

A HOSPITAL BASED PRELIMINARY REPORT ON SLEEP DISORDERED BREATHING IN PAKISTANI POPULATION

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Background: Sleep Disordered Breathing is an important medical condition leading to significant morbidity and mortality. Western studies have shown its prevalence in middle age to be 9% in women and 24% in men. The aim of this study was to have a preliminary assessment on the frequency of Sleep Disordered Breathing in Pakistani subjects. **Method:** Patients attending a medical clinic were surveyed. A sleep questionnaire elicited information about snoring, witnessed apnoea, nocturnal choking and excessive daytime sleepiness. Data were recorded for age, height, collar size and weight. Epworth Sleepiness Scale was used to assess excessive daytime sleepiness. Statistical analysis was by chi square test, t-test and Fisher's exact test. A p -value less than 0.05 was considered significant. **Results:** A total of 123 subjects (M:F= 2:1) were included in the study. The frequency of snoring was found to be 46%. Snoring with apnoea was reported in 7% and snoring with apnoea and excessive daytime sleepiness in 3%. Snorers were more obese ($p<0.001$), older ($p<0.003$), with higher body mass index ($p<0.001$) and larger collar size ($p<0.006$) than non-snorers. Hypertension was more common in patients with sleep disordered breathing (35%) as compared to those without (16%). **Conclusions:** This is the first preliminary data on sleep disordered breathing from Pakistan that reflects that the prevalence is similar to that seen in the West. The risk factors and association with hypertension are also comparable.

Key Words: sleep disordered breathing; obstructive sleep apnoea; snoring; prevalence; Pakistan.

INTRODUCTION

Sleep disordered breathing (SDB) are disorders of breathing during sleep whose importance has been increasingly recognized over the last two decades¹. They disrupt sleep but generally are not manifest during wakefulness. The commonest disorders in the spectrum of SDB include snoring and obstructive sleep apnoea (OSA).

Obstructive Sleep Apnoea (OSA) is characterized by repeated episodes of complete upper airway obstruction during sleep. The cardinal features include snoring, apnoeic spells and sleep fragmentation. Fatigue, morning headache, and loss of concentration, judgment and memory are other associated clinical features². The term obstructive sleep apnoea syndrome (OSAS) is used when OSA is accompanied with excessive daytime sleepiness (EDS).

SDB has been increasingly recognized as an important medical condition leading to significant morbidity and mortality. This is related to the presence of twice as much hypertension, three times as much ischaemic heart disease and four times as much cerebrovascular disease in patients with OSA¹. Unrecognised OSA is also reported to be a cause of increased mortality from highway and industrial accidents³.

SDB is prevalent among adults and the incidence rises with age. The estimated prevalence of SDB in middle-aged adults is 9% for women and 24% for men⁴. Currently there are no published data from Pakistan on the prevalence of SDB in our population. We conducted a hospital based questionnaire study at The Aga Khan University Hospital (AKUH) to assess the frequency of OSA in Pakistani subjects.

MATERIALS AND METHODS

Consecutive patients attending AKUH for an executive medical check-up during the months of August and October 1998 were surveyed for their sleeping habits. All the patients completed a sleep questionnaire. A medical student was trained to administer the questionnaire reproducibly. The subjects were asked about the history of snoring, witnessed apnoea, nocturnal choking, morning headaches and excessive daytime sleepiness. History of nasal blockage, nasal or

oral surgery, drug and alcohol intake, and smoking habits were noted. Data were also recorded for age, sex, height, collar size, weight and occupation.

We evaluated EDS by having each subject fill the Epworth Sleepiness Scale (ESS) form (Table-1).

This questionnaire assesses the likelihood of falling asleep in a variety of situations. Score of ESS can range from 0–24, and scores of more than 9 have been found to correlate well with the severity of SDB⁵.

Table-1: EPWORTH SLEEPINESS SCALE

How likely are you to doze off or fall asleep in the following situations, in contrast to just feeling tired?

0= Would never doze

1= Slight chance of dozing

2= Moderate chance of dozing

3= High chance of dozing

SITUATION	CHANCE OF DOZING
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. a theatre or meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting quietly after a lunch without alcohol	
Sitting and talking to someone	
In a car, while stopped for a few minutes in the traffic	

Data were collected using a standardized data form. Data were initially entered in an institutional software program (EPI INFO version 6) and finally analysed by statistical software, SPSS. Statistical analysis was by chi square test, t-test and Fisher’s exact test. A *p*-value less than 0.05 was considered significant.

RESULTS

The study included 123 subjects, 83 male and 40 female (M:F= 2:1). Mean age was 43.2±11.9 years. The mean height and weight were 165±8.9 cm and 72±15.2 kg respectively. The mean Body Mass Index (BMI) was calculated to be 26.2±4.6, and collar size was 37.8±4.4 cm. Snoring was reported in 46%, witnessed apnea in 9% and excessive daytime sleepiness in 20% of the study population. Snoring with apnea was reported in 7%, and snoring with apnea and EDS in 3% of the study population. ESS score was found to be 2.8±2.6. Mean systolic blood pressure was 124.3±15.7 and diastolic blood pressure was 80.8±10.7 mmHg.

Table-2: Characteristics of snorers vs. non-snorers

Factors	Snorer	Non-snorer	P value
Age (years)	46.6±10.5	40±12.4	0.003*
Height (cm)	166.6±9.8	163.6±7.8	0.073
Weight (Kg)	77.3±14.5	67.5±14.4	< 0.001*
BMI	27.7±4.2	24.8±4.5	0.001*
Collar size (cm)	39.1±4.3	36.8±4.3	0.006*
<i>Witnessed Apnea</i>			
Yes	14%	4.54%	
No	85.9%	95.4%	0.006*
Excessive Daytime Sleepiness			
Yes	22.8%	16.6%	
No	77%	83.3%	0.391

Results are expressed as mean±standard deviation, or as percentage.

*Denotes statistically significant *p* value.

Table-2 highlights differences between snorers and non-snorers. Snorers were significantly more obese, older, had higher BMI and larger collar size than non-snorers. Hypertension was significantly more common ($p=0.01$) in patients with SDB (35% of subjects with symptoms of SDB as compared to 16% of the subjects without SDB).

DISCUSSION

The reported prevalence of SDB varies in different communities^{4,6,7}. These discrepancies have largely been attributed to the methodological difficulties in characterizing these syndromes in large populations⁸. This is the first preliminary report that has evaluated the prevalence of sleep disordered breathing in Pakistani subjects. The prevalence of snoring was found to be 46%, snoring with apnea 7%, and snoring with apnea and EDS 3%. These results are very similar to those of Western studies that show a prevalence of OSA as 9% for women and 24% for men⁴.

Snoring is a common phenomenon seen in about 20% of the adult population and in about 60% of men over 40 years of age¹⁰. In our study, snoring was reported in 46% of the population and tended to increase with advancing age. Snorers had significantly higher BMI and neck circumference. Witnessed apnea was significantly more common among snorers. These findings were similar to those in Western studies^{4,9,11}. The prevalence of OSAS in West is 2% in women and 4% in men⁴. Our study indicates that the frequency OSAS among Pakistani subjects was 3%.

Hypertension has been associated with OSA in large population based studies¹². This association is independent of age, sex and obesity^{12,13,14}. The prevalence of hypertension in patients with sleep apnea has been estimated to be very high (50% to 90%) and conversely, the prevalence of sleep apnea in hypertensives has been found to be around 20% to 30%^{15,16,17}. The treatment of sleep apnea has been shown to improve the control of blood pressure in poorly controlled hypertensives¹⁸. In our study, hypertension was seen more commonly in patients with SDB (35% vs. 16%).

There are about 12 major prevalence studies of OSA⁹. Most of them used a sleep questionnaire followed by an evaluation of sleep disordered breathing by overnight polysomnography or oximetry. A critique of our methodology would raise two important issues. Firstly, we used only the questionnaire and secondly, most published studies are drawn from large populations, whereas we used only our executive patients as a sample of our large population. This was a preliminary study and was aimed at defining the magnitude of SDB in Pakistani subjects. Limited sample size and absence of objective evaluation may actually lead to a low estimate of the problem of SDB in Pakistan. This initial study needs to be expanded to include a bigger sample size and an objective evaluation.

CONCLUSION

This is the first report on SDB from Pakistan. It highlights that SDB may be as prevalent in Pakistani population as in West. The condition remains under diagnosed due to lack of knowledge among physicians. The risk factors for SDB were also shown to be comparable to the western population. The main symptoms of sleep apnoea are snoring, apnoeic episodes and disturbed sleep which results in EDS and poor daytime performance. Larger studies complemented by objective evaluation of SDB are warranted in our region.

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