



Risk Factors for Obstructive Sleep Apnoea

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ABSTRACT Obstructive Sleep Apnoea (OSA) is associated with excessive daytime sleepiness, increased risk of motor vehicle accidents, increased cardiovascular risk, neuropsychological impairment and increased impaired quality of life. Multiple risk factors are considered for association.

Aim: To study risk factors for the development of OSA and to understand the effects of age, sex, obesity, smoking, alcoholism and other comorbid conditions over normal sleep physiology.

Materials and Method: This is a cross sectional study of 30 patients carried out at Department of ENT and Head-Neck Surgery, B. J. Medical College and Civil Hospital, Ahmedabad. 30 patients of more than 20 years of age diagnosed to have AHI >5 by Polysomnography which are included in the study.

Result: In this study almost half of the patients were between 21 to 30 years of age. 21 patients were male and 9 were female. 10 patients were having hypertension and 2 had hypothyroidism. 6 patients had a habit of smoking and 2 patients had tobacco chewing habit. 15 patients were having overweight and 5 patients were obese.

Conclusion: OSA affects middle and older aged men and we can call it a disease of upper class as almost always it is associated with the obesity. India is a country with high prevalence of smokers, alcoholics and tobacco chewers which further increases chances to have an obstructive sleep apnoea to that person.

KEYWORDS :

Introduction

Obstructive Sleep Apnoea (OSA) is a common condition which is associated with excessive daytime sleepiness, increased risk of motor vehicle accidents, increased cardiovascular risk, neuropsychological impairment and increased impaired quality of life.¹²

According to American Academy of Sleep Medicine, Obstructive Sleep Apnoea Syndrome (OSAS) is characterized by recurrent episodes of partial or complete upper airway obstructions during sleep.³ This manifests as a reduction (hypopnoea) or complete cessation (apnoea) of airflow despite ongoing inspiratory efforts resulting in oxygen desaturations and arousals.

As the muscle tone of the body ordinarily relaxes during sleep and the airway at the throat is composed of walls of soft tissue, which can collapse, it is not surprising that breathing can be obstructed during sleep. This can be the result of an upper respiratory infection that causes nasal congestion, along with swelling of the throat, or tonsillitis that temporarily produces enlarged tonsils. Temporary spells of OSA syndrome may also occur in individuals who are under the influence of a drug (such as alcohol) that may relax their body tone excessively and interfere with normal arousal from sleep mechanisms.

Aim

To study risk factors for the development of OSA and to understand the effects of age, sex, obesity, smoking, alcoholism and other comorbid conditions over normal sleep physiology

Materials & Methods

This is a cross sectional study of 30 patients carried out at Department of ENT and Head-Neck Surgery, B. J. Medical College and Civil Hospital, Ahmedabad. Among the all symptomatically suspected cases of sleep apnoea, 30 patients diagnosed to have AHI >5 by Polysomnography which are included in the study.

All the patients included in the study were explained about the purpose and use of the study and after their consent only they were included in the study. All the patients were evaluated in ENT OPD pre-operatively for history, general examination and ENT examination. Overnight polysomnography was done in all suspected cases of OSA by pulmonologist. Patients who had AHI >5 were investigated for routine blood and radiological examination if indicated.

All the OSA patients are reviewed for their Age, Sex, obesity, smoking, alcoholism and other comorbid conditions.

Inclusion Criteria

All the patients of above 20 years of age having clinical features of OSA with obvious anatomical upper airway obstruction in DISE (Drug Induced Sleep Endoscopy) like turbinate hypertrophy, adenoid hyperplasia, tonsillar enlargement, BOT hyperplasia, long and redundant soft palate with AHI >5 are included in this study and considered for coblation assisted surgeries depending on site of obstruction.

Exclusion Criteria

All the patients having clinical features of OSA without obvious anatomical upper airway obstruction in DISE independent of AHI are excluded from this study.

Result

Table 1 shows distribution of the patient according to their age. In this study almost half of the patients were between 21 to 30 years of age. 2 patients were below 20 years of age. 9 patients were between 31 to 40 years of age. 4 patients were between 41 to 50 years of age and 1 patient was between 51 to 60 years of age.

TABLE 1: AGE WISE DISTRIBUTION OF CASES

Age group (years)	No. Patients (out of 30)	Percentage (%)
0-10	0	0
11-20	2	6.66
21-30	14	46.66
31-40	9	30
41-50	4	13.33
51-60	1	3.33
Total	30	100

In this study 21 patients were male and 9 were female. Table 2 shows number of male patients was double than female patient.

TABLE 2: SEX WISE DISTRIBUTION OF CASES

Sex	No. Patients (out of 30)	Percentage (%)
Male	21	70
Female	9	30
Total	30	100

11 patients had significant positive past history shown in table 3. 10 patients were having hypertension and all were on treatment and controlled. 2 patients were known case of hypothyroidism and both

were on treatment. Thyroid function test was within normal limit for both of the patients.

TABLE 3: Significant associated history

Other significant History	No. Patients (out of 30)	Percentage (%)
Hypertension	10	33.33
Hypothyroidism	2	6.66

Table 4 shows 6 patients had a habit of smoking. Out of these 6, 5 patients were on cigarette smoking and 1 patient was on bidi smoking. 2 patients had tobacco chewing habit.

TABLE 4: Personal history - Addiction

Addiction	No. Patients (out of 30)	Percentage (%)
Smoking	6	13.33
Tobacco chewing	2	6.66

BMI calculation was done by dividing 'Weight in kilogram by Square of Height in meter'. Standardization of BMI values above 20 years of age patients are done as per shown in **table 5**. In this study total 10 patients were having normal or healthy weight. 15 patients were having overweight and 5 patients were obese.

TABLE 5: BMI of age above 20 years

BMI	No. Patients (out of 30)	Percentage (%)
<18.5(Underweight)	0	0
18.5-25(Normal)	10	33.33
25-30(Overweight)	15	50
>30(Obese)	5	16.67

Discussion

Age

OSA's prevalence increases between middle and older age. With advancing age, sleep-related difficulties become increasingly common and often manifest as subjective complaints of difficulty falling asleep, the number and duration of night-time awakenings, and the amount of night-time sleep obtained.^{4,5} Mechanisms proposed for the increased prevalence of sleep apnoea in the elderly include increased deposition of fat in the parapharyngeal area, lengthening of the soft palate, and changes in body structures surrounding the pharynx.⁶ In this study almost half of the patients were between 21 to 30 years of age. 2 patients were below 20 years of age. 9 patients were between 31 to 40 years of age. 4 patients were between 41 to 50 years of age and 1 patient was between 51 to 60 years of age (Table 1).

Sex

Men have greater vulnerability than women toward developing OSA. In this study 21 (70%) patients were male and female patients were 9 (30%) (Table 2). Clinical studies have shown that, the ratio of men to women is in the range from 5 to 8:1.⁷ The male predisposition for the disorder has been attributed to sex differences in anatomical and functional properties of the upper airway and in the ventilatory response to arousals from sleep. Hormonal influences are also likely to have an important role in pathogenesis of obstructive sleep apnea, as disease prevalence is higher in post- versus pre-menopausal women.^{8,2} Furthermore, hormone replacement therapy in post-menopausal women has been associated with a lower prevalence in epidemiologic studies.⁸

Comorbidities

Besides the unfavorable effects on daytime sleep tendency and cognitive performance, obstructive sleep apnea also has been implicated in the etiology of cardiovascular conditions, including hypertension, coronary artery disease, congestive heart failure, and stroke. Out of 30 cases 12 patients had significant positive past history. 10 patients were having hypertension (Table 3).

Out of 30 patients, 2 patients were known case of hypothyroidism. Cross-sectional studies suggest that obstructive sleep apnea may be more prevalent in patients with hypothyroidism.⁹ Whether the occurrence of obstructive sleep apnea is directly caused by decrease in thyroidal hormones or whether it is due to confounding factors (e.g., obesity) that are common in hypothyroidism remains controversial. Hypothyroidism leads to widespread accumulation of hyaluronic acid in the skin and subcutaneous tissues, which gives rise to myxedematous appearance in these patients. Such deposition of

mucoproteins in the upper airway causes enlargement of the tongue and the pharyngeal and laryngeal mucous membranes, thereby increasing the propensity for upper airway collapse during sleep.¹⁰

Personal history

6 patients out of 30 were smoker from which 5 patients were on cigarette smoking & 1 patient was bidi smoker. 1 patient was a tobacco chewer (Table 4). Smoking is associated with a higher prevalence of snoring and sleep-disordered breathing.¹¹ In Wisconsin sleep cohort study, current smokers had a much greater risk of moderate or worse degree of OSA (odds ratio, 4.44) compared with never smokers.¹² It can well be explained by the cigarette induced airway inflammation and damage which could change the structural and functional properties of the upper airway, and increasing the risk of collapsibility during sleep. Alcohol relaxes upper airway dilator muscles, increases upper airway resistance and may induce OSA in susceptible subjects. The use of tobacco before going to bed can affect sleep. The nicotine in tobacco is a stimulant and can keep patient awake.

BMI

Central obesity has been associated with reduction in lung volume, which leads to a loss of caudal traction on the upper airway and hence, an increase in pharyngeal collapsibility.¹³ In this study total 12 patients were having normal or healthy weight. 13 patients were having overweight & 5 patients were obese (Table 5).

A number of previous epidemiological studies have investigated the associations between sleep apnoea and obesity. In a community-based cohort of middle-aged Caucasian subjects, a 1-SD increase in body mass index was associated with a four-fold rise in the prevalence of sleep apnoea and 40% of subjects from the community with OSA were moderately overweight but otherwise healthy.¹⁴

Conclusion

Obstructive sleep apnoea (OSA) is a type of breathing sleep disorder characterized by excessive snoring, day time sleeping, fatigue and disturbed sleep. It is an independent risk factor for hypertension, diabetes mellitus, cardiovascular diseases and stroke, leading to increased cardio-metabolic morbidity and mortality.

- This condition usually affects middle and older aged men and we can call it a disease of upper class as almost always it is associated with the obesity.
- India is a country with high prevalence of smokers, alcoholics and tobacco chewers which further increases chances to have an obstructive sleep apnoea to that person.
- Patients with hypothyroidism may have increased susceptibility for obstructive sleep apnea due to the combined effects of mechanical abnormalities and/or suppressed central respiratory control output.

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