

Relationship between Quality of Sleep and Depression in Patient of Chronic Obstructive Pulmonary Diseases

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Abstract: Chronic obstructive pulmonary disease (COPD) is a highly prevalent disease worldwide that has significant extra pulmonary effects that may impact the severity of symptoms in individual patients. Depression & disturbance of sleep are common and important co morbidities in patients of COPD cause impairment in health related status. Which were positively associated with psychological distress, as indicated by symptoms of depression & disturbance of sleep and level of daily functioning³, and overall impairment in quality of life⁴. Relationship between Quality of Sleep And Depression In Patient Of Chronic Obstructive Pulmonary Diseases. This prospective cross sectional hospital based study was carried on COPD patients of Respiratory medicine & Institute of Respiratory Disease, SMS Medical College, Jaipur, Rajasthan. During the year between 2015 to 2017 after applying specific selection and exclusion criteria. Sample size is calculated at 95% confidence interval, alpha error 0.05 assuming 42% of COPD patients having significance depression as per seed article. Quality of sleep showed significant association with the depression as well as Anxiety. Out of 74% patient with poor quality of sleep 85% patient had depression and out of 26 patients with good quality sleep 53.8 % had depression. Depression and sleep problems may aggravate the symptoms and intensify the effects of COPD on health status in all stages of disease severity, leading to findings of more impairment in health status as well as reduced quality of life. Depression significantly associated with sleep disturbance & depression (p-0.001) and in higher age group. Both psychological distress and sleep problems may aggravate the symptoms and intensify the effects of COPD on health status in all stages of disease severity. Thus, management of COPD should also address the management of these co morbidities.

Keywords: COPD, depression.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a chronic lung disease that has significant extra pulmonary effects that may impact the severity of symptoms in individual patients. COPD is a highly prevalent disease worldwide. The prevalence is variable between countries, but overall there is a prevalence rate of around 10% in individuals aged 40 and above¹. In developed countries, COPD is responsible for approximately 4% of all deaths and is the only major condition for which the burden of disease continues to increase, currently being 5th overall in underlying cause of death and 3rd for burden of disease [2].

Depression & disturbance of sleep are common and important co morbidities in patients of

COPD. The pathophysiology of these psychological co morbidities in COPD is complex and possibly explained by common risk factors, response to symptomatology and biochemical alterations. There is currently no consensus on the most appropriate approach to screening for depression & disturbance of sleep in COPD.

COPD patients with co-morbid depression & disturbance of sleep cause impairment in health related status. This Impaired health status was however positively associated with psychological distress, as indicated by symptoms of depression & disturbance of sleep and level of daily functioning³. Prevalence of sleep disturbance in COPD patients are high and it causes nonspecific daytime symptoms of chronic fatigue, lethargy and overall impairment in quality of

life⁴. Polysomnographic recordings of COPD patients had demonstrated low total sleep time, frequent arousals and awakenings, reduced amounts of slow wave and rapid eye movement (REM) sleep. Poor sleep quality in COPD patients are considered as consequence of multiple contributing factors e.g., higher age, severity of COPD, concomitant medications, underlying depression and any underlying sleep related breathing disorders⁵. Thus, adequate diagnosis and management of sleep abnormalities in COPD patients can improve their overall sense of well be.

Keywords: COPD, Depression, Disturbance of Sleep.

AIMS & OBJECTIVES

Primary Objective

Relationship between Quality of Sleep and Depression in Patient of Chronic Obstructive Pulmonary Diseases

MATERIALS & METHODS

Study Design & approval

This prospective cross sectional hospital based study was carried out on consecutive clinically stable COPD patients during their outpatient and inpatient department visit at Department of Respiratory medicine & Institute of Respiratory Disease, SMS Medical College, Jaipur, Rajasthan. During the year between 2015 to 2017.

Sample Size

Sample size is calculated at 95% confidence interval, alpha error 0.05 assuming 42% of COPD patients having significance depression as per seed article. At 10% absolute allowable error 97 COPD case

was required in this study, which was further rounded about 100 cases.

Inclusion criteria

- Ex or current smoker with post bronchodilator FEV₁/FVC<0.70 and FEV₁ fails to increase absolute volume >200 ml and 12% after 200 microgram of salbutamol inhalation.
- Patients willing to participate in the study and giving an informed written consent.

Exclusion criteria

- Acute exacerbation of COPD in 4 weeks prior
- History of taking anti-depressant or anti-anxiety drug
- History of any neuropsychiatric illness
- Chronic systemic illness

Study protocol

This study was approved by Institutional Review Board, SMS Medical College, and Jaipur. After giving full explanation regarding the study, written consent was obtained from all enrolled patients.

Spirometry with reversibility testing was performed using RMS software and According to GOLD guidelines patients were classified as mild, moderate, severe, very severe COPD.

GOLD classification of COPD on the basis of post bronchodilator FEV₁

Classification of severity of airflow limitation in COPD[1].

OBSERVATIONS & RESULTS

Table-1: Total no. of COPD patients according to severity (In patients with FEV₁/FVC<0.70)

Stage of COPD			Patients.
GOLD I	stage I (FEV ₁ %≥80)	MILD	0
GOLD II	stage II (50%≤FEV ₁ %<80)	MODERATE	67
GOLD III	stage III (30≤FEV ₁ %<30-49)	SEVERE	32
GOLD IV	stage IV (FEV ₁ %<30)	VERY SEVERE	1

There were 67 patients (30%) in stage II, 32 patients (47.5%) were in stage III and 1 patient (22.5%) in stage IV.

In all patients severity of COPD was classified, depending on the post bronchodilator FEV₁

value as per global initiative for chronic obstructive lung disease (GOLD) recommendation i.e., stage I (FEV₁ %≥80), stage II (50%≤FEV₁ %<80), stage III (30≤FEV₁ %<30-49) and stage IV (FEV₁ %<30).¹

Table-2: Association of the Age with Depression

Age (Years)	No depression	Mild depression	Moderate depression	Moderately Severe	Total	P Value
	PHQ 1-4 (23)	PHQ 5-9(36)	PHQ 10-14(28)	PHQ 15-19(13)		
<60	12(52.2%)	22(61.1%)	9(32.1%)	4(30.8%)	47(47%)	0.07
>60	11(47.8%)	14(38.9%)	19(67.9%)	9(69.2%)	53(53%)	
Total	23(100%)	36(100%)	28(100%)	13(100%)	100(100%)	

Table-3: Association of severity of COPD with depression

FEV 1	No depression	Mild depression	Moderate	Moderately Severe	Total	P Value
	PHQ 1-4 (23)	PHQ 5-9(36)	PHQ 10-14(28)	PHQ 15-19(13)		
49-30	6(26.1%)	14(38.9%)	8(28.6%)	4(30.4%)	32(32%)	
< 30	0(0)	1(2.8%)	0(0)	0(0)	1(1%)	
Total	23(100%)	36 (100%)	28(100%)	13 (100%)	100(100%)	

Table-4: Subjective quality of sleep in COPD patients according to PSQI scale

Grading of sleep	Patients
Good quality sleep(0-5)	26
Poor quality sleep(> 5)	74

Out of 100 patients only 74% patients found to have sleep disturbance or poor quality of sleep, median PSQI global scores of study population was 8.

The median time to fall asleep and median hours of sleep of study population was 20 minutes and 5 hours, respectively.

Table-5: Relationship B/W Quality of Sleep and Depression

	Poor quality Sleep PSQI >5 (74)	Good quality Sleep PSQI 0-5 (26)	Total	P Value
Depression (PHQ>5)	63(85.1 %)	14 (53.8%)	77%	0.001
No depression (PHQ0-4)	11(14.9%)	12 (46.2 %)	23%	
Total	74 (100%)	26 (100%)	100 %	

Amongst 74% patients who had sleep disturbance (PQSI>5), 63(85.1%) had depression and 11(14.9%) found without depression. While out of 26% patients with good quality of sleep 14(53.8) had depression and 12(46.2%) had no features of depression. This association of quality of sleep with depression is significant with p value .0.001

DISCUSSION

In this prospective study, the age of patient ranged between 53 to 78 years, with a mean age of 61.9± 9.29 with was similar to another study done by sajal de *et al.*[5] with mean age of 62.2 years. This showed that COPD is a disease of old age.

All COPD patients were classified as per global initiative for chronic obstructive lung disease (GOLD) recommendation based on post bronchodilator FEV1 value. Maximum patient were in stage II COPD (67%), 32% patients were in stage III COPD, and no patient were having severe COPD. In a study sajal de *et al.* 47.5% patient were in stage III COPD. Average value of post bronchodilator FEV1 in our study was 57.07 ± 12.02 which was very high compared to other study.

In our study sleep disturbance was seen in 74 COPD patient It was assessed with the help of PSQI global scale, median value of PSQI was 7.99± was

3.83 (0-18). In a study by sajal *et al.*[5], sleep disturbance was seen in all 100 patients, with median PSQI value of 11 which was high comparative to our study. Lewis *et al.* found 61% patient had poor quality sleep with (PSQI >5). Nenes *et al.*[4] observed 75% of COPD patient had poor quality sleep.

Quality of sleep was assessed with various factors which can affect sleep disturbance. But it was not to found to be associated with any of factors ie. Age, smoking, living status and employment status. Sleep disturbance was also not associated with severity of COPD (P value <0.05), some other study done by seharf *et al.* [6] & bellia *et al.* [7] also failed to demonstrate this relationship between sleep disturbance and severity of COPD [5].

Quality of sleep showed significant association with the depression as well as Anxiety. Out of 74% patient with poor quality of sleep 85% patient had depression and out of 26 patients with good quality sleep 53.8 % had depression.

Higher Prevalence of sleep disturbance in COPD patients causes nonspecific daytime symptoms of chronic fatigue, lethargy and overall impairment in quality of life which was also present in our cases. Study by sajal de *et al.* [5]. Also found a significant association between quality of sleep and depression.

This study result showed that sleep disturbance is commonly presenting health related Indices in COPD patients, which effect health status of the patient. It was significantly seen in association with depressions. Depression and sleep problems may aggravate the symptoms and intensify the effects of COPD on health status in all stages of disease severity, leading to findings of more impairment in health status as well as reduced quality of life. Poor health status as a consequence of the multiple structural and functional effects of COPD, not captured solely by the expiratory airflow limitation, may cause psychological distress and sleep disturbance.

CONCLUSION

Anxiety and depression is major co-morbidities in COPD patients & according to this study Prevalence of depression was 77%.

Depression significantly associated with sleep disturbance (p-0.001 for depression).

Sleep disturbance significantly correlated with depression and in higher age group. Both psychological distress and sleep problems may aggravate the symptoms and intensify the effects of COPD on health status in all stages of disease severity, thus, management of COPD should also address the management of these co morbidities.

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