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Depressive Disorders among Patients in Chronic Obstructive Pulmonary Disease

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Abstract **Original Research Article**

***Background*:** COPD patients suffer from limitations of activities, loss of independence, decreased social functioning and quality of life. Commonly associated co-morbid conditions include cardiovascular disease, the metabolic syndrome, osteoporosis, depression, lung and other cancer. ***Objective*:** To evaluate depressive disorders in chronic obstructive pulmonary disease (COPD) patients. ***Material and Methods*:** This study was a cross sectional and comparative study conducted in the department of Psychiatry in collaboration with the department of respiratory medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh during the period from July 2014 to June 2015 with a view to evaluate depressive disorders among patients in COPD. For this purpose 96 respondents of COPD patients were selected fulfilling the inclusion and exclusion criteria and categorized as COPD group (group-A). ***Results*:** Depressive disorders were present in 39 (42.9%) patients of smoker and 2 (40.0%) patients of non-smoker. Depressive disorders were present in 17 (50.0%) patients on steroid and 24 (38.7%) patients not on steroid. Though steroid intake increased the rate of depressive disorders in COPD but did not reach the level of significance. The rate of depressive disorders increased with duration of COPD but did not reach the level of significance (χ^2=2.931; p=0.231). ***Conclusion*:** A liaison between medicine and psychiatry practice is essential for early detection and treatment of depression in patients suffering from COPD.

Keywords: Chronic obstructive pulmonary disease, metabolic syndrome, morbidities depression.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a preventable and treatable disease characterized by persistent airflow limitation that is usually progressive. It is commonly associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. The prevalence of COPD directly related to the prevalence of tobacco smoking and the use of biomass fuels, more common in low and middle income countries. Current estimate suggest that 80 million people worldwide suffer from moderate to severe stage of COPD [1].

Chronic obstructive pulmonary disease (COPD) is a chronic illness and is a major cause of morbidity and mortality worldwide [2]. By 2030 COPD has been predicted 3rd leading cause of death and 5th leading cause of disability in the world [3, 4]. The overall prevalence of COPD is 4.32% in general population in Bangladesh [5].

Among psychiatric morbidities depression is the most common complication in COPD patient. The prevalence of depressive symptoms among COPD patients has been estimated to be 40 to 50% [6]. Depression is the 1st leading cause of disability worldwide [3]. Most often depression is unexplored in a patient due to variations of clinical presentation [7].

The Medical Outcomes Study suggested that patients with chronic respiratory disease (next only to patients with chronic gastro-intestinal disease) appeared worst off on their mental health status than patients with all other chronic diseases [8].

Unrecognized and untreated depressions is associated with poor treatment compliance, increased

frequency of consultation, hospital admission, hospital stay, treatment cost and increased overall health care burden to the health care services [9]. Risk of dropout from pulmonary rehabilitation is significantly greater in depressed COPD patients, irrespective of severity of breathlessness [10].

Due to the irreversible nature of chronic obstructive pulmonary disease (COPD), the aim of treatment in patients with COPD is not to cure but to reduce symptoms, increase functioning and improve the patient's quality of life. Along with the disease process itself, attention should given to co-morbid depression in CODP patient.

OBJECTIVE

General Objective

- To evaluate depressive disorders in chronic obstructive pulmonary disease (COPD) patients.

Specific Objective

- To determine depressive disorders among patients with chronic obstructive pulmonary disease and healthy subjects.
- To compare depressive disorders between chronic obstructive pulmonary disease patients and healthy subjects.
- To delineate socio-demographic profile of chronic obstructive pulmonary disease patients and healthy subjects**.**

METHOD

Study design: This was a cross sectional comparative study.

Place of Study: This study was carried out in the Department of Psychiatry in collaboration with the Department of Respiratory Medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet.

Study Period: This study was conducted from 1st July 2014 to 30th June 2015.

Study population: All COPD patients those got admitted in the different unit of Medicine and Respiratory Medicine fulfilling inclusion and exclusion criteria were taken as case. Control subjects were age and sex matched accompanying person of the patients or other patients attending Sylhet M.A.G. Osmani Medical College Hospital, Sylhet during the study period from 1st July 2014 to 30th June 2015 were the study population.

Inclusion Criteria:

1. Presence of COPD was confirmed by spirometry, diagnosis was reviewed by chest specialist.
2. Irrespective of age and sex.
3. Control subjects were healthy age and sex matched accompanying person of the COPD patients or other patients.

Exclusion Criteria

4. Patients with other medical co-morbidities.
5. Patients with known psychiatric disorder.

Sample Size: 96 sample

Sampling Technique: consecutive convenient sampling technique was applied during selection of sample.

Data Collection Procedure:

Informed written consent was obtained from the patients after full explanation of purpose of the study. They also informed that they have right to withdraw from the study at any stage.

After fulfilling the inclusion and exclusion criteria 96 patients of COPD (based on clinical history, examination and lung function test spirometry and confirmed by chest specialist) were selected in this study as study subjects (Group-A). Age and sex matched 96 healthy subjects examined by chest specialist who were fulfilling the inclusion and exclusion criteria selected as control subjects (group-B).

Statistical Analysis

All data were recorded systematically in a preformed check list. Quantitative data were summarized as mean and standard deviation; and comparison was performed between the two groups by unpaired t test. Qualitative data were summarized as frequency and percentages. Comparison between two groups was done by chi-square (χ^2) test and Fisher's Exact test. A probability (p) value of, <0.05 was considered statistically significant and p>0.05 was taken as non-significant. Statistical analysis was performed by using SPSS (Statistical package for social science) for windows version 21.

RESULT

This study was a cross sectional and comparative study conducted in the department of Psychiatry in collaboration with the department of respiratory medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh during the period from July 2014 to June 2015 with a view to evaluate depressive disorders among patients in COPD.

Figure-1 showed the distribution of the patients of COPD according to steroid use. Use of steroid in 34 (35.4%) patients and 62 (64.6%) patients did not use any steroid.

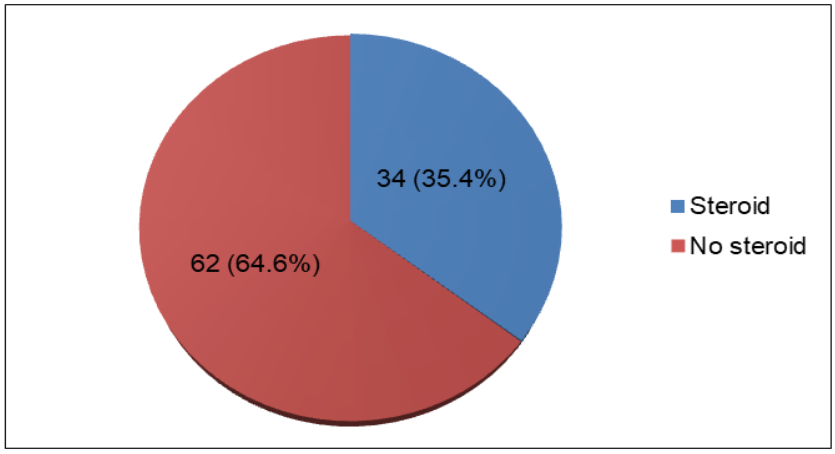

Figure-1: Distribution of the patients of COPD according to steroid use (n=96)

Figure-2 showed the distribution of respondents according to duration of COPD. Duration of COPD was 1 to 5 years in 27 (28.1%) cases, 6 to 10 years in 40 (41.7%) cases and above 10 years in 29 (30.2%) cases.

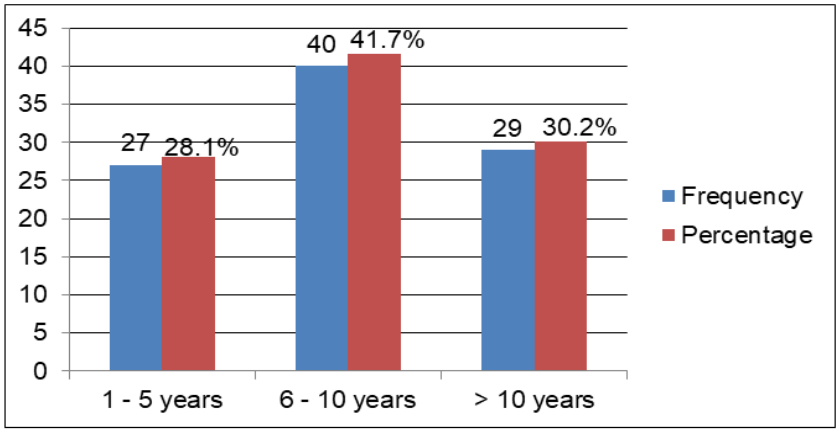

Figure-2: Distribution of respondents according to duration of COPD (n=96)

Figure-3 showed the distribution of the patients by severity of COPD according to GOLD criteria. GOLD stage-III was the most frequent severity of COPD constituted 47.9% of cases, followed by stage-IV (45.8%) and stage –II (6.2%).

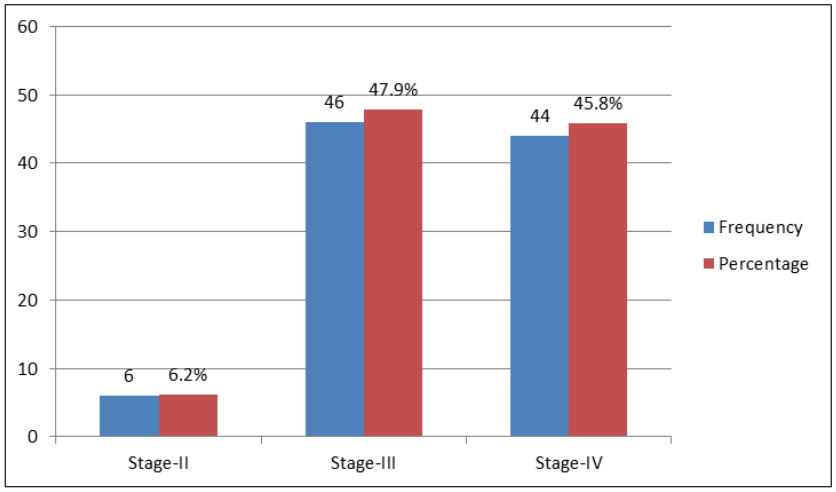

Figure-3: Distribution of the patients by severity of COPD according to GOLD criteria (n=96)

Depressive disorders were present in 39 (42.9%) patients of smoker and 2 (40.0%) patients of non-smoker. Smoking status did not affect the depressive disorders in COPD (p=1.000). Association of smoking and depressive disorders in COPD was shown in Table-I.

Table-I: Association of smoking and depressive disorders in COPD

Smoking status	Depressive disorders		p-value
	Present Frequency (%)	Absent Frequency (%)	
Smoker (n=91)	39 (42.9)	52 (57.1)	*p=1.000
Non-smoker (n=5)	2 (40.0)	3 (60.0)	

*****Fisher's Exact test was employed to analyze the data. Figure in the parenthesis indicates corresponding percentage.

Depressive disorders were present in 17 (50.0%) patients on steroid and 24 (38.7%) patients not on steroid. Though steroid intake increased the rate of depressive disorders in COPD but did not reach the level of significance. (χ^2=1.144; p=0.285). Association of steroid intake and depressive disorders in COPD was shown in Table-II.

Table-II: Association of steroid intake and depressive disorders

Steroid intake	Depressive disorders		p-value
	Present Frequency (%)	Absent Frequency (%)	
Yes (n=34)	17 (50.0)	17 (50.0)	*p=0.285
No (n=62)	24 (38.7)	38 (61.3)	

*****Chi-Square (χ^2) test was employed to analyze the data. Figure in the parenthesis indicates corresponding percentage.

Depressive disorders were present in 9 (33.3%) patients of duration of COPD of 1 to 5 years, 16 (40.0%) patients of duration of COPD of 6 to 10 years and 23 (52.3%) patients duration of COPD of 11 to 15 years. Though the rate of depressive disorders increased with duration of COPD but did not reach the level of significance (χ^2=2.931; p=0.231). Association of duration of COPD and depressive disorders in COPD was shown in Table- III.

Table-III: Association of duration of COPD and depressive disorders

Duration of COPD	Depressive disorders		p-value
	Present Frequency (%)	Absent Frequency (%)	
1-5 years (n=27)	9 (33.3)	18 (66.7)	*p=0.231
6-10 years (n=16)	16 (40.0)	24 (60.0)	
11-15 years (n=44)	16 (55.2)	13 (44.8)	

*****Chi-Square (χ^2) test was employed to analyze the data. Figure in the parenthesis indicates corresponding percentage.

Depressive disorders were present in 1 (16.7%) patients of stage-II, 17 (37.0%) patients of stage-III, and 23 (52.3%) patients of stage-IV COPD. Though the rate of depressive disorders increased with stage of COPD but did not reach the level of significance (p=0.176). Association of COPD stage and depressive disorders in COPD was shown in Table- IV.

Table-IV: Association of COPD stage and depressive disorders

COPD stage	Depressive disorders		p-value
	Present Frequency (%)	Absent Frequency (%)	
Stage-II (n=6)	1 (16.7)	5 (83.3)	*p=0.176
Stage-III (n=46)	17 (37.0)	29 (63.0)	
Stage-IV (n=44)	23 (52.3)	21 (47.7)	

*****Fisher's Exact test was employed to analyze the data. Figure in the parenthesis indicates corresponding percentage.

DISCUSSION

COPD is considered not only as a disease of the lungs but as a part of the chronic systemic inflammatory syndrome [11]. The complex pathogenesis of COPD along with the associated frequent co-morbidities compel further evaluation and staging because the degree of airflow obstruction is not adequate on its own to fully describe this multi composite disease [12].

In the present study 34 (35.4%) patients use steroid and 62 (64.6%) patients did not use any steroid. In this regards McEvoy *et al*., (1998) found that oral corticosteroids were used in 37.5%, inhalation corticosteroids were used in 22.4% and no corticosteroid was used in 40.1% cases of COPD [13].

Graat-Verboom *et al*., (2009) found that oral corticosteroids were used in 21% and inhalation corticosteroids were used in 75% cases of COPD [14]. Iqbal *et al.*, (2004) found that oral corticosteroids were used in 40.0%, inhalation corticosteroids were used in 26.2% and no corticosteroid was used in 33.8% cases of COPD [15].

Depressive disorders were present in 17 (50.0%) patients on steroid and 24 (38.7%) patients not on steroid. Though steroid intake increased the rate of depressive disorders in COPD but did not reach the level of significance (p>0.05).

In the present study duration of COPD was 1 to 5 years in 27 (28.1%) cases, 6 to 10 years in 40 (41.7%) cases and above 10 years in 29 (30.2%) cases. This result was almost similar to the study of Joythi, (2012) that duration COPD was 1-5 years in 29.4% of cases, 6-10 years in 58.8% of cases and 11-15 years in 11.7% of COPD patients.

In the current study depressive disorders were present in 9 (33.3%) patients of duration of COPD of 1 to 5 years, 16 (40.0%) patients of duration of COPD of 6 to 10 years and 23 (52.3%) patients duration of COPD of 11 to 15 years. Though the rate of depressive disorders increased with duration of COPD but did not reach the level of significance (p>0.05). Depressive disorders increased with the duration of diseases may be due to with the progression of diseases process; Patients become physicaly inactive, weak and breathing become more laborious with increased of diseases sevierity with time. So with increase time , increased depressive disorders. Schneider *et al*., (2010) reported a longer lag time between the first COPD diagnoses [16]. We also found increase rate of depression with increased duration of COPD but difference was not significant may be due to small sample and method of screening depression and diagnosis of depression by DSM-5 criteria.

In this study GOLD stage-III was the most frequent severity of COPD constituted 47.9% of cases, followed by stage-IV (45.8%) and stage–II (6.2%). The patients with stage-III and IV were more as because people of our country are mostly poor and do not come in contact with medical care until terminal stage of illness. This result was consistent with the study of Silva *et al*., (2011) that reported GOLD stage-III was the most frequent severity of COPD constituted 48% cases, followed by stage-IV (28%), stage–II (22%) and stage–I (1%) cases. Graat-Verboom *et al*., (2009) reported GOLD stage-IV was the most frequent severity of COPD constituted 44% cases, followed by stage-III (34%) and stage–I and II (22%) [14]. Nuti *et al*., (2009) found that severity of COPD was mild in 16.5%, moderate in 45.4%, severe in 30.6% and very severe in 7.6% of patients [17].

In this study the depressive disorders were present in 1 (16.7%) patients of stage-II, 17 (37.0%) patients of stage-III, and 23 (52.3%) patients of stage-IV COPD. Though the rate of depressive disorders increased with severity of COPD but did not reach the level of significance. (p>0.05). Although certain findings have not been obtained in previous studies on the relationship between the severity of lung function and depression in COPD patients, there have been reports Wagena indicating that there is no relationship between lung function and depression (Hajiro *et al*., 2000; Wagena *et al*., 2005; Gudmundsson *et al*., 2006) [18-20]. Conversely Van Mannen *et al*., (2002) found the prevalence of depression to be 19.6% in patients with mild to moderate COPD, and 25.0% among patients with severe COPD suggesting an association between the severity of lung function and depression [21]. Dowson *et al*., (2001) reviewed the prevalence of depression and anxiety, using the HADS, in 79 in-patients with COPD, and found that those Dowson with more severe impairment in lung function had higher scores of depression and anxiety [22]. Atlantis *et al*., (2013), in a systematic review and meta-analysis showed that the increased burden of co-morbid depression in COPD likely rises with the degree of disease severity [23]. Iguchi *et al*., (2013) found that the prevalence of depression increased with BODE stage, being 12.5% (1/8) in stage I, 45.5% (5/11) in stage II, 38.2% (13/34) in stage III, and 75% (12/16) in stage IV (P=.02) [24]. In this study the rate of depressive disorders increased with severity of COPD but not significant may be due to small sample size, diagnosis of depression by CES-D scoring and followed by DSM-5.

In the present study depressive disorders were present in 41 (42.7%) COPD group and was in 9 (9.4%) respondents of control group. Significantly higher rate of depressive disorders were present in patients with COPD than that of control subjects (p<0.001). Lou *et al.*, (2014) found that over one third of the subjects (35.2%) had substantial depression symptoms in COPD patients [25]. Depressive symptoms were more frequent in COPD patients than that of control subjects (p=0.001). Van Manen *et al*., (2002) found that the risk of depression (odds ratio, 2.5; 95% confidence interval, 1.2 to 5.4) is higher in patients with severe COPD compared to control subjects, with the highest rates, up to 62%, found in oxygen-dependent patients (Lacasse *et al*., 2001) [21, 26].

CONCLUSION

The results of this study showed that the proportion of depressive disorders is significantly higher in patients suffering from COPD than that of control subjects. Major depressive disorder and persistent depressive disorder are also significantly more frequent in patients of COPD. Thus the null hypothesis is rejected and alternate hypothesis

(hypothesis of this study) is established. A liaison between medicine and psychiatry practice is essential for early detection and treatment of depression in patients suffering from COPD.

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