Original Article

Psychiatric Manifestations in the Patients of Obstructive Sleep Apnea at Tertiary Care Center of Northern India

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Abstract

Aim: The aim of the study is to understand the role of anxiety and depression in obstructive sleep apnea (OSA) patients. **Patients and Methods:** This prospective, observational study was conducted at King George's Medical University, Lucknow, Uttar Pradesh, India, from September 2011 to August 2012. Seventy-one patients were enrolled in the study after obtaining informed written consent. Polysomnography (PSG) was performed to confirm OSA, and the psychiatric features were determined using the Hospital Anxiety and Depression Scale score. **Results:** A total of 71 individuals were enrolled in the study, and after exclusion, 48 individuals had participated in PSG. Of the 48 patients, 44 (91.67%) had shown OSA with PSG. From 44 OSA-diagnosed patients, 10 (22.73%) patients were diagnosed of having psychiatric manifestations (50% with depression, 30% with anxiety, and 20% having features of both depression and anxiety). No significant difference was found in between those with psychiatric features than that those without in body mass index (mean ± standard deviation [SD]: 32.38 ± 7.17 and 31.64 ± 3.93, $P = 0.610$), Epworth's sleepiness scale score (mean ± SD: 13.20 ± 4.71 and 11.88 ± 5.63, $P = 0.505$), apnea/hypopnea index (mean ± SD: 48.01 ± 31.71 and 37.81 ± 22.84, $P = 0.263$), average saturation (mean ± SD: 92.19 ± 4.37 and 91.74 ± 4.38, $P = 0.774$), and lowest saturation (mean ± SD: 74.50 ± 11.97 and 74.32 ± 11.97, $P = 0.968$), respectively. **Conclusion:** Although patients with OSA must be screened for psychiatric manifestations, the severity of OSA is not directly related to the severity of psychiatric features.

Keywords: Apnea/hypopnea index, Epworth's sleepiness scale, obstructive sleep apnea, polysomnography, psychiatric manifestations

Introduction

Obstructive sleep apnea (OSA) is an important health problem that affects approximately 10% of the population in the world.[1] It is characterized as a breathing disorder and is caused by the intermittent collapse in upper airway during sleep.[1,2] It is typically associated with excessive daytime sleepiness (EDS), associated with bad sleep quality, and associated with compromised daytime function.[3] OSA is diagnosed via monitoring of respiratory, sleep, and cardiac parameters at night.[2] Polysomnography (PSG) is an important method to detect OSA.[4] An apnea-hypopnea index (AHI) of >5/h of sleep recording by PSG confirms the diagnosis of OSA. Tarraubella *et al*. have reported that only around 10% of people with OSA are diagnosed and treated. This gap causes serious public health concern.

Hospital Anxiety and Depression Scale (HADS) score is a reliable method to assess the anxiety and depression in different clinical examination and populations.[5] Neuropsychological symptoms include concentrating problem, quickness, cognitive impairment, depression, and other psychological disorders. Few studies have shown that higher rates of anxiety and depression in OSA patients are due to neural injury and increased with disease severity, but some studies had rejected the phenomenon.[6-9] The relationship between OSA and psychiatric manifestations is under-represented or not well defined. Thus, in this study, we aimed to assess not only the psychiatric manifestations in OSA patients but also examine the correlation between the associated variables and symptoms.

Patients and Methods

Seventy-one individuals attending the Outpatient Department (OPD) of Respiratory Medicine at King George's Medical University, Lucknow, Uttar Pradesh, India, from

Access this article online

Quick Response Code:

Website: www.ijrconline.org

DOI: 10.4103/ijrc.ijrc_56_18

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How to cite this article: Kant S, Kapoor N, Verma AK, Verma SK, Kushwaha RA, Kumar S, *et al*. Psychiatric manifestations in the patients of obstructive sleep apnea at tertiary care center of Northern India. Indian J Respir Care 2019;8:84-6.

Received: 24-12-2018 **Revised:** 16-02-2019 **Accepted:** 10-03-2019

September 2011 to August 2012, were included in the study based on their clinical symptoms for OSA. Informed written consent was obtained from all the patients before enrolling in the study.

Of 71 participants, 23 were excluded since seven patients were diagnosed with hypothyroidism and 16 did not participate in PSG. The remaining 48 patients of suspected OSA were interviewed on the basis of standardized Berlin questionnaire. The patients and their caregivers were asked history or presence of hypertension, snoring, and breathing cessation while sleeping, tiredness, and sleepiness at the time of driving. The daytime sleepiness was estimated by Epworth's sleepiness scale (ESS) score. Based on the response to the questionnaire and ESS score, patients having high risk underwent overnight PSG for confirmation of the diagnosis of OSA. AHI was used for the diagnosis and assessment of severity of OSA.

Further, these patients were screened for anxiety and depression using the HADS score. In the present study, we had divided the patients into two groups according to HADS score: Group A (normal, HADS score ≤10) and Group B (symptomatic, HADS score ≥11). The schematic representation of the whole work-flow is shown in Figure 1. The statistical analysis was performed using Statistical Package for the Social Sciences Version 15.0 (SPSS, Version 15.0. Chicago, SPSS Inc.) statistical analysis software.

Results

PSG of 48 participants was performed. Of these, 44 (91.67%) participants were diagnosed as OSA with AHI >5. The characteristics of the patients are shown in Table 1.

In addition, these 44 patients diagnosed with OSA were screened for anxiety and depression using HADS score. Of 44 patients, only 10 (22.73%) patients were suffering from anxiety and depression. Five patients (50%) had depression, three patients (30%) had anxiety, and the rest two patients (20%) had features suggestive of both depression and anxiety.

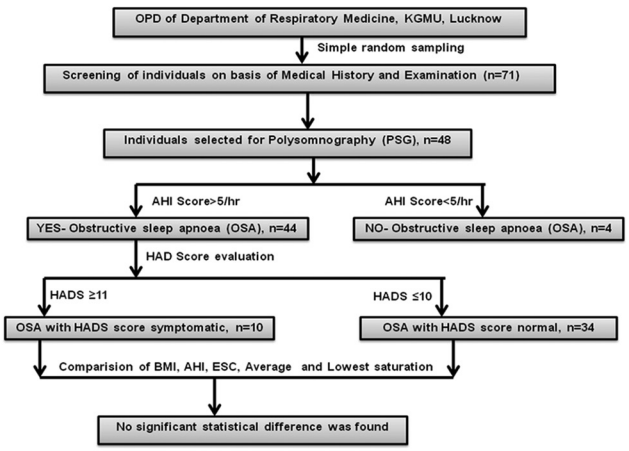

Figure 1: Schematic representation of the work-flow

Patients diagnosed to have OSA were further divided into two groups; Group A: Patients having anxiety and/or depression or HADS score asymptomatic (n = 10) and Group B: Patients who were not associated with anxiety and/or depression or HADS score normal (n = 34). There was no statistically significant difference between the two groups in terms of body mass index (BMI) (mean ± standard deviation [SD]: 32.38 ± 7.17 and 31.64 ± 3.93, P = 0.610), ESS (mean ± SD: 13.20 ± 4.71 and 11.88 ± 5.63, P = 0.505), AHI (mean ± SD: 48.01 ± 31.71 and 37.81 ± 22.84, P = 0.263), average oxygen saturation (mean ± SD: 92.19 ± 4.37 and 91.74 ± 4.38, P = 0.774), and lowest oxygen saturation (mean ± SD: 74.50 ± 11.97 and 74.32 ± 11.97, P = 0.968), respectively. The detailed statistical analysis is shown in Tables 2 and 3.

Discussion

Our study showed that although OSA is associated with psychiatric manifestations, no significant correlation was found

Table 1: Patient's characteristics

Characteristics	*n* (%)
Sex	
Male	37 (84.1)
Female	7 (15.9)
Symptoms	
Snoring	40 (90.9)
EDS	32 (72.7)
Body mass index	
<25	1 (2.2)
25-29.9	16 (36.4)
>30	27 (61.4)
Mallampati grade	
1	0 (0)
2	2 (4.5)
3	22 (50)
4	20 (45.5)
Apnea/hypopnea index	
5-15	10 (22.7)
15-30	6 (13.6)
>30	28 (63.6)

EDS: Excessive daytime sleepiness

Table 2: Comparison of body mass index in obstructive sleep apnea patients with (Group A) and without (Group B) psychiatric manifestations

BMI (kg/m^2)	Group A (n=34) *n*	Group B (n=10) *n*	Statistical significance (P)
18.5-24.9 kg/m^2, normal weight, *n* (%)	1 (2.94)	0 (0)	0.842
25-29.9 kg/m^2, overweight, *n* (%)	12 (35.29)	4 (40)	
BMI >30 kg/m^2, obese, *n* (%)	21 (61.76)	6 (60)	
BMI (kg/m^2), mean±SD	31.64±3.93	32.38±4.17	P=0.610

BMI: Body mass index, SD: Standard deviation

Table 3: Comparison of Epworth's sleepiness scale, apnea/hypopnea index, average and lowest saturation in patients with obstructive sleep apnea with and without anxiety and depression

	Mean±SD		*P*
	Group-A (*n*=34)	Group-B (*n*=10)	
ESS	11.88±5.63	13.20±4.71	0.505
AHI score	37.81±22.84	48.01±31.71	0.263
Average oxygen saturation (%)	91.74±4.38	92.19±4.37	0.774
Lowest oxygen saturation (%)	74.32±11.97	74.50±12.08	0.968

ESS: Epworth's sleepiness scale, AHI: Apnea/hypopnea index, SD: Standard deviation

between EDS, BMI, AHI, average and lowest saturation, and severity of psychiatric symptoms. Sleep fragmentation which occurs due to recurrent arousals during sleep, associated with apnea and hypopnea, is the primary cause of EDS in OSA patients and is suggested as a cause of depression in these patients. The clinical relationship between OSA and depression is of particular concern as many symptoms of OSA and depression overlap causing under-diagnosis of OSA in depressed patients. Sedative antidepressants and adjunct treatment for depression may actually exacerbate OSA. Drugs such as hypnotics are given to treat insomnia (depressive disorder) which might further reduce the muscle tone in the already functionally impaired upper airway dilator muscles. They may blunt not only the arousal response to hypoxia and hypercapnia but also increase the arousal threshold for the apneic event and hence increases the number and duration of apnea.[10,11] Some neuroimaging studies have demonstrated that depression may worsen neuronal injury accompanying OSA and may expand damage in the region controlling effect and cognition.

Various studies have found a positive link between OSA and depression. Guilleminault[11] reported that 24% of 25 male patients with OSA had previously seen a psychiatrist for anxiety and/or depression. Reynolds *et al*.[12] have concluded that around 40% of 25 male OSA patients met the research diagnostic criteria for an affective disorder, with a higher risk of depression in those patients who were sleepier during the day. In contrast to the numerous studies showing positive correlation, some investigations had reported no correlation between sleep disorders and psychiatric manifestations, as in a 5-year longitudinal study of Phillips *et al*. They did not find any significant anxiety and depression-like symptoms in elderly patients with a relatively mild OSA (AHI >5/h), when compared to a control group without OSA (AHI <5/h).[13] Our findings are similar to those of Macey *et al*.,[3] in which a strong association between OSA severity, AHI, and accompanying symptoms had not appeared. These studies suggest that mechanisms in addition to hypoxia and arousals occurring with apneas induce adverse health effects in OSA. The small sample size was the major limitation of the present study. Due to a particular area and the small sample size, the comprehensive study is warranted for generalization of the data for a larger population.

For understanding the link between OSA and depression, the patients with OSA must be screened for psychiatric features and patients of depression not responding to medical treatment or those with features such as snoring and EDS must be evaluated for OSA. Our data showed that OSA and psychiatric manifestations are not associated significantly.

Conclusion

Although OSA is associated with psychiatric manifestations, there is no significant correlation between EDS, BMI, AHI, oxygen saturation, and psychiatric features.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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