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Habitual Snoring and Sleep Bruxism in a Paediatric Outpatient Population in Hong Kong

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ABSTRACT

Objective: To determine the prevalence of habitual snoring and sleep bruxism in children attending the out-patient clinics of a paediatric department.

Methodology: A cross-sectional survey of parents was conducted with questionnaire administered by paediatric nurses. Parents were recruited when they brought their children to the out-patient clinics. Sex and age were recorded. Presence and absence of habitual snoring and sleep bruxism were noted. Types of diseases that brought the children to the out-patient clinics were also noted.

Results: Twenty-nine of the 200 recruited children were noted to have habitual snoring (14.5%, 95% C.I. 10%-20%). The mean age of these habitual snorers was 6.2 +/- 3.1 years. For habitual snorers, male to female ratio was 1.4 to 1. Sixteen of these 28 children accepted a sleep polysomnographic examination. Eleven children were found to have snoring during the night of study. Two were found to have obstructive sleep apnoea syndrome. Sleep bruxism was found in 17 children (8.5%, 95% C.I. 5%-13%). Sleep bruxism was closely related to habitual snoring as 16 out of the 17 children with sleep bruxism were also habitual snorers (p<0.0001).

Conclusion: Habitual snoring and sleep bruxism were commonly found in children attending paediatric clinics. Paediatricians should be aware of these problems and be prepared to deal with them. Habitual snoring and sleep bruxism were closely related. Further studies into this relationship is needed.

Keywords: Snoring, bruxism, sleep, children

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INTRODUCTION

Snoring is an inspiratory sound produced by vibration of the oropharynx during sleep[1]. Habitual snoring, which is defined as snoring at least once every other night[1], was found in 3 to 12% of the paediatric population[2-7]. Snoring is the commonest presenting symptom of obstructive sleep apnoea syndrome (OSAS)[8]. However, only 20% of habitual snorers have OSAS[9]. The prevalence of OSAS in children was estimated to be 2%[4]. Most children with habitual snoring have primary snoring (PS), which is characterised by snoring without hypoxemia, hypercapnia, sleep disruption or daytime symptoms[10,11]. It is important to differentiate PS, a relatively benign condition, from OSAS, a condition which can lead to failure to thrive, cor pulmonale, developmental delay, hypertension or even death[8]. Sleep polysomnography (PSG) is the recommended tool used to differentiate benign primary snoring from pathologic snoring[12,13].

All published epidemiological studies about childhood snoring were conducted in the general population. There is absence of data concerning prevalence of habitual snoring in children attending paediatric out-patient clinics. The paediatric out-patient population might have a higher prevalence as it was reported that allergic rhinits and asthma were risk factors for OSAS[14-16]. The current study was designed to determine the prevalence of habitual snoring and OSAS in children attending the outpatient clinics of Kwong Wah Hospital. The outpatient clinics were receiving referrals from both within and without the hospital. These clinics did not inlcude general paediatric surgical and ear-nose and throat patients. Kwong Wah Hospital is a public funded general hospital located in an urban area of Hong Kong, a city of six million located in southern China. The population of children was around 90,000 in the area served by this hospital and 5,000 children were attending the out-patient clinics of this department at the time of this survey.

METHODS

In April 1998, 200 consecutive patients who attended the outpatient department of Kwong Wah Hospital were interviewed by designated nurses. This represented 18.6% of all out-patient attendance, 1,077, in April, 1998. There was no refusal. Parents were asked three questions: (1) presence of habitual snoring, defined as more than or equal to every other night; (2) presence of cessation of breathing despite chest or abdominal movement

during sleep; and (3) presence of tooth-grinding or sleep bruxism. The answers were noted as "yes" or "no" or "do not know". All patients were classified into three groups depending on their primary diagnoses, i.e. respiratory disorders, neurological disorders or others. All diagnoses were retrieved from the out-patients records and these diagnoses were made by specialist medical staff or trainee medical staff under supervision of specialist medical staff. All children who were reported to have habitual snoring were invited to undergo sleep polysomnography assessments for presence of apnea. The sleep polysomnography was performed in the paediatric sleep laboratory in this hospital with an Alice-03 recorder (Healthdyne, Georgia). This included 4 EEG channels, 2 EOG channels, chin and leg EMG, nasal-oral thermistor, thoracic and abdominal bands, pulse oximetry, ECG channel, microphone channel for detection of snoring. All results were manually scored by one of two authors (DN or KK) according to standard criteria[17]. Standard definitions for apnoea and hypopnea were used[18]. Those children who were reported to have sleep bruxism were contacted again one year later for progress of sleep bruxism and snoring.

Fig. 1 Distribution of different diseases amongst snoring and non-snoring children.

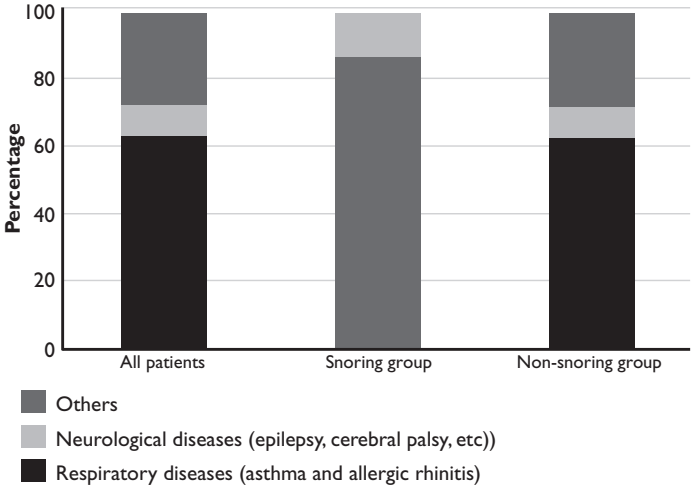

Fig. 2 Relationship between change in snoring and sleep bruxism.

Odd-ratio = 2.0 (95% C.I. 0.11 - 34)

	Improvement in bruxism	No improvement in bruxism
Improvement in snoring	8	2
No improvement in snoring	2	1

STATISTICS

Data were analysed by the Statistical Programs for Social Science, SPSS^{R} for Windows^{TM} (SPSS Inc., Chicago,IL, USA). Numerical data were reported as mean and standard deviation (SD). Fisher's exact test was used to assess correlation between presence of habitual snoring and sleep bruxism. Odds ratios and 95% confidence interval (C.I.) were reported. *P* value of less than 0.05 was considered significant.

RESULTS

Two hundred children were recruited into the study. The male to female ratio of the studied group was 1.5:1 and the mean age of children recruited was 6.4 ± 4.2 years. Twenty-nine of the 200 children (29/200 = 14.5%, 95% C.I. 10-20%) were found to have habitual snoring. It appeared that more boys had habitual snoring (male:female = 1.4:1). The mean age of habitual snorers within the studied group was 6.2 ± 3.1 years. Twenty-five of these 29 children habitual snorers were suffering from respiratory diseases and the remaining four had neurological diseases (Fig. 1). Comparing with those without respiratory and neurological diseases, the prevalence rate of habitual snoring is higher in these two groups, p = 0.003 and 0.019 respectively.

Sleep bruxism was found in 17 children (8.5%, 95% C.I. 5%-13%). Sixteen out of these 17 children also had habitual snoring (p<0.0001). These 17 children's parents were interviewed again one year later. Four could not be contacted. For the remaining 13 children, the changes in symptoms of snoring and sleep bruxism were summarised in Fig. 2. The odd ratio was 2.0, 95% C.I. 0.11-34.

PSG was offered to all children who were found to have habitual snoring. Only 16 of them eventually underwent PSG (16/29 = 55%) within six months of the initial questionnaire survey. Eleven of these 16 children were found to snore at the night of study. Two children (2/16 = 12.5%) were found to have abnormal study with obstructive apnoea/hypopnoea index (AHI) greater than one per hour of sleep[19]. One had AHI of 4 and the other had an AHI of 1.6.

Of the 13 children who did not undergo PSG, six of them could not be contacted after the first interview. The other seven children refused to return for investigation of their snoring. The latter were further interviewed over phone; five claimed that their symptoms had improved. The other two remaining children could not be contacted for the second time.

DISCUSSION

The main difference between this study and previous studies[2-7] is the selected population. In the current study, the children were selected from the outpatient department of a hospital whilst previous studies were drawn from the general population. Hence, the results of the current study would be more relevant to paediatricians attending children who present with medical problems.

In this study of children attending the out-patient clinics in this department, habitual snorers who were at risk of OSAS were identified by nurse-administered questionnaire. In view of limited resources, only habitual snorers were offered sleep polysomnography study in this department. The non-habitual snorers and non-snorers were not studied and this constitutes a major limitation of the current study.

In the current study, the prevalence of habitual snoring was found to be 14.5%. This was higher than that reported from surveys done in the general population of Italy[3] (7.3%, aged six to 13 years); France[6] (10%, aged five to six years); UK[4] (12%, aged four to five years); Iceland[5] (3.2%, age 0.5 to six years), Sweden[7] (6.2%, aged four years). The prevalence of OSAS within our paediatric outpatient population was found to be 1%. The higher prevalence of snoring was probably secondary to the fact that 34% of children attending the out-patient clinics of this department had allergic rhinitis and/or asthma, which were risk factors for habitual snoring[14-16]. In the current study, 11 (69%) of the 16 habitual snorers identified from the questionnaire survey actually snored during the night of sleep study. This was higher than that reported by Ali et al[4], who documented snoring in 22 (33%) of 66 habitual snorers at the night of home sleep studies. The higher positive predictive value for snoring at the night of sleep study in the current study was most likely due to the fact that the questionnaire was administered by nurses who could explain the meaning of snoring whilst the questionnaire of Ali et al[4] was a postal survey.

In this series, snoring was found to be more common in boys, with a male to female ratio of 1.5:1. This is different from previous reports of equal sex distribution amongst habitual snoring children[3,6]. This male predominance was most likely due to two related reasons: children with allergic rhinitis and asthma were the commonest disease in our out-patient department. In Hong Kong, boys were twice more likely to have asthma than girls[20]. For allergic rhinitis, the male to female ratio was 1.3 to 1[20]. Hence, this male dominance in allergic rhinits and asthma would be a confounding factor in the results of snoring as more boys than girls attend the outpatient clinics. Secondly, this male dominance in snoring was further exaggerated by the fact that allergic rhinitis and asthma were reported to be independent risk factors for habitual snoring and OSAS[14-16].

In our study, there was a strong association between bruxism and habitual snoring. This lent support to a a previous study that suggested sleep bruxism being related to the disturbed sleep of patients with sleep-disordered breathing[21]. The fact that eight out of 13 children had improved sleep bruxism and snoring was interesting. A larger study looking into this area is urgently needed as a positive association would make control of snoring a treatment for sleep bruxism.

CONCLUSION

Prevalence of habitual snoring and sleep bruxism was found to be 14.5% and 8.5% respectively in the paediatric outpatient population in a Hong Kong hospital. This was higher than that reported from surveys of the general children population. Prevalence of OSAS was found to be 1% in this out-patient population. Those with allergic rhinitis and/or asthma, neurological diseases were at higher risk. Paediatricians should be aware of these problems and be prepared to manage them. Habitual snoring and sleep bruxism was found to be closely related. Further studies into this relationship are needed.

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