Rédua RB, et al., J Neonatol Clin Pediatr 2021, 8: 086
DOI: 10.24966/NCP-878X/100086

HSOA Journal of Neonatology and Clinical Pediatrics

Research Article

Prevalence of Sleep Bruxism in Brazilian children and association with type of delivery, breastfeeding period and oral habits with follow-up in 3 decades

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Abstract

Purpose: to verify the prevalence of Sleep Bruxism (SB) in children in the last 3 decades and to verify the possible association of this condition with type of delivery, breastfeeding period, oral habits and gender.

Materials and methods: A 30-year cohort composed of the dental records of 600 children who were 12-23 months old at their first dental appointment and who were followed up to 12 years of age (200 followed since 1981, Group 1; 200 followed since 1991, Group 2; and 200 followed since 2001, Group 3) was analytically and quantitatively evaluated. Random sample calculation was performed with 95% confidence, a maximum error of 2.95% and a ratio of 50%.

Results: The prevalence of SB in children was 13%, 16.5% and 20.5% in the 80s, 90s and 2000s respectively. There was no association between SB and type of delivery, breastfeeding period longer than 1 year, oral habits and gender.

Conclusion: The prevalence of sleep bruxism in children has increased in the last three decades. Type of delivery, breastfeeding period, oral habits and gender has no association with the occurrence of SB.

Keywords: Breastfeeding; Childhood sleep bruxism; Delivery; Finger sucking; Obstetric; Sleep bruxism

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Citation: Rédua RB, Rédua PCB, Lira AO (2021) Prevalence of Sleep Bruxism in Brazilian children and association with type of delivery, breastfeeding period and oral habits with follow-up in 3 decades. J Neonatol Clin Pediatr 8: 086.

Received: August 19, 2021; **Accepted:** August 31, 2021; **Published:** September 07, 2021

Introduction

Bruxism has two different circadian manifestations. Awake Bruxism (AB) is a daytime parafunctional habit, while Sleep Bruxism (SB) is considered a sleep behavior [1], that can affect oral health, depending on its severity [2]. The SB is a masticatory muscle activity during sleep that is characterized as rhythmic (phasic) or non-rhythmic (tonic), and it is not considered a movement disorder or a sleep disorder in otherwise healthy individuals [3], but a sign of a health condition in some individuals (e.g. obstructive sleep apnea, sleep disorders, gastro-esophageal reflux) [2,4-6].

Regarding the consequences of SB, they include tooth surface wear, recurrent restorative fractures and even pulp exposure [1,7], masticatory muscles pain or fatigue and temporomandibular disorders [8], parent apprehension about teeth creak in by child during sleep, implications in oral health-related quality of life related to causal factors [9] like obstructive sleep apnea, sleep disorders, snoring and gastro-esophageal reflux [2,4-6,9].

The prevalence of SB in children is very variable, ranging from 3.5 to 46% [10,11]. This variance may be attributed to fact that the diagnosis of SB in children is still challenging, once it is predominantly accessed through parental report [12]. Although polysomnography is the current reference standard for diagnosing SB, it has some disadvantages, such as high cost and technical difficulties when used in children [13]. Other validated methods such as physical examination and/or questionnaires are often used [14]. However, it is important to consider that signs of tooth wear can be related to past episodes of bruxism, as if they were scar not necessarily indicating its occurrence in the present time.

The SB has no gender prediction [10], but psychosocial factors, in particular anxiety and stress, were often associated with in children [15]. Common events in a child's life, such as the birth of a sibling, introduction to school life and school change, for example, can lead to anxiety or fear and, as a result, trigger episodes of SB [16]. Children who have a night sleep period smaller than 8 hours are more likely to develop SB, as well as chronic rhinitis, asthma, amygdala hypertrophy, adenoid hypertrophy, obstructive sleep apnea, sleep disorders and snoring [2,4-6,9]. Gastroesophageal reflux is also mentioned as an etiological factor, although the physiological mechanism of this stimulus is not yet fully understood [6,17].

Although Sari and Sonmez [18] and Behr [19] demonstrate a relationship between bruxism and occlusal factors, there is greater and strong scientific evidence that this association cannot be proven [7,10,20-23]. Regarding the association between oral habits and SB, the literature presents few and divergent studies [9,10,24], but always recognizing the relationship of the child's anxiety with the SB.

We did not find until the search period (December 2019) studies verifying the association of SB with type of delivery and breastfeeding period.

This Practice-based Research aimed to verify if there was an association between SB in children and the type of delivery, breastfeeding period, oral habits and gender. Besides checking if the prevalence of SB in children has increased in the last 3 decades.

Materials and methods

Before data collection, this study received approval from the local Human Research Ethics Committee. A convenience sample of 600 patients was defined to compose 3 groups of 200 children: Group 1 children who had their first dentist visit in the early 1980s, Group 2 in the early 1990s, and Group 3 in the early 2000s. Inclusion criteria were: Age between 12 and 23 months of life during the first dentist visit, first dentist visit performed in the early years of the decade and child followed until 12 years old. A total of 1,323 dental records of children were analyzed. 771 records from children whose first dental visit occurred between 12 and 23 months of age were included (271 in Group1, 258 in Group 2 and 242 in Group 3) and 552 records of children in which the first visit occurred at different ages were excluded. Exclusion criteria were: Children with neuropsychomotor alterations reported at the first anamnesis or diagnosed later were excluded, as well as incomplete or illegible records, children who abandoned follow-up before 12 years old, and children attending another pediatric dentist during the follow-up period (71 in Group 1, 58 in Group 2 and 42 in Group 3). All children were followed for 11 years by the same professional, who was a specialist and professor of pediatric dentistry, in a private practice in the city of Vitória, ES, Brazil.

The sample was verified by ratio error and the expected maximum error was 2.96%. The error was verified by calculating the sample size for proportion estimators, considering the 95% confidence level and 50% ratio, which maximizes the variability and results in the highest possible value for the sample. The correction factor for finite population was used.

Statistical analysis was done by descriptive analysis of the research data. The logistic regression test was applied to verify the association between SB e the factors investigate. The significance level was 5% with a 95% confidence interval. Statistical analyses were performed on the SPSS Statistics version IMB 21 (SPSS Inc, Chicago, USA).

In the first visit the data collected includes the type of birth of the child, breastfeeding period and presence of oral habits. Information was given about the rational use of sugar, preferably at predetermined feeding times, oral hygiene instructions and information to parents about SB expression and its consequences. During this first visit, a liability term was provided for parents ensuring that, if the child returned at every 6 months for preventive visits, in the case of carious lesions, the dental professional would perform the treatment without financial costs for the family [25].

After the first dental visit, follow-up visits were scheduled by sending letters for periodic clinical evaluations at every six months. When the child did not show up, two additional letters were sent, at seven months after the last visit and at 11 months after the last visit [25]. At each recall visit parents were asked about oral habits and about the occurrence of SB in the child. Clinically, the presence of dental wear was evaluated; however, the diagnosis of SB was made only when confirmed by parents' report about children teeth grinding at night.

Results

The mean age of children at the first office visit was 20.4, 19 and 17.1 months in Groups 1, 2 and 3respectively. There were 307 boys and 293 girls with 106 and 94, 103 and 97 and 98 and 102 boys and girls in Groups 1, 2 and 3respectively.Intervals between sessions of up to 8 months or less were observed in 41 children (20.5%) in Group 1, 78 (39%) in Group 2 and 92 (46%) in Group 3. A maximum interval between sessions of approximately 9 to 12 months was observed in 123 children (61.5%) in Group 1, 93 (46.5%) in Group 2, and 74 (37%) in Group 3. A period exceeding 12 months between sessions was observed in 36 children (18%) in Group 1, 29 (14.5%) in Group 2 and 34 (17%) in Group 3.

Of the 600 children included in the study, 100 (16.6%) were diagnosed with SB, (46 boys and 54 girls). Of the 200 children in each group, 26 children (13%) were diagnosed with SB in Group 1, 33 (16.5%) in Group 2 and 41 (20.5%) in Group 3. Of the children observed with bruxism, 30 of them were diagnosed in the first to fourth year of life, 55 from the fifth to the eighth year and 15 from the ninth to the twelfth year (Table 1).

	Children with SB	Male	Female	Diagnosed from the first to fourth year age	Diagnosed from the fifth to eighth year age	Diagnosed from the ninth to twelfth year age
Gruop 1	26	13	13	4	12	10
Gruop 2	33	17	16	9	22	2
Gruop 3	41	16	25	17	21	3
Total	100	46	54	30	55	15

Table 1: Prevalence and age of SB diagnosis in 600 children.

About the type of delivery, in Group 1 91 (45.5%) children were born by caesarean section and 108 (54%) through normal delivery, and one did not obtain information (adoption), in Group 2 113 (56). 5%) through cesarean section and 87 (48.5%) through normal delivery and in Group 3 171 (85.5%) through cesarean section and 29 (14.5%) through normal delivery.

The average period of breastfeeding was 6.76 months in Group 1, 7.09 months in Group 2 and 7.7 months in Group 3. Of the total sample, 18 children were not breastfed, 100 received breastfeeding from 1 to 3 months, 197 from 4 to 6 months, 219 from 7 to 12 months, 61 from 13 to 24 months and 5 children were breastfed for over 25 months.

Of the 600 children in the study, 99 had persistent oral habits (pacifier and / or finger) after 4 years of age, 29 children in Group 1, 35 in Group 2 and 35 in Group 3.

The logistic regression test with a 5% significance level showed no statistically significant association between SB occurrence and breastfeeding period longer than 1 year (Table 2). The logistic regression test demonstrated that the type of delivery was not a risk factor for the occurrence of SB (Table 3). The logistic regression test showed that the presence of oral habits has no association with the occurrence of SB (Table 4). There was no gender predisposition with the occurrence of SB (Table 5).

	p value	OR	95.0% confidence interval for OR	
			Inferior limit	Upper limit
Breastfeeding period longer than 1 year	0.312	1.022	0.980	1.066
OR. OddsRatio.				
Pseudo-R^2 = 0.004.				

Table 2: Logistic regression model to verify the association between SB occurrence and breastfeeding period.

	p value	OR	95.0% confidence interval for OR	
			Inferior limit	Upper limit
Type of delivery (Caesarean)	0.729	0.927	0.601	1.428
OR. OddsRatio.				
Pseudo-R^2 = 0.004.				

Table 3: Logistic regression model to verify the association between SB occurrence and type of delivery.

	p value	OR	95.0% confidence interval for OR	
			Inferior limit	Upper limit
Presence of oral habits	0.194	1.368	0.852	2.195
OR. Odds Ratio.				
Pseudo-R^2 = 0.005.				

Table 4: Logistic regression model to verify the association between SB occurrence and oral habits.

	p value	OR	95.0% confidence interval for OR	
			Inferior limit	Upper limit
Gender (Male)	0.239	0.776	0.509	1.184
OR. OddsRatio.				
Pseudo-R^2 = 0.005.				

Table 5: Logistic regression model to verify the association between SB occurrence and gender.

Discussion

A search of the available literature indicates that this appears to be the first 30-year historical cohort study investigating the prevalence of SB in children and investigating the association between SB and type of delivery and breastfeeding period.

In this study, we consider the diagnosis of SB only when confirmed by the parents report. The use of electromyographic for this diagnosis was not available in the 1980s; in addition to the high costs in the following decades limit its use [13]. Even considering the follow-up of the child from the first year of life to 12 years, the diagnosis was not made exclusively by signs of tooth wear, as these may be related to other causes.

We verify in this study the increase of SB in children in the last 3 decades, this factor may be related to the increase in children's life rhythm, additional out-of-school activities and even greater demand for school performance, as suggested by Serra et al [26] and Castrofloric et al [5] who also found an association of high levels of responsibility by children. Additional factor considered is the increase in pollution in large centers, with studies relating a greater number of respiratory problems in the population, such as amygdala hypertrophy and adenoid hypertrophy, especially in children.

The results not show prediction by gender, corroborating other published studies [10,27]. Although we have not found other studies relating the occurrence of SB with type of delivery and breastfeeding period, our results show the absence of this relationship. Results that were expected because the literature demonstrates that SB is related to central changes: Such as psychological factors related to fear and anxiety of the child [9,15] and as changes in oxygen saturation during the sleep caused by obstructive sleep apnea [28,29].

Our results do not show association between oral habits and SB corroborating with Soares-Silva [9,24] who demonstrates no relationship about SB and finger or pacifier sucking, while Gonçalves et al [10] related that onicofagy was related to SB in children but it is much more related to the child's anxiety component than to the local stimulus, as discussed in the previous paragraph.

Conclusion

The prevalence of sleep bruxism in children was 13%, 16.5% and 20.5% in the 80s, 90s and 2000s respectively. There was no association between SB and type of delivery, breastfeeding period, oral habits and gender.

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