Clinical Profile Of Obstructive Sleep Apnea Syndrome (OSAS)

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Abstract :

Background : This study was undertaken to analyse the clinical profile of Obstructive Sleep Apnea Syndrome (OSAS), so as to facilitate early diagnosis of OSAS. Methodology : A retrospective study was conducted at pulmonary medicine department of tertiary care hospital. Data of 68 patients diagnosed as OSAS, was reviewed to study symptomatology, demography, various probability scores and co-morbidities associated with OSAS. **Results :** We observed male predominance in the male to female ratio of 1.95:1. Dominant age group we found in our study was 40-55 years, as 41.17% patients belonged to this age group. Total 88.23% patients had there neck circumferences > 37cm whereas 85.28% patients had BMI >25. With respect to mallampati score 94.1% patients had score >2. Epworth sleepiness scale was in favour of sleepiness in 76.46% patients. Of SACS, APNEIC and STOP-BANG scores, STOP-BANG was found to have statistical significance with OSAS as 92.64% patients had score >3. Most common co-morbidity observed was GERD 76.47%, followed by Hypertension 52.94% and Diabetes Mellitus 45.58%. Only 11.76% patients had moderate to severe pulmonary hypertension (PH), whereas 67.64% had mild PH and 20.58% didn't have any PH. **Conclusion :** Our study indicates symptomatology is most important indicator of OSAS and any patient having loud snoring and excessive daytime sleepiness should be subjected for polysomnography. However, owing to sparse availability of PSG and its cost pretest probability scores can play an important role to select patients for PSG. Also concomitant diagnosis and management of comorbidities are crucial for optimal treatment of OSAS. Also, an active case finding is necessary for females, as they always hide the symptoms to avoid social stigmata, which leads to serious consequences. **Keywords :** Sleep Apnea, OSA, OSAS, sleep disordered breathing

Introduction : Obstructive sleep apnea (OSA)is type of sleep-disordered breathing(SDB), characterised by recurrent episodes of upper airway collapse during sleep, leading to cessation or significant decrease in airflow in the presence of breathing effort.[1] When it is associated with excessive daytime sleepiness it is called as obstructive sleep apnea syndrome (OSAS). It is well known that OSA is associated with and can aggravate many medical illnesses such as systemic and pulmonary hypertension, cardiac arrhythmias, ischemic heart disease and stroke, as well as affecting psychosocial well-being.[2] Hence to increase awareness, so as to facilitate early diagnosis and treatment of OSAS we studied the clinical profile of OSAS.

Materials and Methods : A retrospective study was conducted at a tertiary care hospital. Data of 68 patients diagnosed at our hospital or diagnosed and referred to our hospital on the basis of history, probability scores and polysomnography was analysed after taking ethics committee approval. Various epidemiologic characters, symptomatology, probability scores, and polysomnographic parameters were analysed.

We included patients of all ages and of both the genders. Apnoea was considered as cessation of airflow for a minimum of 10 seconds while hypopnoea was considered in patients with at least 50% flow limitation with at least 3% desaturation. The AHI – Apnoea-hypopnoea index was the total number of Apnoea-hypopnoea incidents per

hour. AHI of more than or equals to 5 was taken as OSAS criteria. Patients were divided into three categories of mild, moderate and severe OSAS by using AHI scores of 5 – 14, 15 – 29 and more than or equals to 30 respectively.

Inclusion criteria :

1. Patients diagnosed on polysomnography
2. Patients of all ages and both the genders

Exclusion criteria :

1. Patients with upper airway abnormalities
2. Pregnant females

Sample size :

According to a study conducted by JK Kim et al, the prevalence of OSAS found was 3.85%,

So, So, p = 3.85%

Using formula for sample size (n) calculation,

$$n = \frac{4 \times p \times q}{e2}$$

Where, p = 3.85% = 0.0385

q = 1 - p = 0.9615

Taking e, absolute error of 5%, e = 0.05

So, $n = \frac{4 \times 0.0385 \times 0.9615}{0.05 \times 0.05}$

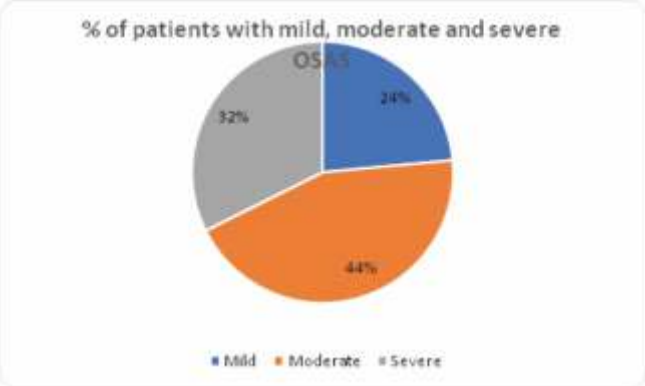
$n = 59.23 \approx 60$

A minimum of 60 patients is to be included in the study. We got a total of 68 patients matching the inclusion and exclusion criteria, we have analysed all those 68 cases. So,N = 68.

Statistical analysis : Data was entered in Microsoft Excel, and was analysed using EpiInfo version 7.2.1. Chi-square test was used for association.

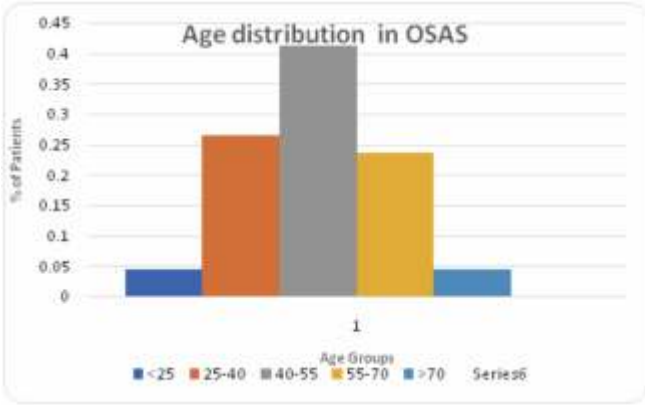
Results : Total of 68 patient with polysomnographic reports available were selected. All patients were diagnosed as OSAS with the help of full night polysomnography, and we observed 23.52% (16) patients had mild OSAS, 44.11% (30) patients were diagnosed as moderate OSAS and 32.35% (22) patients as severe OSAS (Figure 1).

Figure 1: % of patients with mild, moderate and severe OSAS.



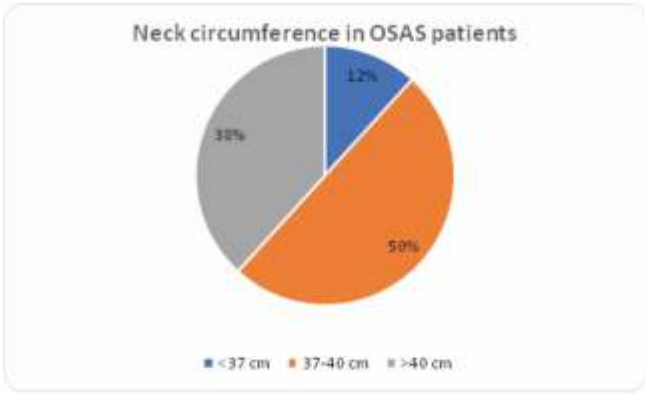
We found male predominance (66.17%) as compared to female (33.82%). Dominant age group was 40-55 years, the youngest was 8 years old and the eldest was 71 years (Figure 2) mean age of the study participants was 43.68 ± 13.47 years.

Figure 2: Age distribution in OSAS patients.



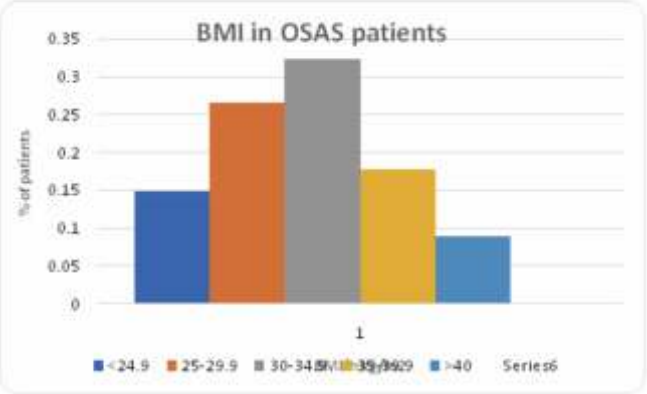
Only 11.76% (8) patients had neck circumference of <37 cm, whereas 50% (34) had between 37-50cm and 38.23% (26) had there neck circumference >40cm (figure 2) Mean Neck circumference was 38.35 ± 6.08 cm (Figure 3).

Figure 3 : Neck circumference in OSAS patients



Fifty percent patients were obese (BMI 30-39.9), 8.82% morbidly obese (BMI >40), 26.47% were over weight (BMI >25-29.9) mean BMI observed in participants was 31.80 ± 6.46 Kg/m2(Figure 4).

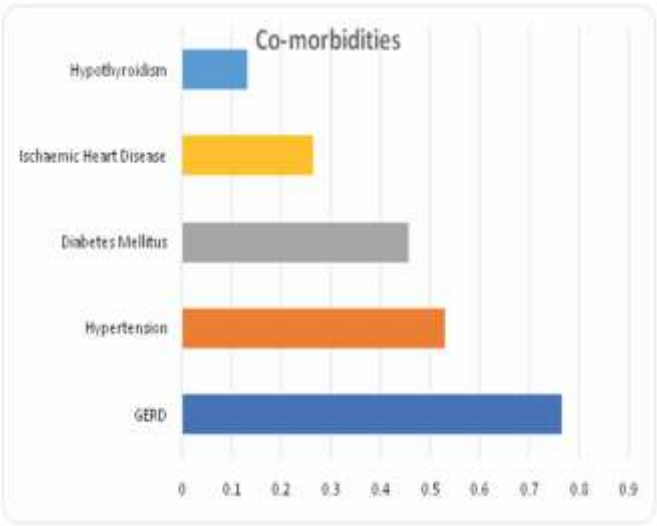
Figure 4: BMI in OSAS patients



With respect to mallampati class 94.12% patients had class >2. Epworth sleepiness score also calculated and in 76.46% patients it was >10. In 72.05% patients SACS score was >46 and in 27.94% patients it was<46. With respect to the STOP-BANG score we found best co-rrelation that 92.64% patients had score >3 whereas only 7.35% patient s had score <3. APNEIC score, 10.29% patients had score between 0 to 2, 52.94% between 3 to 4, 36.76% patients between 5 to 6. Though all these scores were correlating with OSAS, statistical significance was seen with STOP-BANG score >3 only(p <0.005).

As OSAS is associated with significant co-morbidities we also noted them and most common co-morbidity we found was GERD and least common was hypothyroidism (Figure 5).

Figure 5 : Co-morbidities associated with OSAS.



All our patients were subjected for 2D ECHO to check for pulmonary hypertension (PH) we found that most of the patients were having mild PH 67.64% whereas 8.82% had moderate PH, 2.94% patients had severe PH and 20.58% patients had no PH.

Although OSAS was seen more common in old age group, we could not find statistical significance between age group, gender and presence of OSAS (p > 0.05), while significant association was seen between higher neck circumference and BMI > 30 and presence of OSAS (p < 0.005).

Discussion : OSAS is common treatable condition which is associated with and may aggravate number of systemic and metabolic diseases.[2] OSAS is referred as cessation or significant decrease in airflow due to complete or partial collapse of upper airways, in the presence of breathing efforts. These episodes are associated with oxygen desaturation leading to sleep fragmentation and its hazardous effects on body.[3] Sleep-disordered breathing occurs in 24% of young-middle aged men and 9% of women and in 70% of older men and 56% of older women.[4,5] The male-to-female ratio is estimated between 3:1 to 5:1 in the general population.[6] It has been postulated that the higher clinical ratio may be a result of the fact that women do not show the "classic" symptomatology and thus may be under diagnosed. This may also be a result of the fact that women are more reluctant than men to complain of snoring. And another hypothesis is that men have more severe OSA and thus are more likely to be diagnosed by their primary care physician and then referred to a sleep medicine center. Concordance with this our study also showed male predominance with male to female ratio of 1.95.

Majority of patients fell into age group of 40 to 55 years with mean age of 47.5 years. This is again in correlation with national and international studies. This high incidence is may be due to decline in slow wave sleep with ageing.[7] Major symptoms associated with OSAS are loud snoring, excessive daytime sleepiness, nocturnal choking, witnessed apneas, irritability, morning headache, nocturia, insomnia, decreased libido.[8] Our study showed 100% prevalence of loud snoring followed by excessive daytime sleepiness 84.40% and we suggest any patients complaining of these two symptoms should be evaluated

for OSAS and if associated with other symptoms probability of OSAS further increases. Most important risk factor for OSAS is said to be obesity and several studies have shown that an increase in BMI and neck circumference is associated with increased incidence of OSAS.[9] Our study also had positive correlation with BMI and neck circumference as 85.23% patients had BMI > 25kg/m2 and 88.23% patients had there neck circumferences > 37cm. It is possible that obesity may worsen OSA because of fat deposition at specific sites. Fat deposition in the tissues surrounding the upper airway appears to result in a smaller lumen and increased collapsibility of the upper airway, predisposing to apnea.[9] Moreover, fat deposits around the thorax (truncal obesity) reduce chest compliance and functional residual capacity and may increase oxygen demand.[9] The Mallampatti Scoring System (MSS) was initially developed as a classification system of oro-pharyngeal opening and has been used to identify patients with potentially difficult intubation. Later it was found to be useful in OSA also. In our study 94.1% patients had there score > 2, and found to be one of the probability indicators after symptoms. As confirmation of OSAS requires full night Polysomnography, various pretest probability scores are available for prediction. We studied the significance of, STOP-BANG score, and APNEIC scores, Sleep Apnea Clinical Score (SACS). Epworth Sleepiness Scale (ESS)[10] is used to assess daytime sleepiness and we found 76.46% patients had score >10, that indicates probability of patient to fall asleep. Among SACS, STOP-BANG and APNEIC as pre-test probability scores, we found strong correlation between STOP-BANG and positive polysomnography, however we could not find any correlation between increasing scores and severity of OSAS. GERD is most common co-morbidity associated with OSAS and it is said to be related to obesity and sleep disturbance instead of OSA as causative factor.[11] In our study GERD was most common too inquiry of symptoms suggestive of GERD is must for optimal management. We also found 52.94% patients having systemic hypertension. The main acute physiological consequences of OSAS are intermittent hypoxia, intrapleural pressure changes, and arousals, which might induce endothelial dysfunction, sympathetic activation, lipid metabolism dysfunction, increased oxidative stress, etc. All of these consequences could increase the artery tone and arterial stiffness, and thereby increase the risk of systemic hypertension and further cardiovascular diseases such as stroke and atherosclerosis.[12] And in our study 26.47% patients were diagnosed as IHD. The development of pulmonary hypertension is a poor prognostic sign in patients with obstructive sleep apnea (OSA) and affects both mortality and quality of life. Although pulmonary hypertension in OSA is traditionally viewed as a result of apneas and intermittent hypoxia during sleep, recent studies indicate that neither of these factors correlates very well with pulmonary artery pressure.[13] In our study 11.76% patients had moderate to severe PH whereas 67.64% were having mild PH.

Conclusion : Our study indicates symptomatology is the most important indicator of OSAS and any patient having loud snoring and excessive daytime sleepiness should be subjected for polysomnography. However owing to sparse availability of PSG and its cost pre-test probability scores can play important role to select patients for PSG. Also concomitant diagnosis and management of comorbidities is crucial for optimal treatment of OSAS. Also active case finding is necessary for females, as they always hide the symptoms to avoid social stigmata, which leads to serious consequences.

References:

1. Guilleminault C, Tilkian A, Dement WC. The sleep apnea syndromes. Annu Rev Med. 1976. 27:465-84.
2. Wiegand L, Zwillich CW. Obstructive Sleep Apnea. Diseases-a-Month 1994; XL (4): 199-251.
3. Brixler. Obstructive sleep apnea. Ann Intern Med. 2005 Feb 1. 142(3):187-97.
4. Douglas Neil J. Clinician's Guide to Sleep Medicine. London: Hodder-Headline Group; 2002.
5. Ancoli-Israel S, Kripke DF, Klauber MR, Mason WJ, Fell R, Kaplan O. Sleep-disordered breathing in community dwelling elderly. Sleep. 1991; 14: 486–495.

6. Young T. The occurrence of sleep-disordered breathing among middle-aged adults. N Engl J Med. 1993;328:1230–1235.

7. Hudgel DW, Devadatta P, Hamilton H. Pattern of breathing and upper airway mechanics during wakefulness and sleep in healthy elderly humans. J Appl Physiol. 1993;74:2198–2204.

8. Spicuzza L, Caruso D, Di Maria G. Obstructive sleep apnoea syndrome and its management. Ther Adv Chronic Dis. 2015;6(5):273-85.

9. Romero-Corral A, Caples SM, Lopez-Jimenez F, Somers VK. Interactions between obesity and obstructive sleep apnea: implications for treatment. Chest. 2010;137(3):711-9.

10. Johns MW.A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. Sleep 1991; 14:540-5.

11. Basoglu OK, Vardar R, Tasbakan MS, Ucar ZZ, Ayik S, Kose T, Bor S. Obstructive sleep apnea syndrome and gastroesophageal reflux disease: the importance of obesity and gender. Sleep and Breathing. 2015 May 1;19(2):585-92.

12. Zhang W, Si LY. Obstructive sleep apnea syndrome (OSAS) and hypertension: pathogenic mechanisms and possible therapeutic approaches. Ups J Med Sci. 2012;117(4):370-82.

13. Kholdani C, Fares WH, Mohsenin V. Pulmonary hypertension in obstructive sleep apnea: is it clinically significant? A critical analysis of the association and pathophysiology. Pulm Circ. 2015;5(2):220-7.