Factors:** Related to Physical, Professional and Mental Activities (SILVA e CANTISANO, 2009);
- **Hereditary Factors:** There are studies that show that there is a relationship between bruxism and a certain genetic predisposition, although the mode of transmission is unknown (DINIZ *et al.*, 2009).

Bruxism Treatment

Due to its multifactorial etiology, there are differences in its treatment. However, there are some difficulties when it comes to treating bruxism in children, and there is still much controversy on the subject. Evidence, on the other hand, has shown that the habit of bruxism persists from childhood to adulthood, hence the importance of treatment as a child (RESTREPO *et al.*, 2009; GAMA *et al.*, 2013). The most common form of treatment for bruxism is occlusal splint; however, this method has been poorly tested and studied in children due to the paradigm of restricted growth of the alveolar-maxillary process. This therapy works more as a dental protector than in reducing bruxism (LOBEZZO *et al.*, 2008). In a 2011 study, they evaluated the effectiveness of occlusal splint in reducing signs and symptoms of temporomandibular disorders (TMDs), tooth wear, and anxiety in children. However, it was evident that rigid occlusal splint are not efficient in reducing bruxism signs (RESTREPO *et al.*, 2011). In another study by the same authors, they showed that there is an effectiveness of the association of techniques (muscle relaxation and competent reaction) in children with bruxism. In this study, Restrepo *et al.* (2001) evaluated 33 children aged 3 to 6 years, with the combination of techniques such as therapy, with a significant reduction in anxiety and TMD. The literature also states that positive adenotonsillectomy treatments have been reported in children with bruxism associated with systemic problems (DiFRANCESCO *et al.*, 2004; EFTEKHARIAN *et al.*, 2008). Gama *et al.* (2013) consider that in some cases it is necessary to perform occlusal adjustments, orthodontic treatments, and use of drugs (analgesics, anti-inflammatory drugs, myorelaxant, benzodiazepines, anticonvulsants, blocking betas, dopaminergic agents and antidepressants). The authors also state that in certain cases psychological counseling is required. This consists in an attempt to reduce and control the psychological stress of the patient. From another perspective, the authors mention phytotherapy as a substantial treatment in cases of TMD and bruxism (GAMA *et al.*, 2013).

Conclusion

Bruxism has become increasingly common, especially in children. In this way, it is the role of the dentist to be able to make a good diagnosis through the signs and symptoms, identifying the problem, informing the patient and / or parents / legal guardians of the severity of each case. Thus, it is inferred that regardless of the etiology related to each case, the appropriate therapy should be individualized, especially in children.

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