PREVALENCE AND RISKS OF HABITUAL SNORING AND OBSTRUCTIVE SLEEP APNEA SYMPTOMS IN PATIENTS REPORTING TO ORTHODONTICS DEPARTMENT

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Abstract

Objectives: *Objective of this study was to determine prevalence and risks of habitual snoring and obstructive sleep apnea (OSA) symptoms in patients reporting to orthodontics department Khyber college of dentistry Peshawar.*

Materials & Methods: *This cross-sectional study was conducted on 100 consecutive orthodontic patients. Both genders of age 18 to 50 years were included. Patients with cleft lip and palate, expectant women, and those unable to read were all excluded. Subjective and objective assessments were carried out. English version of the Berlin questionnaire was used to screen patients for OSA. An individual was considered at high risk for OSA if he/she scored positive (≥2 points) on 2 of the three categories. Descriptive statistics were computed in SPSS version 20.0. The frequency of participants at risk of OSA was calculated. The frequency of participants at risk for OSA was stratified among age group and genders using chi-square test at P≤0.05.*

Results: *Males were 30(30%), and females were 70(70%). The mean age was 22.4±4.63 years. Eighty three(83%) cases had normal weight (18.5-24.9 Body Mass Index), 12(12%) had under-weight (<18.5 BMI) and 5 (5%) cases were overweight(25-29.9 BMI). Of the total sample, 9% of the cases were at high risk for OSA, and 91% were at low risk for OSA.*

Conclusion: *About 9 % of the patients were at high risk for OSA. The common symptoms were snoring, tiredness, fatigue and day time sleepiness. The orthodontic practitioners are required to regularly screen their patients for obstructive sleep apnea signs and symptoms to give optimal care.*

Key Words: *Obstructive sleep apnea, Body mass index, Risk factors, snoring, orthodontic patients*

Introduction

Sleep apnea is defined as an intermittent cessation of airflow at the nose and mouth during sleep. By convention, apneas of at least 10 s duration have been considered important, but in most patients, they are 15-20 s in length and may last as long as 1-3 min[1]. It can be classified as central sleep apnea - Nerve impulse to all respiratory muscles is absent, Obstructive sleep apnea (OSA) - occlusion of the oropharyngeal airway is seen. And mixed apnea - Central apnea followed by obstructive component[2]. The prevalence of OSA in children is 1%-4%[3] while in middle-aged adults is 2-4%.

The clinical features of OSA include daytime sleepiness, distinct from fatigue, is a common feature of OSA. Sleepiness is the inability to remain fully awake or alert during the wakefulness portion of the sleep-wake cycle, while fatigue is a subjective lack of physical or mental energy that is perceived by the individual or caregiver to interfere with usual and desired activities. It is often unclear whether a patient's complaint of daytime sleepiness rep-

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resents true sleepiness or fatigue[4]. OSA should be approached as a chronic disease requiring long-term, multidisciplinary management. There are medical, behavioural, and surgical options for the treatment of OSA. Ad-junctive therapies are used as needed to supplement the primary treatment options. The patient should be an active participant in the decision on treatment type and taught to contribute to the management of his or her disease. Positive airway pressure (PAP) is the treatment of choice for mild, moderate, and severe OSA and should be offered as an option to all patients. Alternative therapies may be offered depending on the severity of the OSA and the patient's anatomy and risk factors[5].

Al-Jewair et al[6]. conducted a study at the Department of Preventive Dental Sciences, College of Dentistry, University of Dammam, Kingdom of Saudi Arabia and they reported that habitual snoring was present in 18.2% of the females and 81.8% of the males ($p<0.05$). Breathing pauses during sleep of more than once a week occurred in 9% (n=17) of the sample. Of the males, 78.3% were at high risk of OSA compared with 21.7% of the females. Multivariate analysis for risk of OSA revealed that obese patients were almost ten times more likely to report OSA symptoms than their non-obese counterparts (odds ratio: 9.9, 95% confidence intervals: 4.4-22.1). Tongue indentations, tonsil size, and a high Epworth, Sleepiness Scale score, were also independent risks of OSA. Bahammam et al[7] conducted a study at a primary health care centre in King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia and concluded that four hundred women with a mean body mass index of 31.3+7.2 kg/m2 were surveyed in this study. Among the study group, 40.8% reported snoring (every day in 15%, 3-4 times a week in 7.5%, and one-2 times a week in 9.8%). Breathing pauses more than three times per week was present in 22.5%. Hypertension was present in 24.8%. Based on the Berlin Questionnaire stratification for risk of OSA, 39% were considered as high-risk patients for OSA.

OSA screening is an important consideration for orthodontic practitioners. In many instances, the orthodontic procedures and treatment planning may affect the airway which may lead to obstructive sleep apnea. For example, a patient having class III skeletal male relation due to maxillary hypoplasia and prognathic mandible; if such patients have already the features of OSA, the ideal planning will be to maximise maxillary advancement and minimise mandibular setback to prevent airway compromises.

The objective of this study was to determine prevalence and risks of habitual snoring and obstructive sleep apnea symptoms in patients reporting to orthodontics department KCD Peshawar.

Materials and Methods

This cross-sectional study was conducted on consecutive adult dental patients attending the orthodontics department Khyber College of Dentistry, Peshawar from January 2018 to July 2018. The study was approved by the ethical committee of the hospital. A sample of 100 was used to determine the prevalence of OSA risk.

The inclusion criteria were an adult female and male patients between the age of 18 and 50 years, who presented for orthodontic treatment. Patients younger than 18 years had craniofacial anomalies such as cleft lip and palate, expectant women, and those unable to read were all excluded. Eligible patients were invited to participate and signed informed consents were obtained. Subjective and objective assessments were carried out.

Patients were asked to complete a structured questionnaire that asked about habitual snoring and risk of OSA were assessed using the English version of the Berlin questionnaire,2 which was previously tested and validated. The Berlin questionnaire6 is a 10-item survey in which questions are divided into three categories (category 1 [snoring], category 2 [fatigue and sleepiness], and category 3 [hypertension with >140/90 mm Hg], and body mass index). An individual was considered at high risk for OSA if he/she scored positive (≥2 points) on 2 of the three categories. Habitual snoring was defined as a snoring frequency of 3-4 times per week or more. The questionnaire was self-administered and filled anonymously by patients in the waiting area.

Data were analysed using SPSS version 20.0. Frequencies and percentages were calculated for categorical variables like gender, all items of the Berlin questionnaire. Mean, and the standard deviation was calculated for a numerical variable like age. The frequency of participants at risk of OSA was calculated. The frequency of participants at risk for OSA was stratified among age group and genders using chi-square test at $P\leq0.05$.

Results

In this study total participants were 100 in which males were 30(30%), and females were 70(70%). The mean weight, height and age were 56.35±8.38 Kg, 5.382±0.31 m, and 22.4±4.63 years respectively. Details are given in table 1. The most common age group was 18-25 years (n=85, 85%) followed by 26-30 years (n=11, 11%). The least number of participants were age group of 41-45 years (n=4, 4%). (table 2). Our findings showed that 83(83%) cases had normal weight (18.5-24.9 BMI), 12(12%) had underweight (<18.5 BMI) and 5 (5%) cases were overweight(25-29.9 BMI). (Fig 1). Of the total sample, 9% of the cases were at high risk for OSA, and 91% were at low risk for OSA. (Fig 2).

Responses of the participants to the Berlin questionnaire were as 22% of participants responded positively to snoring. 14 % reported that their snoring is slightly louder than breathing and 7% reported that their snoring is as loud as talking. 7% responded that they snore nearly every day, 6% reported that they snore three to four times a week and 4% reported that they snore one to two times a month. 3% of the participants reported that their snoring bothers other people. 3% cases reported that they quit breathing three to four times a week during sleep, 4% reported that they quit breathing one to two times a week and 8% reported that they quit breathing one to two times a month. 21% cases responded that they feel tired after sleep nearly every day, 8% reported that they feel tired three to four times a week, 23% reported one to times a week, and 14 % reported that they feel tired after sleep one to two times a month. 21% participants responded that they feel tired during walking nearly every day, 12% reported that they feel tired during walking three to four times a week, 19% reported one to two times a week, and 12% reported that they feel tired while walking one to two times a month. 18% of the participants responded that they fallen asleep while driving and of this 4% reported that this occurs three to four times a week, 3% reported that this occurs one to two times a week and 4% reported that this occurs one to two times a month. 4% of the participants reported that they have high blood pressure.

Of the total sample, 9% of the cases were at high risk for OSA, and 91% were at low risk for OSA. Fig 2

Table 1: Descriptive statistics of weight, height and age

	Minimum	Maximum	Mean±SD
Weight	44	79	56.35±8.38
Height	4.9	6.1	5.382±0.31
Age	18	44	22.4±4.63

Table 2: Age distribution of the sample

Age group	Frequency	Per cent
18-25	85	85
26-30	11	11
41-45	4	4

Fig: 1 Frequency of BMI classes

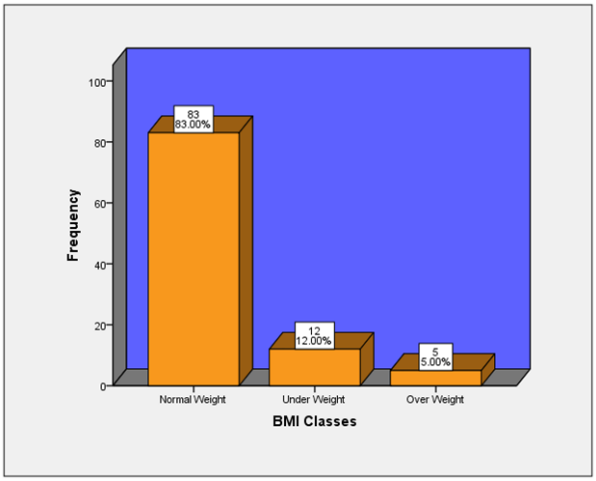
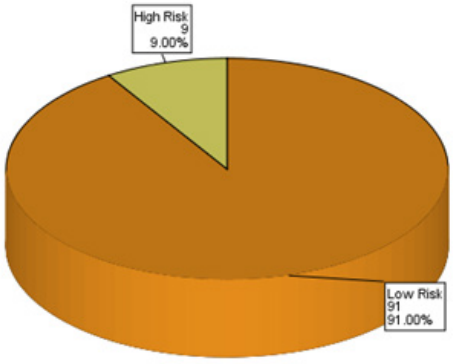


Fig: 2 Frequency of OSA patients at risk



Discussion

Screening of OSA is an important perspective for orthodontic practitioners. In many instances, the orthodontic procedures and treatment plannings may affect the airway which may lead to obstructive sleep apnea. For example, a patient having class III

Table 3: Responses of participants the Berlin questionnaire Category 1

Do you snore?	Frequency	Per cent
Yes	22	22
No	74	74
I don't know	4	4
Your snoring is		
Nil	79	79
Slightly louder than breathing	14	14
as loud as talking	7	7
How often do you snore?		
Nil	83	83
Nearly everyday	7	7
Three to four times a week	6	6
One to two times a month	4	4
Has your snoring ever bother other people?		
Nil	83	83
Yes	3	3
No	14	14
Has anyone noticed that you quit breathing during your sleep?		
Three to four times a week	3	3
one to two times a week	4	4
One to two times a month	8	8
Never or nearly never	85	85

Table 4: Responses of participants the Berlin questionnaire Category 2 & 3

How often do you feel tired or fatigued after your sleep?		
Nearly everyday	21	21
Three to four times a week	8	8
one to two times a week	23	23
One to two times a month	14	14
Never or nearly never	34	34
During your waking time, do you feel tired, fatigued, or not up to the par?		
Nearly everyday	21	21
Three to four times a week	12	12
one to two times a week	19	19
One to two times a month	12	12
Never or nearly never	36	36
Have you ever nodded off or fallen asleep while driving a vehicle		
Yes	18	18
No	82	82
how often does this occur?		
Nil	78	78
Three to four times a week	4	4
one to two times a week	3	3
One to two times a month	4	4
Never or nearly never	11	11
Do you have high blood pressure?		
Yes	4	4
No	96	96

skeletal male relation due to maxillary hypoplasia and prognathic mandible; if such patients have already the features of OSA, the ideal planning will be to maximise maxillary advancement and minimise mandibular setback to prevent airway compromises.

This study was conducted on orthodontic patients presented for correction of various malocclusions. In our study, the females were more than males. This is mainly because females are more cautious about their dentofacial appearance and hence more presentation for the treatment. A study conducted by Rohra et al. 8 on Sleep-disordered breathing in children seeking orthodontic care had more males than females. This difference in the result of our study may be due to a difference in the education level and sample size.

Our findings showed that the mean age was 22.4±4.63 years. In our population most of the pa-

tients presenting for treatment late second and early third decade. The mean age in Al Jewaire et al. study was 34.7 ± 11.2 years. The difference in the mean age from our results may be because Al Jewaire et al. 6 conducted their study on dental patients, not orthodontic patients.

Our findings showed that 83% of cases had normal weight followed by underweight and few cases were overweight. A study conducted by W.Lee et al. 9 on differences in craniofacial structures and obesity in Caucasian and Chinese patients with obstructive sleep apnea reported that overweight patients were more in contrast to our study. The variation in the results of Lee et al. 9 from our study may be due to ethnicity, genetic and environmental factors.

About one-third of the patients reported that they snore, some responded that they feel tired during walking and about four patients were hypertensive. Young et al. 10 in a study on risk factors for obstructive sleep apnea in adults and reported high prevalence(83%) of hypertensive patients. These results are different from the current study. This difference is due to that they selected older age patients in their study as compared to our study in which we selected young patients.

Conclusion

- About 9 % of the patients were at high risk for OSA.
- The common symptoms were snoring, tiredness, fatigue and day time sleepiness.
- The orthodontic practitioners are required to regularly screen their patients for obstructive sleep apnea signs and symptoms to give optimal care.

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