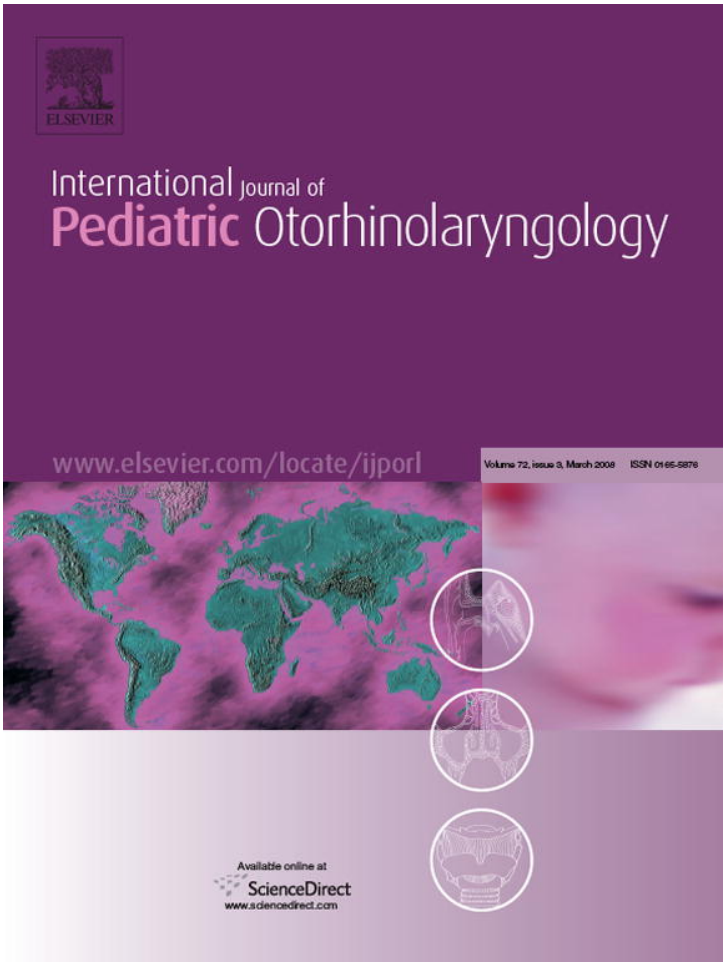

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Bruxism in children with nasal obstruction

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Summary

Introduction: Bruxism is characterized by repeated tooth grinding or clenching. The condition can occur in all age ranges and in both genders, being related or not to other oral habits.
Objective: The objective of the present study was to investigate the occurrence of bruxism in children with nasal obstruction and to determine its association with other factors.
Methods: Sixty children with nasal obstruction seen at the Otorhinolaryngology Outpatient Clinic of the University Hospital of Ribeirão Preto participated in the study. The data were obtained using a pre-established questionnaire applied to the person responsible and by orofacial evaluation of the patient. The participants were divided into two groups: group with bruxism (GB) as reported by the relatives and with the presence of tooth wear detected by clinical evaluation, and group without bruxism (GWB), consisting of children with none of the two symptoms of bruxism mentioned above.
Results: The presence of bruxism exceeded its absence in the sample studied (65.22%). There was no significant difference ($P < 0.05$) between groups regarding gender, phase of dentition, presence of hearing diseases, degree of malocclusion, or child behavior.
Conclusion: Bruxism and deleterious oral habits such as biting behavior (objects, lips and nails) were significantly present, together with the absence of suction habits, in the children with nasal obstruction.

1. Introduction

Bruxism is a non-functional activity characterized by repeated tooth clenching or grinding which may

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occur during the day or more commonly at night in an unconscious manner [1,2]. Bruxism is classified as centric when tooth clenching occurs in centric occlusion or in maximum intercuspation without sliding, and as eccentric when there is tooth sliding in protrusive and lateroprotrusive positions, causing facet wear usually in anterior and posterior teeth [3]. The etiology of bruxism is considered to be multifactorial, including local [1,4], psychological [1,5—8], and neurological factors [1].

Bruxism may be caused by allergic processes, by asthma and by respiratory airway infection. Thus, bruxism may be a reflex of the central nervous system due to an increase in negative pressure in the middle and/or inner ear caused by allergic edema of the mucosa of the auditory tubes. The disorder of the middle ear would induce a reflex action in the temporomandibular joint (TMJ), stimulating the nucleus of the trigeminus nerve [2]. Other investigators have mentioned the association between bruxism and respiratory problems [5,9—14]. Parafunctional habits have also been detected in children with bruxism, among them suction of a pacifier, nail biting and the habit of biting objects [2,10].

The incidence of bruxism reported in the literature ranges from 5 to 81% of different age ranges, a fact attributed to different methods of investigation [1,6,8,15—18]. A previous study pointed out that subjective symptoms and clinical signs of TMJ disorders, including bruxism, were more common among boys than girls in the 6—8 year age range [19].

An early diagnosis should be made to avoid damage such as dental mobility, headache and traumas. Some authors believe that childhood bruxism does not always need to be treated since the child is in the growing process and is resistant to bruxism [1]. However, if damage to the stomatognathic system is present, occlusal adjustment and orthodontic braces [15], an interdental splint [20], psychotherapy [15,20—22], and exercise [15] are prescribed. Additional therapeutic modalities have been suggested, but there is no consensus about the most efficient one [23].

The objective of the present study was to investigate the occurrence of bruxism in children with nasal obstruction and to determine its association with other factors.

2. Methods

The study was approved by the Research Ethics Committee of the University Hospital, Faculty of Medicine of Ribeirão Preto, University of São Paulo (no. 1959/02) and the persons responsible for the children signed a term of informed consent for their participation in the study.

The study was initially conducted on 60 children of both genders aged 2—13 years with an otorhinolaryngologic diagnosis of nasal obstruction. The children were followed at the Otorhinolaryngology Outpatient Clinic of the University Hospital, Faculty of Medicine of Ribeirão Preto (HCFMRP—USP) from February to June 2002.

2.1. Inclusion criteria

Children who presented nasal obstruction determined by an otorhinolaryngologist were selected. A questionnaire was applied to the persons responsible for the children regarding breathing behavior and the patients were submitted to otorhinolaryngologic physical examination including otoscopy, rhinoscopy and oroscopy. For a more precise diagnosis of the causal factor of respiratory obstruction, the children were also submitted to flexible nasofibroscopy.

2.2. Exclusion criteria

Children with congenital or acquired craniofacial abnormalities, genetic syndromes, neurologic disorders, mental deficiency, and psychiatric disorders of childhood were excluded from the study.

After subject selection, the persons responsible answered a pre-established questionnaire and the children were submitted to orofacial evaluation. The objective of the questionnaire was to obtain data regarding identification, gender, age, report of bruxism, period of occurrence and frequency of bruxism, presence of pain in the masticatory muscles and/or TMJs, presence of deleterious oral habits such as biting of lips, cheeks, objects and nails, and suction (fingers, pacifier), and characterization of child behavior. Orofacial evaluation was performed by the same professional, who recorded type of dentition, degree of malocclusion and presence of tooth wear. The degree of malocclusion was classified according to the classification of the World Health Organization (WHO), the standard adopted by Shinkai et al. [9], i.e., absent/mild (no abnormality, or mild anomalies such as one or more teeth with giroversion or with slight overlap or spacing), moderate-severe (anterior crossbite, open bite, posterior crossbite, marked overbite, and marked jutting of teeth). The presence of tooth wear was determined by the observation of facets for atypical wear that might characterize bruxism.

The subjects were then divided into two groups, i.e., with bruxism (GB) and without bruxism (GWB). Two criteria were used for inclusion in GB: the child

should present tooth wear and the person responsible should report during the interview that the child ground his teeth. Thirty children (65.22% of the sample) were included in this group.

Children without tooth wear and children whose parent/person responsible denied episodes of bruxism were included in GWB. Sixteen of the 60 children studied (34.78%) met the criteria for this group. The remaining children who did not meet the two criteria for inclusion in GB or GWB ($N = 14$) were excluded from the study.

Data were analyzed statistically using the GMC Basic Software, version 7.3. For intergroup comparison, the chi-square test was used for the variable presence/absence of oral habits, and the Fisher exact test was used for comparison of the following variables: gender, phase of dentition, degree of malocclusion, presence and absence of hearing diseases, children's behavior as reported by the relatives, pain in the masticatory muscles and/or TMJs, respiratory diseases, and deleterious oral habits. The binomial test was used for intragroup comparison to determine differences in gender and presence of allergic rhinitis and deleterious biting or suction habits in the sample as a whole.

3. Results

Analysis by the binomial test revealed that the presence of bruxism was significantly higher than its absence ($P < 0.05$) in the study sample, i.e., more children met the criteria of GB (30 subjects) than of GWB (16 subjects).

GB consisted of 21 boys (70%) and 9 girls (30%) aged 2 years and 1 month to 10 years and 9 months. GWB consisted of 8 boys (50%) and 8 girls (50%) aged 2 years and 9 months to 12 years and 8 months.

Comparison of GB and GWB indicated a lack of significant differences ($P > 0.05$) between them regarding the following aspects: gender, age range, dentition phase (Table 1), degree of malocclusion, pain in the masticatory muscles and/or TMJs (Table 2), child behavior as reported by the relatives, presence and absence of hearing diseases, and at least one deleterious oral habit (suction habits).

There was a statistically significant difference ($P < 0.05$) between GB and GWB regarding the presence/absence of oral habits related to biting such as nail, object and lip biting, with a prevalence of biting habits in GB.

The intragroup analyses carried out using the binomial test revealed a prevalence of boys in GB ($P < 0.05$) and of allergic rhinitis associated with other airway diseases present in 22 children, i.e., 73.3% of the cases ($P < 0.01$), as can be seen in Table 3. The presence of two or more deleterious habits related to biting ($P < 0.01$) and the absence of suction habits ($P < 0.05$) were also observed. The same did not apply to GWB.

4. Discussion

The diagnosis of bruxism may be incomplete if only the presence of tooth wear is considered. Tooth wear may indicate a history of previous, and not current, bruxism, or the habit may be recent with a duration insufficient to cause tooth wear [9]. Thus, the methodology employed in the present study was based on two criteria for the definition of the occurrence of bruxism, i.e., clinical observation of tooth

Table 1 Distribution of the groups with bruxism (GB) and without bruxism (GWB) regarding gender, age range, and type of dentition

	Gender				Age range (m)	Phase of dentition			
	F	*f* (%)	M	*f* (%)		Primary	*f* (%)	Mixed	*f* (%)
GB ($n = 30$)	9	30	21	70	2—1 to 10—9	13	43.33	17	56.67
GWB ($n = 16$)	8	50	8	50	2—9 to 12—8	9	56.25	7	43.75

F: Female; M: male; *f* (%): relative frequency; m: months.

Table 2 Description of pain in the masticatory muscles and/or temporomandibular joints by the groups with bruxism (GB) and without bruxism (GWB)

	Degree of malocclusion				Pain			
	A/L	*f* (%)	M/S	*f* (%)	P	*f* (%)	A	*f* (%)
GB ($n = 30$)	17	56.67	13	43.33	3	10	27	90
GWB ($n = 16$)	7	43.75	9	56.25	0	0	16	100

A/L: absent/low; *f* (%): relative frequency; M/S: moderate/severe. P: presence; A: absence.

Table 3 General overview of upper airway diseases in the group with bruxism (GB) and the group without bruxism (GWB)

GB	HVA	HAVA	RA	Chronic sinusitis	GWB	HVA	HAVA	RA	Chronic sinusitis	Bronchitis	Septal deviation
1	X		X		1	X				X	
2	X		X		2		X				
3	X		X		3	X					
4			X		4		X				
5	X		X		5		X				
6		X	X		6	X		X			
7	X		X		7	X		X			
8		X			8		X				
9	X		X		9			X			
10			X		10		X				
11		X	X		11	X		X			
12	X		X		12		X	X	X		
13		X			13		X				
14		X			14	X		X			X
15	X		X		15		X	X			
16	X		X		16	X		X			
17	X		X								
18	X			X							
19	X		X								
20		X	X								
21	X										
22		X									
23		X									
24	X		X								
25		X	X								
26	X		X								
27	X										
28		X	X								
29		X	X								
30		X	X								

HVA: Adenoid hypertrophy; HAVA: adenotonsillar hypertrophy; RA: allergic rhinitis.

wear and a report of tooth clenching and grinding by the persons responsible for the children.

In the present sample, consisting of children with airway diseases, there was a significant predominance of bruxism, in agreement with authors who point out an association between airway diseases and bruxism [9,10—14].

Intragroup analysis revealed a prevalence of allergic rhinitis associated with other airway diseases in the group with bruxism, confirming the fact that allergic children are more predisposed to bruxism than non-allergic children [1]. The association of bruxism with respiratory diseases has also been reported by Marks [2]. In addition to the presence of allergic edema in the mucosa of the auditory tubes, the author suggested that allergic children have a larger amount of saliva, which reduces the need to swallow. This may alter the pressure in the auditory tubes and increase the occurrence of bruxism. However, no reports investigating this hypothesis were detected.

In the present sample there was no association between bruxism and the presence of hearing diseases, confirming the findings reported by Porto et al. [10].

There was no difference in gender between groups, in agreement with other studies [9,24]. However, intragroup analysis revealed a predominance of male gender in GB in agreement with other studies [19,25].

The age range of the group with bruxism was 2 years and 1 month to 10 years and 9 months, indicating that bruxism can be present among children of different ages [19,25]. In the present study there was no difference between groups or even by intragroup analysis regarding dentition phase. This result agrees with Porto et al. [10], but not with authors who detected a relationship between bruxism and decidual dentition [13] or mixed dentition [4].

According to WHO criteria, in the present study there was no association between bruxism and the

degree of dental malocclusion, in agreement with previously reported data [7,9,24,26]. Conversely, several authors consider occlusal abnormalities to be among the important local factors for the onset of bruxism [1,4].

There was no difference between groups regarding the presence or absence of pain in the masticatory muscles and/or TMJs. In addition, absence prevailed in the intragroup analysis, as also reported by others [6]. Episodes of bruxism are more occasional and milder in children, explaining the absence of TMJ dysfunction [1]. This symptom may possibly manifest more frequently after childhood if there is persistence of bruxism, which is an aggressive factor against the stomatognathic system.

In the present study there was no difference between GB and GWB regarding the behavior of the children reported by the persons responsible. Several authors have pointed out an intimate relationship between bruxism and psychogenic factors [1,3,6,7]. A relationship between bruxism and anxious behavior has been detected [5,8]. The report of the parents about the behavior of the children probably was not sufficient to identify problems of behavior, or it is possible to assume that there are different etiologies for this parafunctional behavior.

Regarding the occurrence of other oral habits, a statistically significant difference was observed between GB and GWB. A significant presence of habits involving biting behavior and the absence of suction habits were detected in GB according to intragroup analysis.

According to Ramfjord and Major [3], bruxism may be intimately associated with oral habits of forced biting, such as biting of objects, tongue, cheeks and nails. Some authors associate bruxism with habits involving object biting, tongue suction and oral breathing [2], and sleeping with a hand below the chin [10], or include in the same category of bruxism repetitive grinding and clenching movements and biting objects, nails, lips and cheeks, as well as suction habits [1].

Future studies on nose-breathing and mouth-breathing children without allergic rhinitis may better elucidate the role of allergic rhinitis as a factor causing bruxism.

5. Conclusion

In the sample studied here, consisting of children with airway diseases, there was a prevalence of bruxism, a significant presence of deleterious oral habits such as biting (objects, lips and mails) and the absence of suction habits.

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