Depression in Chronic Obstructive Pulmonary Disease Patients

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ABSTRACT

Objective: To determine the frequency of depression in male Chronic obstructive pulmonary disease patients and various factors.

Study Design: Cross sectional validation study.

Place and Duration of Study: Pak Emirates Military Hospital, Rawalpindi Pakistan, from Aug 2019 to Mar 2020.

Methodology: Fifty male patients who presented with Chronic obstructive pulmonary disease in OPD of Pak Emirates Military Hospital and those who fulfilled the exclusion and inclusion criteria, were included in the study. Informed consent was taken from all these patients and they were asked to fulfill the questionnaire containing Patient Health Questionnaire-9 and other questions related to their disease. Patient Health Questionnaire-9 was taken as a reference scale for depression.

Results: Total 50 patients were included in the study; mean age was 63.9±8 years. Overall frequency of depression in male Chronic obstructive pulmonary disease patients were 75%. Moreover, 25% patients had minimal or no depression, 43.75% patients had mild depression, 26% patients had moderate depression, 5.25% patients had severe depression. It was more common in smokers and ex-smokers. However, a remarkable relationship of depression was established with frequency of disease exacerbations, frequency of inhalers used per day, restriction of daily activities, family support, education and income status.

Conclusion: The presence of depression is common in Chronic obstructive pulmonary disease patients. High index of suspicion should be kept while managing Chronic obstructive pulmonary disease patients. Screening for depression should be done by means of simple questionnaires like Patient Health Questionnaire-9. Early diagnosis and prompt treatment lead to good compliance to treatment, improved quality of life and disease outcome.

Keywords: Chronic obstructive airway disease, depression, Patient Health Questionnaire-9 (PHQ-9).

INTRODUCTION

COPD is characterized by the presence of progressive airflow obstruction due to chronic bronchitis or emphysema. It is a significant cause of morbidity and mortality worldwide.[1] It is expected to be the seventh leading cause of morbidity and fourth common cause of mortality by 2030.[2] Cigarette smoking is the most common cause of COPD.[3] Another important cause is biomass exposure which is more common in females presenting with this disease. Depression is common in COPD patients[4] but it is underdiagnosed and undertreated in patients of COPD.[5,6] Its prevalence is between 10% and 42% among stable patients and up to 70% in mostly admitted patients.[4,6,7] Presence of depression leads to non-compliance to treatment; social isolation and it also affects the quality of life.[4,7] Around 40% are affected by severe depressive symptoms or clinical depression. Diagnosis of depression is of paramount importance in these patients so that it can be appropriately managed. There are various ways to diagnose depression of which PHQ-9 questionnaire is an important and reliable tool. This will lead to improvement in disease outcome and good quality of life. PHQ-9 is a brief and time efficient questionnaire for diagnosis of depression in crowded OPD.[7]

Mental health and tranquility have a major impact on COPD patients. They may have limitation of exercises, diminished social working and loss of freedom. Tension and misery are two of the most widely recognized and least-treated comorbidities among COPD patients.[8] Various studies have revealed that probability of depression varies, with regards to assessment criteria, and the state of lung function.[9] Prevalence of depression increases with the level of severity of COPD. It has also been observed through various studies that patients with severe COPD have 2.5 times greater chances of developing depression than patients having controlled state of the disease.[10]

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This study was carried out to assess the prevalence of depression in COPD patients who presented to Pak Emirates Military Hospital Rawalpindi and its association with various factors like current smokers or previous history of cigarettes, tobacco use or huqqa smoking and others.

METHODOLOGY

This cross-sectional study was done on male COPD patients presenting to OPD of Pak Emirates Military Hospital Rawalpindi, Pakistan from Aug 2019 to Mar 2020 after taking informed consent and approval from the hospital ethical committee and IERB No. is A/124/110/BC/20. Sample size was calculated using WHO calculator using prevalence of 6.9 million out of total 199.4 million population as a standard reference. Confidence level was 95%, margin of error 5%, and population portion was 3.482%.[11]

Inclusion Criteria: (1) Patients already diagnosed with COPD previously (2) Male patients with age more than 40 years (3) Patients having current or previous history of cigarette smoking or tobacco chewing or biomass exposure.

Exclusion criteria: (1) Patients having other chronic illness like diabetes mellitus, ischemic heart disease (2) Patients already taking antidepressants (3) female patients with COPD.

All the patients were asked to fill the Urdu version of PHQ-9 questionnaire. For those patients who were unable to read, the questionnaire was read out to them and their response was recorded. The response of all patients in previous two weeks were recorded. Each question is scored from 0 to 3. The score of all 9 questions were summed up to get the total score. Those patients having score of 0-4 were classified as having minimal or no depression, 5-9 having mild depression, 10-14 having moderate depression, 15-19 moderately severe depression and 20-27 very severe depression.

Data was analyzed using SPSS-20. Quantitative variables were summarized as mean with standard deviation while qualitative variables were summarized as frequencies and percentages.

RESULTS

A total of fifty male COPD patients were studied among them mean age was 63.9±8 years and mean score of PHQ-9 was 8.8±5.6. Out of fifty patients 12 patients (25%) had minimal or no depression, 22(43.75%) patients had mild depression, 13 patients (26%) had moderate depression and 3 patients (5.25%)

had severe depression (Figure-2). Aforementioned in view, it can be safely said that depressive symptoms were found in 75% of patients (having mild, moderate and severe depression).
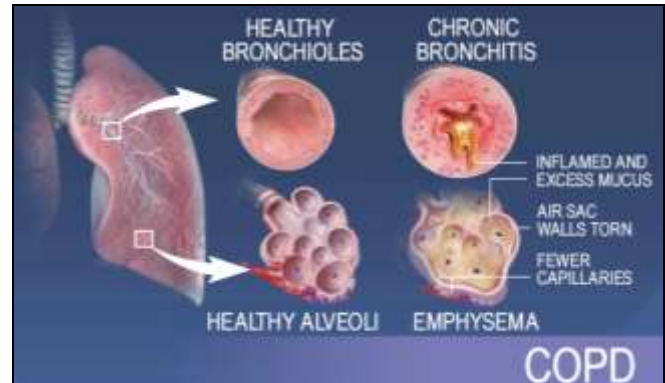

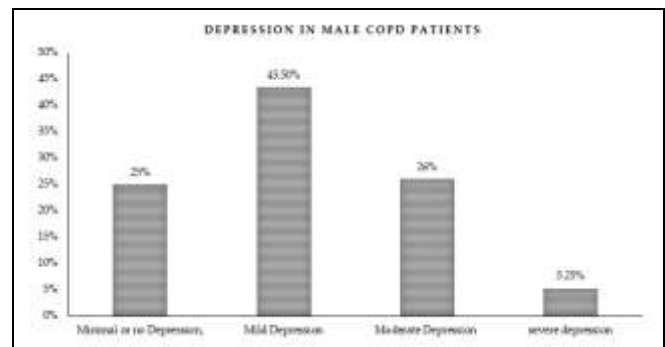**Figure-1 Impact of Chronic Obstructive Pulmonary Disease on Breathing**

Figure-2: Depression in Male COPD Patients

The depression was more common in those patients who were current or ex-smokers. Out of 50, 10(20%) patients were Non-smokers, 31(61%) were ex-smokers and 9(19%) were current smokers (Figure-3).
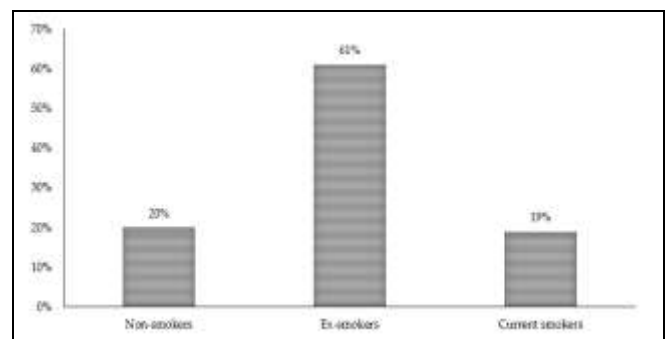

Figure-3: Smoker Status of COPD Patients

Various factors that we have considered regarding estimation of depression in COPD patients were number of exacerbations per year, number of

inhalers used per day, restriction of daily activities, family support, education and income status. It was found that there was a direct relation of depression with number of exacerbations of disease per year, number of times inhaler used per day, restriction of daily activities, lack of family support, low income and education status as shown in the Table.

Table: Factors of Depression in COPD patients

Factors	Frequency (%)
	n=38
More No of exacerbations per year	20(52.6%)
More Number of Inhalers Used Per Day	18(47.3%)
Restriction of daily Activities	15(39.47%)
Family Support	10(26.3%)
Low Education level	22(57.8%)
Low Income Status	17(44.7%)

DISCUSSION

Optimizing management of COPD patients will lead to lessening disease effects, incrementing working, and improving the patient's quality of life.[12] Although there is some proof that uneasiness and despondency may impact the course of COPD, the connection between these elements is perplexing as it affects various facets of COPD and worsens the outcome.[13] Lung harm due to the inflammation of small airways appears to be the primary mechanism for dyspnea and physical disability leading to psychiatric[14] comorbidities in COPD patients.

COPD is an important cause of morbidity and its trend is rising. It is associated with smoking which increases the risk of developing COPD and its severity.[15-19] Smoking, COPD and depression are related to each other. Smoking leads to the development of COPD; and COPD leads to depression and depression makes the patient more liable to smoke.[3] The risk of developing depression in COPD is high as compared to healthy individuals. Both physical and mental ill health is a big challenge for a physician and the patient.[7] If a patient is found to have COPD and depression then both should be treated simultaneously to avoid frequent visit to hospital and admission.[9] Un-recognized and untreated depression leads to serious effects on physical and mental health of patient.[8] It leads to self-isolation, poor compliance to treatment, hopelessness which further aggravates the symptoms.[8]

In this study we have established the prevalence of depression in male COPD patients who presented to OPD of Pak Emirates Military Hospital and its association with various factors. In the present study the frequency of depression is 75% and it is present more in current smokers and ex-smokers. In one study the prevalence of depression is 72% and in that most patients suffered from subclinical depression irrespective of severity of COPD[7] which echoes our findings, in another study depression is more common in patients with low income status[7] and in our study most of our patients belong to low or lower middle class.

A study done in China revealed that depressive symptoms ranged from 13 to 70% and it was more common in females having mild depression, and more in smokers and more in those having ill health.[2]

The heavy burden of OPD make it difficult to diagnose depression in patients but is equally important as without proper diagnosis it cannot be treated and if left un-diagnosed and untreated it leads to un-favorable outcomes and impair quality of life of patients.[8] There are many scales for the diagnosis of depression among which we have used PHQ-9 for the research. Pulmonary rehabilitation, cognitive behavioral therapy and medications are useful for treating depression in these patients.[7] The role of drugs for treating depression is not well established. But, there is no reason to avoid their use.[10] There are multiple barriers for the diagnosis and treatment of depression which include (1) patient related barriers due to lack of knowledge and hesitation in conveying symptoms related to depression[8] (2) physician related which include lack of time for consultation because of over burden.

In 2018, researchers found that almost half of the COPD patients reported to have experienced stressful events that have impacted their lives.[15] It was also suggested that experiencing stressful life events was associated with increased future symptoms of depression and anxiety, while no effect of stressful life events on other physical outcomes, including dyspnea, health status, and COPD exacerbations, was identified. It was also found that stressful life events may be associated with a future decrease in physical activity. The three most commonly reported stressful life events in that study participants were "loss of close relatives/important persons" (31%), "patient's own conditions" (21%), and "disease of relatives/important persons" (19%), accounting for more than 70% of all events. It was also found out that health-related events were perceived differently from those events that were

not health related (e.g., financial worries, unemployment, and divorce).

Researchers in different part of the world have found that coherence of physical and mental health was unsatisfactory. Recent studies have shown encouraging results for cognitive behavioral therapy (CBT) with regards to treatment of depression and anxiety. It tends to ascertain patients' current difficulties and issues. CBT explores the co-relation between a patient's current situation, physical symptoms, thoughts, emotions and behavior. Techniques are implied to handle current difficulties and counselling the patient to identify unhelpful thoughts or behavior which might be provoking cycles of anxiety and/or depression. Proper knowledge of patient's problems can then lead to identify more ways to address these problems and to devise techniques that are useful to improve the patient's quality of life.

A study that was carried out at Psychiatry Department, Zagazeg University, Egypt on April 2015, revealed that depression and anxiety symptoms were considerably more in those patients who were hospitalized and were having severe state of COPD[16] leading to increased mortality rate. It was also found in consensus with various previous studies that quality of life measures predict the risk of readmission in hospital and mortality irrespective of other risk markers. According to observation that anxiety-depressive symptoms were associated to hospital readmission, poor prognostic value and mortality rate independently. There could be different underlying mechanisms (1) Patients having depression generally feel hopeless regarding changing state of current life affairs lacking the drive to seek help and hospital readmission. (2) Depression can affect the hypothalamic-pituitary-adrenal axis functioning which can aggravate health status. (3) Anxiety-depressive symptoms can impair self-care, as indicated by insufficient nutritional intake, consistent smoking, lower activity levels, poor medication compliance. These factors lead to decline of health and need to be addressed along with the treatment of COPD.

The limitation of this study is that it was done only on male patients and in single centre which doesn't cover all the population. Female patients were not included in this study who have high prevalence of depression related to this disease and other issues as proved in some studies.

CONCLUSION

Depression is commonly associated with COPD so it should be diagnosed in all patients so that along with treatment of COPD, depression can also be managed. This would lead to improvement in quality of life. Further studies should be conducted at multiple centres and should include both genders so that wide population can be studied. Every physician dealing with COPD should maintain a high index of suspicion regarding the presence of anxiety and depressive symptoms, as well as the possibility of a major anxiety or depressive disorder. Simple screening questionnaires, especially when self-administered, may therefore be of value in identifying patients requiring a more detailed evaluation.[17]

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SDM & SN: Data acquisition, data analysis, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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