Sleep Bruxism and associated factors in preschool children of Campina Grande, Northeast of Brazil


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Abstract

Background: Sleep Bruxism is classified as a movement disorder related to sleep. This parafunction is characterized by non-functional teeth contact, manifesting by grinding or chenching of teeth. The aim of this study was to investigate signs and suggestive symptoms of bruxism in preschool children.

Materials and Methods: Transversal and quantitative study with a margin of error in the data analysis 5%. This research was developed in Campina Grande, a city of Northeast Region, Brazil. A face to face interview with application form and physical examination intraoral represented the instruments used in data collection. The study population covered children aged from two to five years and their parents, enrolled in five public kindergartens.

Results: The total sample consisted of 374 children and 341 parents. The mean age was 4.1 years, 39% of the children were oronasal breathers, being 40.7% male and 59.3% female. Concerning the signs and symptoms of sleep bruxism in those schoolchildren, 54.8% of them presented tooth noise, 50.8% had teeth grinding, 46.8% complained of some tooth discomfort when waking up, 44.9% had sleep quality decrease, and 24.1% muscular fatigue when waking up. There was a significant association (p<0.01) between tooth noise, sleep quality decrease and children with oral breathing or asthma history.

Discussion and conclusion: There is a small number of studies with the objective of assessing Sleep Bruxism in children. Signs and suggestive symptoms of bruxism in preschool children had a higher prevalence. Oral breathing and asthma history were associated with signs and symptoms of Sleep Bruxism.

Keywords
Sleep Bruxism; Preschool Child; Signs and Symptoms; Mouth Breating; Asthma; Parents

Abbreviations
SB – Sleep Bruxism

Introduction
Sleep Bruxism (SB) or nocturnal bruxism represents an oral activity characterized by tooth grinding and/or clenching during sleep, with sounds production and generally associated to micro-awakening. It differs of diurnal bruxism by wrapping different statements of conscience (sleep and vigil) and of physiology or oral motor excitability [1,2].

This subject is an important public health due to potential etiologic associations and effects. Epidemiological studies with different methodologies and populations have been conducted, for this reason, the prevalence of SB is imprecise and probably underestimated. The occurrence of sleep bruxism in schoolchildren varies from 3.5% to 40.6%, depending on the age group, gender and methods used for measurement [3].

Children who sleep for less than 8h a night are more likely to have SB. Light and noise in the room were two predisposing factors [4]. There are others associated factors as sialorrhea during sleep, pacifier use, lip and fingernails biting, altered cheekèck tônus and bite, besides the participation of the perioral muscles during liquid swallowing, frequent headaches, difficulties in the alimentation [5] and functional movement.
disorders [6]. Individuals with this condition present a disturbed sleep or have difficulties to start it. An association of SB events with awakenings and a possible maintenance function of airway patency inspires a relation of SB events with airway obstruction events, but there are still questions without answers [7]. In addition, they have a rhythmic masticatory muscle activity eight times higher in relation to non-bruxers, which implies in a oromotor activity secondary of micro-excitement, with activation of Autonomous Nervous Sistem during sleep. There are more cracks for episodes with larger amplitude and shorter duration [8].

An increasing preoccupation has been occurring regarding SB’s profiles involving children because the possible implications in sleep quality and on the individual’s integral development [9]. Its diagnosis still raises questions on the part of researchers and clinicians. The parafunction habit has a direct impact on quality of life not only of the child as well as their close family members, and it is considered as important risk factor for temporomandibular disorders [10].

According to what was cited previously and by the direct relation of these terms with the performance of school children’s summed to the information gaps about this issue, it justified the development of the present study. Therefore, the aim of this study was to investigate signs and suggestive symptoms of bruxism in preschool children as well other associated factors.

Methods

Transversal and quantitative study with inductive data approach, developed in Campina Grande, Northeast Region, Brazil.

The sample size calculation and number of individuals recorded in public day care centers in Campina Grande, State of Paraiba. It was adopted 95% Confidence Interval (CI), 5% sampling error, β equal to 0.20 and prevalence estimated at 24.6%.Inclusion criteria for the sample were the following: children aged from two to five years of age (and their parents), of both genders, regularly enrolled in early childhood education and with primary teeth only.

Exclusion criteria: preschoolers under orthodontic, orthopedic (Jaw’s Functional Orthopedics), speech therapy or fisioterapy treatment, children who were taking medications or had associated epileptic activity or other medical, mental, or behavioral disorders.

The total sample was divided into three distinct groups: 1 children (oral health evaluation) and [2 their parents (Interview). Data collection occurred in 2012 and 2014 in the classroom and under artificial light. Face to face interview with application of form and intraoral examination (with the child sitting) were the instruments for gathering information. The principles of biosafety/cross infection control were respected with disposables for clinical examination.

The children’s parents were interviewed because the children were judged to be too young to answer the questions reliably. In addition, the indispensable condition required to confirm the diagnosis included a guardian’s report of nocturnal clenching and grinding sounds. During the anamnèsis conducted with the parents, they were asked to answer whether they had heard their child clenching or grinding their teeth two or more times per week [11].

To determine sleep bruxism, we applied the minimal criteria proposed by the American Academy of Sleep Medicine (AASM) [11,12]. The methodology follows this reasoning: Diagnostic Criteria – Sleep Bruxism (code-306.8) minimal criteria: A plus B.

A. The patient has a complaint of tooth-grinding or tooth-clenching during sleep
B. One or more of the following occurs

1. Abnormal wear of the teeth;
2. Sounds associated with the bruxism;

Only anterior teeth were evaluated to measure wear [13]. To standardize the dental wear patterns, the following criteria proposed by Bernal and Tsantsouris [14] were used: [1] Dental wear of the enamel only; [2] Dental wear of the enamel and dentin; [3] Dental wear of up to 1/3 of the length of the crown; and [4] Dental wear more than 1/3 of the length of the crown. Children who had grade 2 or higher were considered to possess positive diagnostic criteria.

For data analysis, techniques of descriptive and inferential statistics were used at 95% CI, 5% margin error and performed using the SPSS software (Statistical Package for the Social Sciences) version 23, Pearson’s chi-square test and Fisher’s Exact test. This study complied with universal principles in bioethics and the primary research project was approved by Ethics Committee of the State University of Paraiba, Brazil.

Results

The total sample consisted of 374 children and 341 parents. The mean age was 4.1 years for the children, being 40.6% male and 59.4% female. According to the medical history, 39% of the children were oronasal breathers, 26.2% had asthma, 22.7% allergics and 11% with sensory processing disorders. The mean age for the parents was 24.3 years, an average of 7 years of study, with mother interviewed in 80.2%.

Concerning the signs and symptoms of sleep bruxism in those schoolchildren, 54.8% of them presented tooth noise, 50.8% had teeth grinding, 46.8% complained of some tooth discomfort when waking up, 44.9% had sleep quality decrease, and 24.1% muscular fatigue when waking up (Table 1). There was a significant association (p<0.01) between tooth noise, sleep quality decrease and children with oral breathing or asthma history (Table 2).

Data did not prove significant association between children or their parents age, gender or years of education
(parents) and signs or and suggestive symptoms of bruxism in these preschool children (p>0.05).

We did not verify significant association between considered discomforts and age group (p>0.05). That same behavior still was verified considering discomforts and school gender. Based upon these data, teeth noise, sleep quality decrease and toothache when waking up had the higher percentage in female children. The opposite was observed to the teeth grinding and to the muscular fatigue, where male children had the higher percentage, but without a significant association (p>0.05).

There is also no association between the SB related by parents and the dental wear patterns (p>0.05), but male had the higher percentage of dental wear more than 1/3 of the length of the crown.

Table1. Signs and symptoms of sleep bruxism in the school children, according to gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>N %</th>
<th>N %</th>
<th>N %</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>152</td>
<td>222</td>
<td>374</td>
<td>40.6</td>
<td>59.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Tooth Noise</td>
<td>84</td>
<td>55.2</td>
<td>121</td>
<td>54.5</td>
<td>54.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Teeth Grinding</td>
<td>78</td>
<td>51.3</td>
<td>112</td>
<td>50.4</td>
<td>50.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Tooth discomfort when waking up</td>
<td>71</td>
<td>46.7</td>
<td>104</td>
<td>46.8</td>
<td>46.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Sleep quality disease</td>
<td>69</td>
<td>45.4</td>
<td>99</td>
<td>44.6</td>
<td>44.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Muscular fatigue when waking up</td>
<td>32</td>
<td>21.0</td>
<td>58</td>
<td>26.1</td>
<td>24.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

P>0.05
(1): Fisher’s Exact test
(2): Pearson’s chi-square test.

Table2. Signs and symptoms of sleep bruxism in the school children, according to medical history

<table>
<thead>
<tr>
<th>Variable</th>
<th>Oral breathing</th>
<th>Asthma</th>
<th>Total</th>
<th>N %</th>
<th>N %</th>
<th>N %</th>
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<tbody>
<tr>
<td>TOTAL</td>
<td>146</td>
<td>98</td>
<td>276</td>
<td>374</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Tooth Noise*</td>
<td>143</td>
<td>3</td>
<td>81</td>
<td>17</td>
<td>244</td>
<td>100.0</td>
</tr>
<tr>
<td>Teeth Grinding</td>
<td>43</td>
<td>103</td>
<td>41</td>
<td>17</td>
<td>244</td>
<td>100.0</td>
</tr>
<tr>
<td>Tooth discomfort when waking up</td>
<td>62</td>
<td>84</td>
<td>41</td>
<td>57</td>
<td>244</td>
<td>100.0</td>
</tr>
<tr>
<td>Sleep quality disease*</td>
<td>127</td>
<td>19</td>
<td>75</td>
<td>23</td>
<td>244</td>
<td>100.0</td>
</tr>
<tr>
<td>Muscular fatigue when waking up</td>
<td>42</td>
<td>104</td>
<td>38</td>
<td>60</td>
<td>244</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*P<0.01
(1): Fisher’s Exact test
(2): Pearson’s chi-square test.

Discussion
The children were classified in 39% as oral/oronasal breathers. A higher prevalence (55%) of oral/oral-nasal breathing schoolchildren was registered in the literature consulted, when considered children from 3 to 9 years-old [15]. They ponder as possible factors that contribute for the etiology of this condition the increase in the bad oral habits incidence, allergic problems, adenoid hypertrophy and septal deviation, besides unknown causes, associated with apnea-hypopnea problems.

According to Imbault et al. [16] there was no association between rhinitis and bruxism, but the frequency of rhinitis in children with malocclusion is higher than in the general population, which is approximately 30%. In patients with rhinitis, regardless of the presence of oral breathing, te dolico-facial growth tendency was not observed.

A little more of half of the responsible persons for the children, who received oronasal breathing’s functional diagnosis in this study, revealed hear noses with the teeth during children’s, when they were in their residences. It is important to add that most responsible persons referred to do not to sleep at home with children or do not have observed the suggestive signs of SB every night. This characteristic, according to Lavigne, Guitard e Rompré [17] interacts with crack episodes.

Other reported symptom, the sleep quality reduction, was equally narrated by McAuliffe & Padraig [18]. It is associated with snoring, nasal obstruction and to nocturnal awake by feeling of suffocation and for migraine profile and diurnal sleepiness.

The elevated frequency of teeth grinding verified in this study agrees with comments about the inclusion of this habit among SB’s main symptoms. It still included dental wasted, local pain, hypertrophy of the masseter and temporal muscles, headache, temporomandibular joint dysfunction (TMD), sleep interruption and diurnal sleepiness. In the same way coincide with the absence of significant differences for this characteristic between masculine and feminine genders [19]; aspect found in all variables investigated in this study. These authors also concluded that transverse plane of occlusion was not associated with the habit of bruxism.

Even aware of the methodological limitations of the present study there was an elevated prevalence of possible signs and symptoms of SB in preschoolers. It can lead to several implications in life quality of this population-target. This way they suggest new studies on the theme contemplating a larger sample, where cultural and socio-demographic factors can be more explored and variables with viable interferences in such conditions. They have to receive a more rigorous control and it is necessary to grow the interest of parents’ interest or responsible in take part in the discussions on a so important theme.

Conclusion
Signs and suggestive symptoms of bruxism in preschool children had a higher prevalence. Oral breathing and asthma history were associated with signs and symptoms of Sleep Bruxism.

References


