Prevalance and Associated Factors of Bruxism in Children in Chennai-A Pilot Study

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ABSTRACT

Introduction and Aim: Bruxism, the habitual grinding, gnashing or clenching of teeth at times other than during mastication of food. Bruxism usually causes tooth wear that precipitates wear facets that can range from mild to severe and can be localized or found throughout the dentition. To evaluate the dental wear in school going children and correlate the associated factors causing bruxism.

Materials and Methods: The study comprises of 255 school going children in the age groups of 7-15yrs who reside at Velapanchavdi, Tamil Nadu and also includes their respective parents.

Results: In a total of 255 children, 48 (18%) children exhibited bruxism based on parental observation. Out of 58 children with a positive or possible habit of bruxism, Sleep bruxism was reported in 26 children. Out of 48 children who exhibited bruxism, 6 children had relatives exhibiting the same habit. Based on Johansson criteria of dental wear, moderate bruxism was seen in 24 (9.4%) children. Out of 26 children who brux at night, wear facets indicating moderate bruxism is seen in 23 (88.5%) children. This could be attributed to agents like stress and anxiety.

Conclusion: The evaluated data suggest the prevalence of bruxism being 18% with the dental wear supporting the signs of moderate bruxism in 9.4% of the children. There lies an association between the positive responses and the wear facets indicating parental awareness of this habit. The need for recognizing this habit in children is very much important due to the etiologic agents, most common being stress, anxiety.

Key Words: Bruxism, Children, Teeth wear, Stress, Temporomandibular disorders.

INTRODUCTION

Bruxism, the habitual grinding, gnashing or clenching of teeth at times other than during mastication of food, was originally described by Marie and Pietkiewicz in1907 (1). In 1931, Frohman first coined the term bruxism (2). In the 1960s, a periodontist named Sigurd Peder Ramfjord championed the theory that occlusal factors were responsible for bruxism (3). Bruxism can occur during the day or night (4). Generally, individuals clench their teeth throughout the day and gnash and clench them during sleep (5). Bruxism usually causes tooth wear that precipitates wear facets that can range from mild to severe and can be localized or found throughout the dentition (6). This condition is very common in children (7). The consequences of bruxism in children are the fracture of teeth, increased teeth sensitivity, erosion of dental enamel, hypermobility of the teeth, periodontal ligament injury, fractured cusps, or pulp necrosis (7). Teeth grinding is an activity of significance to the dentist because of breakage of dental restorations, damage to the teeth, induction of temporal headache and temporomandibular disorders (8). Sleep bruxism is a non-functional behavior characterized by the grinding or clenching of teeth; it occurs during non-rapid eye movement sleep stages N1 and N2 and is associated with arousals from sleep (9). Sleep bruxism in children is most often identified by a family member, parents who observe the stereotypic tooth grinding sound, or by a dentist who recognizes abnormal occlusal wear (10).This parental recognition of bruxism habit may or may not show clinical signs of dental wear. The etiology of sleep-bruxism is considered multifactorial (11-13) consisting primarily of pathophysiologic factors like arousal response during sleep and immature masticatory neuromuscular system, psychologic factors like stress and personality and possibly morphologic factors like the anatomy of the orofacial skeleton and occlusal align-

ment(14). In this present study, a community-based prevalence rate of bruxism is assessed using parental observation of the child and clinical evidence supporting the same. Also, a brief description of the correlating factors of bruxism is discussed.

MATERIALS AND METHODS

The study comprises of 255 school going children in the age group of 7-17yrs and their respective parents. The study is concerning the participants who all reside in the same locality, velapanchavdi, Tamil Nadu. Ethical approval was obtained from the saveetha university, Chennai (SRB/STUG15/70). The survey consisted of a parental questionnaire that was distributed to the parents of the 255 children in their respective residential locations and alongside, the intra oral examination was done. The parental questionnaire consisted of questions regarding their observation of bruxism in their ward and the time of occurrence. Also, questions regarding the occurrence of the same habit in other members belonging to the same family as that of the child were questioned. The evaluation was done by identifying the presence of any wear facets on the teeth based on Johansson's criteria (15). According to which, the sum of the wear facets in the teeth was calculated to give the composite score. A range of 6 or more indicated moderate bruxism whereas a score of less than 6 accounted for no significance. It was identified using a mouth mirror under daylight. The values for the wear facets were recorded, and the overall score (15) was generated for each child. Evaluation of tooth hypermobility and TMJ disorders were also done clinically. The whole survey took place in the respective residential homes of the participants and prior informed written consent was obtained from the parents. Statistical analysis was applied to the set of questions in the questionnaire, comparing them against each other. Table 2 depicts the parental response of bruxism in their child and dental evaluation of wear facets. Table 3 depicts the relation between the children exhibiting bruxism and the same habit among any other family members. Table 4 depicts the relation between the time of bruxism in children with the positive parental response and the dental wear evaluation.

RESULTS

The overall frequency of all the questionnaire responses and clinical examination are shown in table 1.

Table 1: Frequency for Questions under Parental Questionnairre

QUESTIONS	RESPONSES	NUMBER OF PARENTS WHO RESPONDED	PERCENTAGE (%)
1. Does your child currently grind his/her teeth? Other than when eating?	Yes	48	18.8
	No	197	77.3
	May be	10	3.9
2. In the past have you ever noticed your child grinding his/her teeth?	Yes	48	18.8
	No	174	68.2
	May be	10	3.9
	NA	23	9.0
3. If your child currently grinds his/her teeth, when does grinding occur?	Day	19	7.5
	Night	26	10.2
	Both day & night	13	5.1
	NA	197	77.3
4. Does any member of the child's immediate family grind his/her teeth?	Yes	40	15.7
	No	125	49.0
	May be	88	34.5
	NA	2	.8
5. If yes, when does this family member grind his/her teeth?	Day	4	1.6
	Night	85	33.3
	Both day & night	1	.4
	NA	165	64.7

6. What is this person's relationship to this child?	Close relatives	38	14.9
	Distant relatives	50	19.6
	NA	166	65.1
7. Dental wear evaluation(johannsons criteria)	No Sig.	231	90.6
	Moderate bruxism	24	9.4
8. Tooth hypermobility	No	255	100.0
9. Tooth fractures secondary to bruxism	No	255	100.0
10. Pulpal involvement	No	255	100.0
11. Morning fatigue or pain of masticatory muscles	Yes	33	12.9
	No	222	87.1
12. Pain to palpation to masseter/ temporal muscles	Yes	14	5.5
	No	241	94.5
13. Masseter hypertrophy	No	255	100.0
14. Parent reports click when opening TMJ or are positive at examination.	No	255	100.0

Parental observation of bruxism

Questionnaire responses were obtained for 255(100%) children. Of these, parental response

Indicated that 48 (18%) had a positive history of the habit, 10(3.9%) had a possible history and 174(68%) did not present with any history of bruxism. Of the 58 children with either a positive or a possible history of the habit, 26(10.2%) children exhibited sleep bruxism, 19 (7.5%) children, awakeness bruxism and 13 (5.9%) children who presented with the habit occurring both day and night.

Bruxism among Relatives

A total of 128 (16.5%) responses indicated that members of the child's family exhibit bruxism and a further 125 (49%) responses indicated no such reports of bruxism among the relatives. In a total of 48 children who were bruxers, had relatives, 6 (12.5%) of them who were positive for the same condition and 25 (52.1%) who weren't positive for bruxism.

Clinical Detection of Bruxism

On clinical examination, out of 255 children, wear facets in the teeth were observed and evaluated based on Johansson criteria (15). The results reveal 24 (9.4%) children showing signs of moderate bruxism based on evaluating the dental wear. Out of 48 children who exhibited bruxism based on the positive parental response, wear facets indicating moderate bruxism were seen in 24(50%) children and 24 children exhibited no such significant signs of wear facets. Out of 26 children who brux at night, wear facets indicating moderate bruxism is seen in 23 (88.5%) children. This provides a statistical inference that the positive parental response of bruxism in their children, being complimentary to the wear facets seen most often, secondary to the habit is of significance. On the other hand, there is no such significance in dental wear in children who brux during the daytime. Out of 13 children who brux both day and night wear facets correlating bruxism is seen in only 1 (7.7%) of the total cases. According to table 2, out of 58 children who show bruxism, wear facets secondary to

Moderate bruxism is seen in 24 children. Also out of 26 children exhibiting sleep bruxism, wear facets indicating moderate bruxism are seen in 23 children.

Table 2: Correlation between Parental Observation of Bruxism and Clinical Diagnosis of Wear Facets

Parental observation of bruxism among children examined(no.)	Clinical diagnosis of wear facets	
	Wear facets showing moderate bruxism	Wear facets of no significance
Positive history (48)	24 (50%)	24 (50%)
Negative history (197)	0 (0%)	197 (100%)
Possible history (10)	0 (0%)	10 (100%)
Total (255)	24 (9.4%)	231 (90.6%)

Table 3: Correlation between Parental Response of Bruxism Habit in Children and any other Member of the Same Family

Parental observation of bruxism among children examined (no.)	Parental observation of bruxism in any member of the same family %		
	Positive response	Negative response	Possible response
Positive history (48)	6 (12.5%)	25 (52.1%)	17 (35.4%)
Negative history (172)	33 (19.2%)	90 (52.3%)	49 (28.5%)
Possible history (10)	0 (0%)	10 (100%)	0 (0%)
Total (230)	39 (17%)	125 (54.3%)	66 (28.7%)

Table 4: Correlation between Time of Bruxism with Dental Wear Evaluation

Parental observation of time of bruxism among children examined(no.)	Clinical diagnosis of wear facets%	
	Wear facets showing moderate bruxism	Wear facets of no significance
Bruxism during daytime (19)	0	19 (100%)
Bruxism during night time (26)	23(88.5%)	3 (11.5%)
Bruxism during both day and night (13)	1(7.7%)	12 (92.3%)
Total (58)	24 (41.4%)	34 (58.6%)

DISCUSSION

Bruxism, the habitual grinding, gnashing or clenching of teeth at times other than for the mastication of food, was originally described by Marie and Pietkiewicz in 1907 (1). Since then, the condition has been variously attributed to dental, systemic or psychological factors. Wear facets are most commonly seen secondary or as a result of this habit. The onset of bruxism in children can occur after the first year of life, with the eruption of the deciduous incisors. A study among five- and six-year-old children attending kindergarten in the geographic and socio-economic area of Minneapolis, Minnesota has shown a prevalence of bruxism of 15 % (16). The figure of 15% was close to that of 14.4% reported in 1966 by Reding, Rubright and Zimmermazn4 in a study of 1157 three- to seven-year-old children attending the University of Chicago Laboratory Schools. Studies on older persons by the same authors have indicated the decrease of the habit of bruxism with age; a prevalence of 5.1% was reported among a population of 2290, 16- to 36-year-old undergraduate and graduate students from the University of Chicago (17). In our present community based study among the residents of Velapanchavadi, Chennai, the prevalence rate of 18% as reported by the parents of the children between 7-15yrs. Prevalence of sleep-bruxism is highest during childhood, decreases across the life span and can resolve spontaneously (18). A community based study stated that the prevalence of parent-reported sleep-bruxism that occurred at least once a week among preschool and first grade children and was 36.8% and 49.6%, respectively (19). In the present study, out of children whose parents presented a positive or a possible history of bruxism, sleep bruxism was prevalent in 10.2% of those children. Clinical assessment of wear facets as a result of bruxism were also reported with an incidence of 9.4% in relation to those presenting with this habit. This clinical evaluation presented as a limitation due to the different exfoliative stages in our patients. Few studies remarked a hereditary association of bruxism. A study on identical twins showed that there was a greater chance of the presence of grinding teeth compared to individuals heterozygous; a child with bruxer parent has a Chance of bruxism 1.8 increased to submit this dysfunction (20).Whereas in our study, the statistical significance of this comparison shows no such familial predisposition of bruxism in children. In another study (16) 24.6% of the children presented with positive history of the habit.15.4% of the total sample showed clinical evidence of wear facets but did not have a history of the habit at home. Since the majority of bruxing children exhibited the habit during the night, the timing may have contributed in part to the lack of parental awareness. Although bruxism is frequently audible, a sleeping parent could be unaware of the child's habit (16). However,

in our present study there is an equal statistical significance in the association between the parental observation of the habit and presence of wear facets as a sign of bruxism. Statistical significance was seen equally in children who had positive response and showed wear facets on examination and those who did not show any significant wear facets. The reason for this may be the awareness of the parent in this community based study. This can vary depending upon the culture, the parental upbringing of the child and other associated factors. Renner et al (21) conducted a sound and informative investigation onto the relationship between bruxism and mental health in children. They demonstrated that bruxism is associated with emotional difficulties and socio-economic status. Sleep bruxism may serve as a behavioural indicator and may be a signal of early health care intervention need. A recent report indicated that children who brux are 2.4 more likely to experience migraines than children who do not brux (22). Another study (23) was aimed to determine the prevalence of childhood bruxism and associated correlates in children that were a cross-sectional survey of parents that was conducted at 4 private paediatric dental offices in Boston. In which, 5% of parents reported that their children had at least one TMD symptom; no TMD symptoms were associated with reported bruxism (23). No significant signs of severe bruxism were observed in our current study and thereby no significance is seen regarding TMD symptoms. This may be attributed to the developing TMJ in the age group of children included in our study.

CONCLUSION

A prevalence rate of 18% was reported in the present study. The dental wear with the positive parental history of bruxism exhibited that the habit of bruxism was recognized by the parents. This showed that the parents were quite aware and recognized this habit in their children. No significant familial predisposition was seen concerning bruxism in our study. Sleep bruxism is the most common type of bruxism and is of major concern due to its psychological etiology in bruxism. Therefore, an early recognition and a cognitive approach in treating bruxism in children required in addition to dental therapy.

Limitation

Certain factors served as a limitation of our studies such as the smaller sample size and the limited area that was chosen.

Recommendations

The relationships between the habit of bruxism and the associated factors are complex, further longitudinal studies over a longer period are required regarding the same.

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