

Alarming Aspects of Bruxism: A Review

Nithyaja B J¹ Kiran Kumar N² Hariprasad L^{3*} Anjum Afshan⁴ Priya Mariam Thomas⁵
Guruprasad⁶

¹BDS Dental Surgeon, Department of Orthodontics, Jayanagar Government Hospital, Bangalore, Karnataka, India.

²Professor and Head, Department of Conservative Dentistry and Endodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

³PG Student, Department of Conservative Dentistry and Endodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

⁴MDS, Prosthodontics and Implantology, M S Ramaiah Dental College, Bangalore, Karnataka, India.

⁵PG Student, Department of Conservative Dentistry and Endodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

⁶Associate Professor, Department of Periodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

ABSTRACT

Background: Bruxism in children is an alarming and a profound parafunctional behaviour. The causative factors can be multifactorial and overlapping in paediatric patients, which make it complex in treating, applying a comprehensive and an effective treatment plan for this masticatory destructive habit. This article reviews and summarizes the aetiology, pathophysiology and conservative treatment approaches to Bruxism in children. This review literature was written after obtaining adequate articles on the search engines, PubMed, PubMed Central, Google Scholar after entering the Keywords.

Keywords: Bruxism, Teeth Grinding, Bruxism in Children.

INTRODUCTION

Bruxism is a catastrophic habit that is defined as the non-productive diurnal and nocturnal clenching or grinding of the teeth.¹ It is an involuntary, excessive grinding, clenching or rubbing of teeth during non-functional movements of the masticatory system. Usually patients gnash and clench their teeth during sleep involuntarily as well as they clench their teeth throughout the day.²

Bruxism is derived from the Greek word "Brychein" meaning tooth grinding. The international classification for sleep disorders reclassified Bruxism as a sleep related disorder in 2005 rather than it was before classified as Parasomnia, in which undesirable movements of the jaws are noted during sleep.

PREVALENCE OF BRUXISM:

Prevalence reported in children is estimated to range from 14% to 44.6%.^{3, 4} A few number of studies confirm an increased prevalence in females compared with males.^{5, 6} Abreu et al¹¹ conducted studies in 2016 reported a prevalence of 40% in preschoolers aged 3-6 years, from 17% in the age range of 6-7 years and 24% in the age range of 8-9 years. However, as Bruxism is a condition related to personality traits, aggression, mood swings, anxiety, irritability, attention deficit and hyperactivity can be triggered by life events. But a significant difference between genders is unlikely in response to these life events. In children, bruxism can be noticed as grinding their teeth throughout the entire day (AWAKE BRUXISM) and/or night (SLEEP BRUXISM). Although, a previously done study showed no significant differences in the comparison

Received: July. 6, 2020; Accepted: Aug. 16, 2020

*Correspondence Dr. Hariprasad L.

Department of Conservative Dentistry and Endodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

Email: hariprasaddl6789@gmail.com

of groups with sleep bruxism to those with awake bruxism.¹⁹

ETIOLOGY AND PATHOPHYSIOLOGY OF BRUXISM IN CHILDREN: LITERATURE REVIEW

The causes of bruxism can be multifactorial and overlapping in paediatric patients making it complex in treating and applying comprehensive and an effective management plan for this masticatory parafunctional behaviour. Bruxism is considered as the most harmful functional disorder to the teeth.

In adults, Bruxism is an expression of a combination of occlusal and psychic factors. But in children, Bruxism can be manifested as a result of several underlying factors and consequences of life events that can be preceded due to anxiety, attention deficit and certain psychological behaviors. In babies, Bruxism can be observed shortly after the eruption of deciduous incisors in around one year of age.

According to Lobbezoo and Naeije et al⁸ levels of personality and stress type have been included in the etiology of bruxism since several years. But however, these general underlying factors are debatable. A controlled questionnaire study conducted by Olkinuora et al⁹ revealed that bruxism generally presents an emotional imbalance in young children and this may lead to development of more psychosomatic disorders.

There is also evidence that children with Bruxism may be subjected to the immaturity of the masticatory neuromuscular system. This was tested by Vandeweyer et al⁷ where they demonstrated anxiety and stress are directly related to bruxism as patients with Bruxism show increased catecholamine levels, generally ascribed to emotional stress.

The factors contributing to tooth wear and chemical dissolution of enamel in children can be as a result of an acid diet, medical history of gastro-esophageal reflux younger individuals or certain medications¹⁰ like Propranolol and catecholamines may influence as a cause of bruxism.¹²

Intestinal parasites have also been pointed as etiological agents, causing bruxism in young children. But there have been varied opinions on

this. In Brazil Rodriguez et al¹³ enumerated no difference between patients with or without bruxism in relation to infestation of intestinal parasites in children aged 6-11 years. However, in India the researchers concluded that in children between 3-6 years of age these parasites may be the cause of onset of bruxism.

An observation has been made in several studies with an association between presence of bruxism and oral respirators. This interrelation is very strong in children with respiratory disorders. Mouth breathing is a parafunctional habit where the child breathes predominantly through the mouth due to anatomic constraints or pathological causes like enlarged tonsils.¹⁴

Mouth breathing is an aggravation of pre-existing sleep bruxism.^{15, 16} The relationship between these conditions may be positive because children with respiratory disorders, in order to improve air passage, they tend to throw the lower jaw bone ahead, which can stimulate superior airways receptors for intensifying the airways tonus which may cause bruxism. The presence of bruxism and mouth breathing can lead to craniofacial and postural changes, as well as problems with facial muscles, occlusion, chewing, swallowing, sleep concentration and attention. Thus, studying and observing these variables is of great importance in early diagnosis.

It has been suggested that Bruxism appears to be common in children with Autism, Down's syndrome, cerebral palsy and developmental disabilities specifically in severe mental retardation than in other populations.¹⁷

CONSEQUENCES OF BRUXISM:

It is well established that Sleep Bruxism has a central and non-peripheral origin and that its pathophysiology involves the dopaminergic system, altering its physiological parameters causing a great concern to the stomatognathic system.¹⁸ Thus Bruxism can not only entail changes on the teeth that are getting worn out but also on the other elements of the stomatognathic system, causing an imbalance. Thus, the knowledge and awareness of these causative factors and clinical characteristics of Bruxism in childhood is essential to the possibility

of an early diagnosis and prompt multidisciplinary approach.

TREATMENT OF BRUXISM IN CHILDREN:

Various theories regarding the etiology of bruxism have been reported and they fall into the categories of: psychological, occlusion related and originating within the central nervous system. Before instituting any therapeutic measures, the practitioner must look at all the medical and dental data particularly because the etiology of bruxism is multifactorial and deep rooted.²

Therapeutic approaches can include occlusal adjustments or use of inter-occlusal appliances. But, however the construction of bite plates is difficult due to the complex molding stages and the establishment of centric occlusion in these patients. Moreover, the use of plate itself poses problems, as the craniofacial growth pattern follows a chronological pattern and growth of dental arches is not yet complete in children. This may cause the fabricated plate to break or even be swallowed if it is too thin.¹⁹

A soft material can be chosen to protect and cover the primary teeth to prevent its continuous abrasion as suggested by Casamassino. Furthermore, the thickness of 3mm is sufficient to prevent perforation and increase resistance to impact.²⁰

Rapid palatal expansion to treat children in cases of Bruxism associated with sleep pattern disturbances and apnea syndrome, the aim is to increase the size of the airway, improving breathing and reducing parafunction.²¹

The treatment of bruxism with behavioral management such as for anxiety control or sleep pattern improvement has to be diligently done. As many parents are not cognizant of the parafunctional behavior of their young children, these causative factors of bruxism are usually misconceived. Hence, parental counseling and awareness can benefit multifold in the treatment of this parafunctional behavior.

As for the use of pharmaceuticals for the treatment of bruxism in children, it can be selectively done with calculated usage of Benzodiazepines, beta blockers, antidepressants and Muscle relaxants. No

drug is considered as a first choice and should be used for a short notice.²²

Thus, understanding the factors associated with this parafunctional condition in a group that poses particular challenges to dental care becomes important to establish the best treatment approach.

CONCLUSION

Bruxism poses a huge risk for the complete stomatognathic and emotional development in young children. Etiology of bruxism in pediatric patients is multifactorial and deep-rooted. Thus, identifying and making the accurate diagnosis is essential for a prompt multidisciplinary treatment approach.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Pingitore G, Chrobak V, Petrie J. The social and psychological factors of bruxism. *J prosthet dent* 1991; 65(2):443-6.
2. Antonio A G, Silva Pierro V, Maia L C. *J Can Dent Assoc* 2006; 72(2):155-60.
3. Laberge L, Tremblay RE, Vitaro F, Montplaisir J. Development of parasomnias from childhood to early adolescence. *Pediatrics* 2000; 106(1 Pt 1):67-74.
4. Nilner M. Prevalence of functional disturbances and diseases of the stomatognathic system in 15-18 year olds. *Swed Dent J* 1981; 5(5-6):189-97
5. Bayardo RE, Mejia JJ, Orozco S, Montoya K. Etiology of oral habits. *ASDC J Dent Child* 1996; 63(5):350-3.
6. Gorayeb MA, Gorayeb R. [Association between headache and anxiety disorders indicators in a school sample from Ribeirao Preto, Brazil]. *Arq Neuropsiquiatr* 2002; 60(3-B):764-8. Portuguese.
7. Vanderas AP, Menenakou M, Kouimtzi TH, Papa Giannoulis L. Urinary catecholamine levels and bruxism in children. *J Oral Rehabil* 1999; 26(2):103-10.

8. Lobbezoo F, Naeije M. Bruxism is mainly regulated centrally, not peripherally. *J Oral Rehabil* 2001; 28(12):1085-91.
9. Hedge SV, Munshi AK. Late development of supernumerary teeth in the premolar region: a case report. *Quintessence Int* 1996; 27(7):479-81
10. Lussi A, Kohler N, Zero D, Schaffner M, Megert B. A comparison of the erosive potential of different beverages in primary and permanent teeth using an in vitro model. *Eur J Oral Sci* 2000; 108(2):110-4.
11. Abreu LG, Paiva SM, Pordeus IA, Martins CC. Breastfeeding, bottle feeding and risk of malocclusion in mixed and permanent dentitions: a systematic review. *Braz Oral Res* [online]. 2016;30(1):e22
12. Narbutyte I, Narbutyte A, Linkeviciene L. Relationship between breastfeeding, bottle-feeding and development of malocclusion. *Stomatologija*. 2013;15(3):67-72.
13. Wells GA, Shea B, O'Connell D, Peterson J, Welch V, Losos M, et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses [Internet]; Ottawa: Ottawa Hospital Research Institute; 2009 [cited 2013 Dec 15]. Available from: www.ohri.ca/programs/clinical_epidemiology/oxford.htm.
14. Soares P, Klein D, Ximenes M, Pereira C S, Cristina Antunes E, Dias L, Borgatto A, Cardoso M, Bolan M. Mouth Breathing and Prevalence of Sleep Bruxism among Preschoolers aged 2 to 5 years. *Pesq Bras Odontoped Clin Integr* 2018, 18(1):e3490.
15. Drumond CL, Souza, DS, Serra-Negra JM, Marques LS, Ramos-Jorge ML, Ramos-Jorge J. Respiratory disorders and the prevalence of sleep bruxism among schoolchildren aged 8 to 11 years. *Sleep Breath* 2017; 21(1):203-8. doi: 10.1007/s11325-017-1466-9.
16. Simões-Zenari M, Bitar ML. Factors associated to bruxism in children from 4-6 years. *Pro Fono* 2010; 22(4):465-72. doi: 10.1590/S0104-56872010000400018
17. Idiberto José Zotarelli Filho., et al. "Pediatric Bruxism: From Etiology to Treatment: A Review". *Acta Scientific Dental Sciences* 2.3 (2018): 17-20.
18. Sampaio N M, Oliveira MC, Andrade A C, Santos B Y, Sampaio M, Ortega A. Relationship between stress and sleep bruxism in children and their mothers: A case control study. *Sleep Sci*. 2018;11(4):239-244.
19. Souzav, Abreu M H, Resende L S, Castilho L S. Factors associated with bruxism in children with developmental disabilities. *Braz Oral Res* [online]. 2015;29(1):1-5.
20. Casamassimo P. Periodontal considerations. In: Pinkham J, Casamassimo OS, Fields HW, McTigue DJ, Nowak A, editors. *Pediatric dentistry — infancy through adolescence*. 2nd ed. Philadelphia: WB Saunders Co.; 1994. p.372.
21. McDonald RE, Hennon DK, Avery DR. Diagnosis and correction of minor irregularities in the developing dentition. In: McDonald RE, Avery DR, Dean JA, editors. *Pediatric dentistry for the child and adolescent*. 7th ed. Chicago: Mosby; 2000. p. 487.
22. Almilhatti HJ., et al. "Como aumentar o índice de sucesso no tratamento com placas oclusais miorrelaxantes". *Jornal Brasileiro de Oclusão, Atm e Dor Orofacial* 2.8 (2002): 340- 343.
23. Alóe F., et al. "Bruxismo durante o sono". *Revista Neurociências* 11.1 (2003): 4-17.
24. Goyatá FR., et al. "Avaliação de sinais e sintomas de disfunção temporomandibular entre os acadêmicos do curso de odontologia da universidade Severino sombra, VassourasRJ". *International Journal of Dentistry* 4.9 (2010): 181-186.