

# Prevalence Of Symptoms Of Obstructive Sleep Apnea In Patients Attending An Inner City Primary Care Clinic.

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## Citation

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## Abstract

**Background:** Obstructive Sleep Apnea (OSA) is an under diagnosed condition. Patients(pts) are not routinely screened for symptoms (sx) of OSA as a part of their initial medical evaluation. We did a prospective study to determine the prevalence of such symptoms in pts attending a medical clinic in the inner city hospital.

**Methods:** During January to August 2005, adult pts attending one of the hospitals primary care clinics were evaluated. A physician administered the Berlin questionnaire for screening for symptoms of OSA to pts who consented to participate. The questionnaire included history of snoring, morning fatigue, excessive daytime somnolence, and falling asleep while driving. Patients with prior diagnosis of OSA were excluded.

**Results:** 108 pts participated in the study and 104 completed the study. 4 were excluded due to insufficient data. There were 42 males and 62 females. The mean age was 54 years. The prevalence of symptoms of (OSA) in this group of pts was 35.58%. Among the pts with sx, 75.7% were Hispanics, 18.9% were Afro-Americans, and 4.6% were of other ethnicity. **Conclusions:** Significant number of patients attending Primary care clinic in the inner city have undetected symptoms of OSA which need further evaluation with polysomnography and specific treatment. As OSA is a serious condition and can have a significant impact on the control of co morbid conditions such as Hypertension, Diabetes, Asthma and cardiac disease, screening for these symptoms is recommended during initial medical evaluation of adult patients.

## INTRODUCTION

Sleep apnea was once considered a medical curiosity, but several studies have now shown that Sleep disorders of breathing are a major public health problem with a significant impact on health. Besides causing excessive daytime sleepiness leading to accidents, OSA is known to contribute to the risk of stroke, angina and myocardial infarction and in addition aggravate left heart failure.<sup>1</sup>

Based on several studies the prevalence of OSA ranges from 1% to 10%<sup>2,3</sup>.

The prevalence of symptoms and signs of OSA in the community varies by region and ethnicity. Prevalence of OSA appears to be more in USA as compared to Europe<sup>3</sup>. OSA represents a public health problem that directly and indirectly results in considerable health care costs which is comparable to that of cigarette smoking. The estimated prevalence of sleep disordered breathing as obtained from the Wisconsin Sleep Cohort study was 9% for women and 24% for men across all age groups. Between 30 and 60 yrs of age 2% of women and 4% of men met the minimal

diagnostic criteria of OSA with a male: female ratio for the prevalence of Sleep disordered breathing of 3:1.

Obesity, older age and male gender are strong risk factors for OSA. Other risk factors include increased neck circumference, craniofacial abnormalities, hypothyroidism and acromegaly.<sup>2,3,4</sup> Unfortunately (OSA) is still an under diagnosed condition. Patients are not routinely screened for symptoms of OSA as a part of their initial medical evaluation. Here we present a pilot study where we used the Berlin Questionnaire to survey patients attending a primary care clinic and found a significant prevalence of symptoms suggestive of OSA. Berlin Questionnaire provides a well validated means of identifying patients who are at high risk for OSA and would need further evaluation.

## METHODS

During January to August 2005, adult pts attending one of the hospital's primary care clinics were evaluated. Following IRB approval and informed consent, a physician independent of the clinic administered the Berlin questionnaire for screening for symptoms of OSA to pts.

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The questionnaire included questions regarding history of snoring, morning fatigue, excessive daytime somnolence, and falling asleep while driving. Patients with prior diagnosis of OSA were excluded.

Neck size, body weight and blood pressure were also obtained. The data was analyzed using the SAS software. Risk categorization was done based on the Berlin questionnaire<sup>5</sup>. The survey asks questions related to in three symptom categories which include snoring, daytime sleepiness, history of high blood pressure and BMI calculated from reported height and weight. Category 1 is considered as significant when 2 or more questions related to snoring are present for at least 3 to 4 times/ week. Category 2 is considered as significant when patients have wake time sleepiness and or drowsiness while driving 3 to 4 times/ week and Category 3 if patient has history of high blood pressure or if BMI is more than 30 kg/m. If the patient had persistent symptoms in at least two categories, the patient was considered to be at high risk for OSA..

### RESULTS

108 pts participated in the study and 104 completed the study. 4 patients were excluded due to insufficient data. The data was analyzed statistically by the MEANS procedure using SAS software. None of these patients reported having been ever asked to provide a sleep history at prior medical visits. There were 42 males and 62 females. The mean age was 54 years. There were more females in both groups; In patients with symptoms of OSA, there were 62% females and in the group without symptoms of OSA, there were 59.7% females .In both groups there were predominantly Hispanics; 75.6% in the group with symptoms and 53.7% in the group without symptoms.(Table 1) The prevalence of symptoms of (OSA) in this group of pts was 35.58%. Symptoms of OSA were more prevalent in Hispanics (75%) as compared to African Americans (18%). Physical characteristics of the two groups are seen in Table 2. Neck circumference in pts with symptoms of OSA 39.45 cm compared to 38.1 cm in pts without symptoms of OSA (p value 0.25). BMI was 32.7 in patients with symptoms compared to 29.8 in patients without symptoms (p value 0.07). Interestingly 11% of patients with symptoms were smokers in comparison to 30% in patients with no symptoms of OSA (p value 0.03). Alcohol intake history was not significantly different in the two groups.

**Figure 1**

Table 1: Demographics of Patients Attending Primary Care Clinic

Variables	Patients with symptoms of OSA	Patients without symptoms of OSA	P Value
Neck Circumference in Centimeters	39.45	38.1	0.25
BMI	32.74	29.80	0.07
Smoking			
Yes	4(11%)	20(30%)	0.03
No	33(89%)	47(70%)	
Alcohol			
Yes	3	7	0.38
No	34	60	

**Figure 2**

Table 2: Characteristics of Patients Attending Primary Care Clinic

Variables	Patients with Symptoms of OSA (n=37)	Patients with no Symptoms of OSA (n=67)	P Value
Age	53.7	54.3	0.84
Sex			
Male	15 (38%)	27(40.2%)	0.08
Female	22 (62%)	40(59.7%)	
Ethnicity			
Hispanic	28(75.6%)	36(53.7%)	0.003
African American	7(18.9%)	29(43.2%)	
Others	2(5%)	2(2.9%)	

### DISCUSSION

Despite the advances in our understanding of Sleep pathophysiology, Sleep apnea remains an under diagnosed and serious illness that can have an impact on the morbidity and mortality of several conditions, treated by the primary care physician. On the basis of the clinically diagnosed and screen detected prevalences Young et al estimated that in 93% of women and 82% of men with moderate to severe OSA, the diagnosis was missed<sup>6</sup>. The estimated prevalence of sleep disordered breathing was 9% for women and 24% for men. A telephone interview survey of a United Kingdom population sample showed that based on the minimal criteria of the International Classification of Sleep Disorders 1.9% of the sample had OSA<sup>7</sup>. Berlin questionnaire is a well validated instrument used to identify patients at risk for the Sleep apnea syndrome<sup>5</sup>. This survey asks the patients about the risk factors for sleep apnea ; namely snoring, wake time sleepiness or fatigue and the presence of obesity and

hypertension. The predictive ability of the Berlin questionnaire has been shown to be higher when body mass index and high blood pressure(symptom category 3)are used in combination with snoring(symptom category 1) or daytime sleepiness (symptom category 2) rather than alone. Several studies have reported on the prevalence of snoring and sleep disordered breathing in the community, using various questionnaires<sup>8,9,10</sup>. Prevalence of symptoms of OSA in patients attending a primary care clinic in our inner city hospital, was found to be higher in our study as compared to most other studies. Our patient sample was predominantly Hispanic with more females. Marin et al reported from a study on adult Spanish population that sleep apnea was quite common. In this study, 0.8% of women and 2.2% of men met the criteria of OSA based on snoring, daytime sleepiness and nocturnal oximetry . Adults with sleep apnea were more likely to be older, smokers, and more likely to be males with obesity and larger necks and have higher alcohol consumption<sup>11</sup>. They also found a direct relationship between snoring, neck circumference and obesity. In our study, BMI and Neck circumference did not meet statistical significance as our sample size is smaller compared to other studies. Neck circumference corrected for height is more useful a predictor of OSA than general obesity, but by itself it does not obviate the need for sleep studies<sup>12</sup>. Smoking was found to be less frequent in patients with symptoms of OSA than in patients with out symptoms which is also different from other studies so far published. This may be due to vigorous tobacco cessation counseling especially in asthmatics. We have observed a high prevalence of asthma and obesity and OSA in our population. Evidence from methodologically strong cohort studies indicates that OSA is independently associated with increased likelihood of hypertension, cardiovascular events of all causes strokes, motor vehicle accidents, and diminished quality of life<sup>13,14</sup>. Given the high prevalence of OSA in the general population it is important that primary care physicians identify patients at risk and refer them for further evaluation such as Polysomnography which is the standard diagnostic test. This test is labor intensive, time consuming and not so easily available to all patients especially with insurance limitations. Hence screening of patients using an adequate sleep history is essential. A significant proportion of patients with occult SDB in the general population would be missed if screening was based on body habitus or male sex alone. A detailed sleep history and better understanding of predictive factors is needed especially in the older adults. Sleep disordered breathing has also been shown to be common in patients

with type 2 diabetes. In one study, using the Berlin questionnaire, 56% of the patients with Type 2 diabetes were noted to be at risk for OSA. Of these 27% of the patients were confirmed to have significant OSA requiring treatment. Overall prevalence of OSA in the diabetes population was estimated at 23% compared with 6% in a community based prevalence study<sup>15,16</sup>. In yet another study, Punjabi reported that SDB is independently associated with glucose intolerance and resistance<sup>17</sup>. An association has also been shown between hypertension and sleep apnea which is independent of obesity, age, and sex in a non-selected community based adult population<sup>18</sup>. Strategies for early diagnosis and treatment of OSA and associated morbidity are critically needed. SDB is a serious condition which has been shown to have a significant impact on the control of co morbid conditions such as Hypertension, Diabetes, Asthma and cardiac disease. Sleep history is the key to the recognition of patients with potentially treatable sleep disorders. In the Primary care clinic, sleep history Sleep history is not a standard part of the outpatient questionnaire. A study evaluating the frequency of sleep histories during encounters with simulated patients showed that sleep histories were not commonly obtained by uninstructed physicians<sup>19</sup>. In yet another study only 6% of the charts documented a sleep history when 575 of the patients reviewed were at risk for OSA. Chart reminders have been shown to identify problems and remarkably improve the physician performance in screening for problems such as cigarette smoking, and cancer screening and may be a simple way to elicit a sleep history influence outcomes<sup>20,21</sup>. Very few medical schools provide meaningful education about sleep physiopathology and this may be another area for improving physician awareness. We realize the limitations in our study such as small sample size, lack of information about patients who did not participate in the survey and a possible selection bias. Although we did not perform polysomnography in these patients other studies have confirmed the presence of OSA in patients who have been identified to be at risk for OSA using such questionnaire. Larger sample sizes will only further substantiate a finding which is already very clear. Despite the small size of this pilot study, we still report these findings, because it is obvious that several patients attending the primary care clinics have undetected symptoms indicating risk for SDB which merit further evaluation. Sleep disordered breathing can have an adverse effect on the treatment and outcome of patients attending a primary clinic. It is therefore essential that questions regarding sleep history be made a mandatory

part of the initial evaluation of patients. Sleep problems should be prioritized and major changes in physician education undertaken.

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