ORIGINAL ARTICLE

Risk factors of bruxism in children and adolescents: A case-control study

How to Cite This Article: Talebian A, Sharif MR, Gilasi HR, Ghafeli Bidgoli M, Masoudi Alavi N .Risk factors of bruxism in children and adolescents: A case-control study. Iran J Child Neurol. Summer 2023; 17 (3): 81-87

Ahmad TALEBIAN MD[1], Mohammad Reza SHARIF MD[2], Hamid Reza GILASI PhD[3], Morteza GHAFELI BIDGOLI MD[1], Negin MASOUDI ALAVI PhD[4]

1. Department of Pediatrics, Kashan University of Medical Sciences, Kashan, Iran,
2. Department of Pediatrics, Infectious Disease Research Center, Kashan University of Medical Sciences, Kashan, Iran.
3. Department of Epidemiology and Biostatistics, Kashan University of Medical Sciences, Kashan, Iran.
4. Department of Medical Surgical Nursing, Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, Iran.

Corresponding Author
Masoudi Alavi N .PhD
Kashan University of Medical Sciences, Ghotb Ravandi Highway, Kashan, Iran
Email: alavi.negin@yahoo.com

Abstract

Objectives

This study aimed to investigate the risk factors of bruxism in children and adolescents under 15 years old in Iran.

Materials & Methods

This case-control study was conducted in day clinics of Shahid Beheshti Hospital in 2020. Fifty children with bruxism in the case group and 50 without in the control group were compared to five risk factors, including intestinal parasites, sucking the fingers, biting objects, a family history of bruxism, and secondhand smoking (SHS). The statistical tests of smoking, odds ratio, and logistic regression were used for data analysis.

Results

The mean age of the subjects was 10.6±3.2 and 10.8±2.9 years in the case and control groups, respectively. The bruxism showed significant relation with sucking the fingers, the family history of bruxism, and intestinal parasites. The SHS and biting objects showed no significant relation with bruxism. The logistic regression indicated that the study variables could explain the 22.6 to 30.1% of risk factors in bruxism.

Conclusion

Bruxism is a common disorder in children and adolescents. The intestinal parasites might be associated with bruxism. These infestations should be diagnosed and treated in children with bruxism.

Received: 28- Apr-2021
Accepted: 09- May-2022
Published: 01-Jul-2023

Keywords: Children, Adolescents, Bruxism, Risk Factors
DOI: 10.22037/ijcn.v17i2.34695

Introduction

Bruxism is defined as a repetitive jaw-muscle activity characterized by clenching or grinding the teeth and/or bracing or thrusting the mandible. Bruxism can be seen in sleep bruxism and awake bruxism (1). The prevalence has been estimated at approximately 8–10% in the general adult population (2). The prevalence of bruxism has been highly variable in children. A review study reported a prevalence between 3.5 to 40.6% in children, with a commonly described decrease with age (3). Another systematic review estimated that the prevalence of sleep bruxism ranged from 5.9% to 49.6% in children and suggested that these variations might be associated with the diagnostic criteria (4). The etiology is multifactorial: mainly central (neuropathic disorder, anxiety) but also genetic and local (posture, mouth breathing) (5). Some suggest that bruxism neither a parasomnia nor a purely mechanical or psychological issue. Currently, it is considered primarily a sleep-related movement disorder with other multifactorial etiologies involving complex multisystem physiological processes (6).

Non-instrumental approaches (notably self-report) and instrumental approaches (notably electromyography) can be employed to assess bruxism (7). Bruxism can induce tooth-wearing, but it is still much more than that. It is currently linked to orofacial pain, headaches, sleep, and behavior disorders (8). Children and adolescents with bruxism usually need evaluation for other medical comorbidities such as sleep breathing problems, insomnia, attention deficit hyperactivity disorder, depression, moodiness, and gastroesophageal reflux disease (GERD) (9). Bruxism can have consequences in children and is related to the development of temporomandibular disorders (TMD) (10).

There are many treatments for bruxism and its associated headaches. Medications such as (hydroxyzine /trazodone /flurazepam), occlusal splints, orthodontic interventions, and psychological and physical therapy interventions have been used to treat bruxism. Alternative treatments, such as medicinal extracts of Melissa officinalis-L, also have been used for treatment (11). Hydroxyzine therapy showed the most vital efficacy on sleep bruxism, while Flurazepam and Melissa officinalis therapies presented lower effects on bruxism symptoms (12).

A systematic review and meta-analysis have reported many risk factors for bruxism in children, including gender (male), age, gene, anxiety, stress, secondhand smoke (SHS), high psychological reactions, moving a lot during sleep, sleeping with mouth open, snoring loudly, restless sleep, sleep hours, sleep with the light on, noise in the room, headache, biting, cheeks tonus, peer problems, emotional symptoms, birth weight, hyperactivity, and family income (13). Another systematic review found a relationship between sleep bruxism, SHS, and neuroticism in children (14). Stressed individuals showed a higher chance of presenting bruxism than healthy individuals (15).

There are a small number of studies with the

primary objective of assessing bruxism in children, and there are still many questions about the exact prevalence, etiology, treatment, and risk factors of bruxism in children and adolescents. Using the case-control methodology, this study was designed to determine the risk factors of bruxism in children and adolescents under 15 years old.

Material & Methods

Study design and sampling

This case-control study was conducted in the day clinics of Shahid Beheshti Hospital in 2020. All the children and adolescents under 15 years old referring to the clinic with the diagnosis of bruxism were recruited to the study as the case group. Fifty subjects entered the case group. The 50 healthy children and adolescents without any signs or symptoms of bruxism referring to the clinics were selected conveniently as the control group. Five risk factors were studied in this research; the 50 subjects represent ten subjects for each risk factor, which seems adequate. The inclusion criteria were less than 15 years old, a definite diagnosis of bruxism in the case group, and the willingness of children and their guardians to participate in the study. Children with mental retardation or behavioral disorders such as autism were excluded from the study.

Data gathering: The subjects in both case and control groups were evaluated for intestinal parasites, sucking the fingers, biting objects, a family history of bruxism, and SHS. The stools of the subjects were studied for intestinal parasites in the hospital laboratory affiliated with Shahid Beheshti hospital. The sex and age of the children and adolescents also were recorded. A questionnaire containing the mentioned variables was developed to show acceptable internal consistency with 0.95 Cronbach's alpha.

Data analysis: The frequencies of the risk factors and variables were reported. The chi-square, odds ratio, and logistic regression statistical tests were used for data analysis. All the analysis was done with SPSS software version 16.

Ethical considerations: The research was approved by the Ethics Committee of Kashan University of Medical Sciences with ethical code: IR.KAUMS.NUHEPM.REC.1396.18. The study's objective was explained to the children and their guardians, and the guardians completed written informed consent. The participants were assured that participating in the study would not influence their treatments. The ethical codes suggested in the Helsinki Declaration have been respected in this study.

Results

The mean age of the subjects was 10.6±3.2 and 10.8±2.9 in the case and control groups, respectively. In the case group, there were 20 girls and 30 boys. The control group contained 22 girls and 28 boys ($p \geq 0.05$). The bruxism showed significant relation with sucking the fingers, the family history of bruxism, and intestinal parasites. The SHS and biting objects did not show a significant relation with bruxism. (Table 1). The logistic regression showed that the study variables could explain the 22.6 to 30.1% of risk factors in bruxism (Table 2).

Table 1. The frequencies and odds ratio of risk factors in the children and adolescents with bruxism in case group and control group

Risk Factors	Case group	Control group	Odds ratio
Sucking the fingers	32 (64%)	21 (42%)	1.52*
Chewing materials	30 (60%)	22 (44%)	1.36
Family history	35 (70%)	16 (32%)	2.187*
Intestinal parasites	31 (62%)	21 (42%)	1.47*
Second hand smocking	26 (52%)	25 (50%)	1.04

Significant relation*

Table 2. The logistic regression of risk factors in case and control groups

Risk factors	B	Standard Error	Wald statistic	P value	Odds Ratio
Sucking the fingers	1.181	0.493	5.782	0.016	3.273
Chewing materials	0.749	0.523	2.045	0.153	2.114
Family history	1.669	0.474	12.375	0.000	5.307
Intestinal parasites	0.540	0.477	1.281	0.258	1.716
Second hand smocking	0.251	0.496	0.257	0.612	1.286

Discussion

In the current study, a significant relation was found between sucking fingers, family history of bruxism, intestinal parasites, and bruxism, while this study found no significant relation between bruxism and biting objects and SHS. A study showed a relationship between biting objects, especially pens and pencils, and sleep and awake bruxism in children (16). Another study also showed a relationship between bruxism, parafunctional habits (nail/pen/pencil/lip/cheek biting, resting one's head on one's hand, and gum chewing), and painful temporomandibular disorders in adolescents (17). In a study, the prevalence of sleep bruxism was 27.8% among the examined children. Only oral breathing was statistically associated with sleep bruxism with an odds ratio of 2.71 (18). Another study indicated that sleep bruxism was significantly more prevalent in children with a history of nail-biting and biting objects and less prevalent among girls (19),. In the present study, the subjects in the control group were selected with the same age and gender as the case group. Thus, this research could not analyze the relation of these variables with bruxism. As mentioned earlier, the studies show that parafunctional habits such as biting objects and sucking fingers have significant relation with bruxism. This study found this relationship only in sucking fingers, not biting objects.

A study showed that a history of bruxism in parents was significantly related to bruxism in children and suggested that bruxism tends to be hereditary (20). A study found certain genes that were related to the occurrence of bruxism in children (21). A review of the literature except one study showed that bruxism seems to be genetically determined. Parents should be informed that teeth-grinding is more common in families with a positive history of bruxism (22).

The current study found a significant relationship between intestinal parasites and bruxism in children. There are few studies about infestations and bruxism. There is uncertainty about the relationship between intestinal parasites and bruxism. A study found no relationship between bruxism and intestinal parasites in 4964 children aged three to six (23). Another study also did not support an association between intestinal parasitic infestation and bruxism among the evaluated pediatric population (24). However, Tehrani et al., like the current study, found a statistically significant relationship between infection with pathogenic parasites and bruxism in Iran (25). It seems this subject needs further investigation.

Some studies have reported a significant relationship between SHS and bruxism in children (14, 26), although this study did not find such a relationship. The diagnosis of bruxism in children is mainly based on parents' reported signs and symptoms. A study showed that proxy-reported sleep bruxism differed for each socioeconomic layer (27). Another study also indicated no association between parental reports and objective assessment of rhythmic masticatory muscle activity in children with bruxism, suggesting the need to improve parental knowledge of children's bruxism (28). The parents might underreport the symptoms, or be more aware of some problems. This is an essential limitation in studies of bruxism in children.

Acknowledgment

The study was taken from an MD degree thesis that was financially supported by Kashan University of Medical Sciences. The authors are grateful to the children and their guardians participating in this study. The authors would like to thank the Deputy of Research, Kashan University of Medical Sciences, for supporting this study R.KAUMS. NUHEPM.REC.1396.18.

Author's contribution

Dr. Ahmad Talebian: Development of original idea, study concept, and design; Dr. Mohamad Reza Sharif: Study concept and design, writing, and revision of the manuscript; Dr. Hamid Reza Gilasi: Statistical analysis; Dr Morteza Ghafeli Bidgoli: Collecting data; Dr. Negin Masoudi Alavi: Data analysis, and preparing the manuscript.

Conflict of interest

The authors have declared no competing or potential conflicts of interest

Reference

1. Lobbezoo F, Ahlberg J, Glaros AG, Kato T, Koyano K, Lavigne GJ, et al. Bruxism defined and graded: an international consensus. Journal of oral rehabilitation. 2013;40(1):2-4.
2. Lobbezoo F, van der Zaag J, van Selms MK, Hamburger HL, Naeije M. Principles for the management of bruxism. Journal of oral rehabilitation. 2008;35(7):509-23.
3. Manfredini D, Restrepo C, Diaz-Serrano K, Winocur E, Lobbezoo F. Prevalence of sleep bruxism in children: a systematic review of the literature. Journal of oral rehabilitation. 2013;40(8):631-42.
4. Machado E, Dal-Fabbro C, Cunali PA, Kaizer OB. Prevalence of sleep bruxism in children: a systematic review. Dental press journal of orthodontics. 2014;19(6):54-61.
5. Camoin A, Tardieu C, Blanchet I, Orthlieb JD. [Sleep bruxism in children]. Archives de pediatrie : organe officiel de la Societe francaise

de pediatrie. 2017;24(7):659-66.
6. Klasser GD, Rei N, Lavigne GJ. Sleep bruxism etiology: the evolution of a changing paradigm. Journal (Canadian Dental Association). 2015;81:f2.
7. Lobbezoo F, Ahlberg J, Raphael KG, Wetselaar P, Glaros AG, Kato T, et al. International consensus on the assessment of bruxism: Report of a work in progress. Journal of oral rehabilitation. 2018;45(11):837-44.
8. Firmani M, Reyes M, Becerra N, Flores G, Weitzman M, Espinosa P. [Sleep bruxism in children and adolescents]. Revista chilena de pediatria. 2015;86(5):373-9.
9. Saulue P, Carra MC, Laluque JF, d'Incau E. Understanding bruxism in children and adolescents. International orthodontics. 2015;13(4):489-506.
10. de Oliveira Reis L, Ribeiro RA, Martins CC, Devito KL. Association between bruxism and temporomandibular disorders in children: A systematic review and meta-analysis. International journal of paediatric dentistry. 2019;29(5):585-95.
11. Chisini LA, San Martin AS, Cademartori MG, Boscato N, Correa MB, Goettems ML. Interventions to reduce bruxism in children and adolescents: a systematic scoping review and critical reflection. European journal of pediatrics. 2020;179(2):177-89.
12. Ierardo G, Mazur M, Luzzi V, Calcagnile F, Ottolenghi L, Polimeni A. Treatments of sleep bruxism in children: A systematic review and meta-analysis. Cranio : the journal of craniomandibular practice. 2021;39(1):58-64.
13. Guo H, Wang T, Niu X, Wang H, Yang W, Qiu J, et al. The risk factors related to bruxism in children: A systematic review and meta-analysis. Archives of oral biology. 2018;86:18-34.
14. Castroflorio T, Bargellini A, Rossini G, Cugliari G, Rainoldi A, Deregibus A. Risk factors related to sleep bruxism in children: A systematic literature review. Archives of oral biology. 2015;60(11):1618-24.
15. Chemelo VDS, Né YGS, Frazão DR, de Souza-Rodrigues RD, Fagundes NCF, Magno MB, et al. Is There Association Between Stress and Bruxism? A Systematic Review and Meta-Analysis. Frontiers in neurology. 2020;11:590779.
16. Serra-Negra JM, Paiva SM, Auad SM, Ramos-Jorge ML, Pordeus IA. Signs, symptoms, parafunctions and associated factors of parent-reported sleep bruxism in children: a case-control study. Brazilian dental journal. 2012;23(6):746-52.
17. Fernandes G, Franco-Micheloni AL, Siqueira JT, Gonçalves DA, Camparis CM. Parafunctional habits are associated cumulatively to painful temporomandibular disorders in adolescents. Brazilian oral research. 2016;30. :S1806-83242016000100214.
18. Lamenha Lins RM, Cavalcanti Campêlo MC, Mello Figueiredo L, Vilela Heimer M, Dos Santos-Junior VE. Probable Sleep Bruxism in Children and its Relationship with Harmful Oral Habits, Type of Crossbite and Oral Breathing. The Journal of clinical pediatric dentistry. 2020;44(1):66-9.
19. Drumond CL, Ramos-Jorge J, Vieira-Andrade RG, Paiva SM, Serra-Negra JMC, Ramos-Jorge ML. Prevalence of probable sleep bruxism and associated factors in Brazilian schoolchildren. International journal of paediatric dentistry. 2018 ;29(2):221-7.

20. Serra-Negra JM, Ribeiro MB, Prado IM, Paiva SM, Pordeus IA. Association between possible sleep bruxism and sleep characteristics in children. Cranio : the journal of craniomandibular practice. 2017;35(5):315-20.
21. Vieira AR, Scariot R, Gerber JT, Arid J, Küchler EC, Sebastiani AM, et al. Bruxism Throughout the Lifespan and Variants in MMP2, MMP9 and COMT. Journal of personalized medicine. 2020;10(2).
22. Lobbezoo F, Visscher CM, Ahlberg J, Manfredini D. Bruxism and genetics: a review of the literature. Journal of oral rehabilitation. 2014;41(9):709-14.
23. Hajenorouzali Tehrani M, Sadri L, Mowlavi G. Intestinal Parasites and Bruxism in Children. Iran J Public Health. 2013;42(10):11-99.
24. Díaz-Serrano KV, da Silva CB, de Albuquerque S, Pereira Saraiva Mda C, Nelson-Filho P. Is there an association between bruxism and intestinal parasitic infestation in children? Journal of dentistry for children (Chicago, Ill). 2008;75(3):276-9.
25. Tehrani MH, Pestechian N, Yousefi H, Sekhavati H, Attarzadeh H. The Correlation between Intestinal Parasitic Infections and Bruxism among 3-6 Year-Old Children in Isfahan. Dental research journal. 2010;7(2):51-5.
26. Melo G, Duarte J, Pauletto P, Porporatti AL, Stuginski-Barbosa J, Winocur E, et al. Bruxism: An umbrella review of systematic reviews. Journal of oral rehabilitation. 2019;46(7):666-90.
27. Restrepo C, Manfredini D, Lobbezoo F. Sleep behaviors in children with different frequencies of parental-reported sleep bruxism. Journal of dentistry. 2017;66:83-90.
28. Huynh NT, Desplats E, Bellerive A. Sleep bruxism in children: sleep studies correlate poorly with parental reports. Sleep medicine. 2016;19:63-8.