

## "Prevalence of Obstructive Sleep Apnea in Copd Patients"

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### Abstract

**BACKGROUND-** COPD is a currently global epidemic having prevalence of around 10% in community after 40 years of age (15.8% in male, 5.5% in female). It has got 5% of total doctor consultation and 13% of all hospital admission, becoming the third major cause of death in the western country. OSA is a type of sleep-disordered breathing and shows complete or incomplete intermittent collapse of the upper airway leading to hypoxemia in sleep and repeated awakening during sleep. Studies have shown high prevalence of around 26% of COPD patients having OSA (apnea-hypopnea index [AHI]>5/h).

**MATERIAL AND METHOD-** Patient having clinical sign and symptoms suggestive of COPD visiting NMCH, Jamuhar got enrolled in study. Post bronchodilator FEV1/FVC<0.07 along with clinical symptoms was required to confirm the diagnosis COPD. After diagnosis of COPD each patient enrolled in study had an overnight full sleep study (polysomnography). OSA was defined by apnea-hypopnea index [AHI]>5/hr.

**RESULTS-** 107 patients (M-65 & F-42) who completed study 22 patients (M-17 & F-5) had OSA. Mean age of both group was more or less similar. Bur neck circumference and body mass index mean value were high in patients of COPD with OSA as compared to patients of COPD without OSA.

**CONCLUSION-** Prevalence of OSA in COPD in this study came out to be 20.56%, whereas in female 11.90% and in male 26.15%. There is no relation between FEV1 value of COPD and OSA severity.

**Keywords:** Obstructive Sleep Apnea, Disordered sleep breathing; Chronic obstructive pulmonary disease,

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**Abbreviation-** FEV1-Forced expiratory volume in one second. FVC- Forced vital capacity. COPD- Chronic obstructive pulmonary disease, OSA- Obstructive Sleep Apnea, PSG- polysomnogram

### I. Introduction

Chronic Obstructive Pulmonary Disease, is a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases (GOLD update 2014).

COPD is a currently global epidemic having prevalence of around 10% in community after 40 years of age. COPD leads to around 5% of doctor consultation and 13% of all hospital admission in total, becoming the third major cause of death in the western country<sup>(1-5)</sup>. In another study, COPD prevalence was around 15.8% in male whereas prevalence was around 5.5% in female.<sup>(6)</sup>

OSA is a type of sleep-disordered breathing which was explained many time ago itself<sup>(7)</sup> and shows complete or incomplete intermittent collapse of the upper airway leading to hypoxemia in sleep and repeated awakening during sleep<sup>(8)</sup>. Studies have shown high prevalence of around 26% of COPD patients having OSA (apnea-hypopnea index [AHI]>5/h)<sup>(9)</sup>. Prevalence of OSA increases with age, probably similar to COPD<sup>(1,10,11)</sup>.

Both COPD and OSA symptoms develop over time very very slowly, so it is easily missed usually. OSA in patients with COPD got poor effects on cardio vascular system of patients even if patients do not have complain of fall into sleep during daytime<sup>(12-14)</sup>. Therefore, knowing the prevalence of OSA in patients with COPD in our setting is much required.

### II. Aims And Objectives

1. To find the prevalence of OSA in COPD patients.
2. To find out relation between OSA severity and FEV1 value of COPD.

### III. Materials And Methods

**Study duration-** September 2018 to July 2019.

**Inclusion criteria-** Cases of COPD of age 40 to 80 years

**Exclusion criteria-**

1. Presence of HIV.
2. Past history of pulmonary TB
3. Patients with chronic lung disease (ILD).
4. Patients having cardiac diseases.

Patient having clinical sign and symptoms suggestive of COPD visiting NMCH, Jamuhar were enrolled in our study . A written informed consent was taken from each patients. A detailed clinical history and past history for anti-tuberculosis therapy was inquired in every Patient. All patients got chest radiography done . Spirometry was done in each patients for diagnosis of COPD . Post bronchodilator FEV1/FVC<0.07 along with clinical symptoms was required to confirms the diagnosis COPD. After diagnosis of COPD each patient enrolled in study had an overnight full sleep study (polysomnography).

Diagnosis of Obstructive Sleep Apnea was done from overnight full sleep study (polysomnography) report only. OSA was defined in this study by having , apnea-hypopnea index [AHI]>5/h.

### IV. Result

This was a prospective, observational study. Total 115 patients enrolled in our study out of which 8 patients could not complete the study thus they were excluded from study. Remaining 107 patients completed the study. Out of 107 patients (M-65 & F-42) who completed study, 22 patients (M-17 & F-5) were diagnosed with OSA on overnight full sleep study (polysomnography).

Mean age of COPD with OSA patients was 63.14 year while mean age of COPD without OSA patients was 62.06 year. Mean BMI of COPD with OSA patients was 29.72 kg/m<sup>2</sup> and mean BMI of COPD without OSA patients was 24.92 kg/m<sup>2</sup>. Mean FEV1 of COPD with OSA patients was 43.02 %, and mean FEV1 of COPD without OSA patients was 40.76%. Mean neck circumference of COPD with OSA patients was 41.73 cm and mean neck circumference of COPD without OSA patients was 36.50 cm.

PARAMETERS	COPD with OSA(22)	COPD without OSA(85)
AGE ( year, mean)	63.14	62.06
SEX (M/F)	17/5	48/37
BMI ( kg/m <sup>2</sup> , mean )	29.72	24.92
FEV1 (% of predicted value mean)	43.02	40.76
Neck circumference(cm, mean)	41.37	36.05
AHI, (events/hr, mean)	27.08	2.04

**Table-1:** M-male, F-female, cm-centimeter, hr-hour, m<sup>2</sup>-meter-square

### V. Discussion

Flenley called presence of both OSA and COPD as overlap syndrome <sup>(15)</sup> . Only on basis of clinical symptoms and signs it is difficult to diagnose OSA in chronic obstructive pulmonary disease patients so we should get an objective test like overnight full sleep study (polysomnography) done in every case. Prevalence of Obstructive Sleep Apnea in chronic obstructive pulmonary disease in our study came out to be 20.56% which is similar to study done by Peppard PE et al <sup>(9)</sup> .It is well known fact that prevalence of OSA increases with age. A whole together of pathology can be the cause of existing together of OSA and COPD. Body weight was high in OSA patients as compared in patients not having OSA , other studies show similar finding. <sup>(9)</sup> There is no relation between FEV1 value of chronic obstructive pulmonary disease and Obstructive Sleep Apnea severity.

Our study have certain limitations. First, this is a medical college based study and so there can be referral bias involved in patient selection. Second, exclusion criteria were applied to enroll patients in our study, which may not be always similar in day to day practice.

### VI. Conclusion

Prevalence of Obstructive Sleep Apnea in chronic obstructive pulmonary disease in our study came out to be 20.56%. Whereas prevalence of OSA in female patients is 11.90% and in male patients is 26.15%. There is no relation between FEV1 value of chronic obstructive pulmonary disease and prevalence of Obstructive Sleep Apnea . As Obstructive Sleep Apnea carries poor prognosis in chronic obstructive pulmonary disease it must be evaluated in each patients of COPD.

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