



Evaluation of Depression and Variables Associated With Severity of Depression in Patients with Chronic Obstructive Pulmonary Disease (COPD)

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Abstract

Background: COPD is a respiratory disorder which has association with many comorbid illnesses. Psychological impairment in the form of depression is one such a significant comorbid condition whose impact on COPD is generally overlooked. This study was done to assess the risk of depression and factors correlating with severity of depression in patients with COPD.

Materials and Methods: 100 patients with a registered diagnosis of COPD attending outpatient section in respiratory medicine department were enrolled. Demographic and Clinical history recorded. Severity of COPD was assessed using spirometry(GOLD guidelines) and degree of depression assessed using PHQ-9(Patient Health Questionnaire).

Results: Cummulative prevalence of depression in our study was 76% of which 13% had major depressive symptoms. Severity of depression had a strong positive correlation with increased severity of COPD,increased degree of dyspnoea and prolonged duration of illness.

Conclusion: Prevalence of depression in COPD is generally underestimated. Using simple screening questionnaire either at bedside or during regular follow up visits to detect depression should be made mandatory in

every case of COPD. This might help in planning psychological intervention if any at the earliest and also improve the quality of life along with other pulmonary rehabilitation measures.

Keywords: PHQ-9, COPD, Depression.

Introduction

COPD being a chronic disease with persistant respiratory and functional impairment is known to affect the quality of life and also interfere with psychosocial well being of the individuals. The prevalence of depression in COPD varies from 10% to 42%.⁽¹⁻⁴⁾ Association of depression with COPD varies where few studies have quoted a strong correlation and others have not.⁽⁵⁻⁶⁾This discrepancy is mainly because of difference in study population,demographic factors,study design,sample size and questionnaire used. Henceforth we hereby assess the risk of depression in COPD with a simple questionnaire which can be used in clinical practice at ease.

Materials and Methods

This cross sectional study was done on 100 registered cases of COPD attending outpatient section of respiratory medicine department in a tertiary care center. Study duration was 3 months(1/10/2017 to 31/12/2017).Patients who met the following inclusion criteria were

enrolled.1)Age>40yrs,2)Current/Exsmoker with a pack year of >10(PACK YEAR:Total number of packs of cigarettes smoked/Total duration of exposure in years),3)Post bronchodilator spirometry FEV1/FVC <0.70,4)Willing to take part in the study. Patients suffering from other concurrent chronic systemic illness like Hepatic diseases,renal diseases,malignancy,known psychiatric disorder were excluded. Clinical data on duration of symptoms and degree of dyspnoea(MMRC scale) recorded. Spirometry performed by a trained technician with standard calibration as recommended by ATS(American Thoracic Society). 3 acceptable and 2 reproducible maneuvers were used for analysis. FEV1,FVC values were expressed in liters/min and FEV/FVC as ratio. Grading of patients on spirometry results was done by GOLD guidelines.⁽⁷⁾

Self administered PHQ-9 questionnaire were given to study patients. For illiterate patients the questionnaire was read out with help of paramedics, translated to local language and adequate time given for patients to respond. PHQ-9 questionnaire had nine items each one given a score between 0(Not at all) to 3(Nearly everyday) with a total score ranging from 0-27. Depression severity was classified based on PHQ-9 score as depicted,0-4(none),5-9(mild),10-14(moderate),15-19(moderate-severe) and 20-27(severe).⁽⁸⁾

Statistical Analysis

Done using Stastical package for social sciences (SPSS-version 21) and P value of <0.05 was considered significant.Categorical data was compared using Chi-square test.

Working definitions

a) Socio-economic status:

- <5000/month – low income
- 5000- 10000/month – middle income
- >10000/month – high income

b) Education⁽⁹⁾

- Illiterate – Not been to school
- Prim. <10th std
- High school – 10th std and above

c) Modified Medical Research Council (mMRC) Dyspnoea Scale for grading the severity of breathlessness during daily activities.⁽¹⁰⁾

Grade	Symptom complex
0	I only get breathless with strenuous exercise
1	I get short of breath when hurrying on level ground or walking up a slight hill
2	On level ground, I walk slower than people of the same age because of breathlessness, or I have to stop for breath when walking at my own pace on the level
3	I stop for breath after walking about 100 metres or after a few minutes on level ground
4	I am too breathless to leave the house or I am breathless when dressing or undressing

d) Spirometry Findings.⁽⁷⁾

Gold guidelines:

- FEV1/FVC-<70% and
- FEV1 \geq 80% - Mild obstruction
- 50 – 79% - Moderate obstruction
- 30 – 49% - Severe obstruction
- < 30% - Very Severe obstruction

Results

All 100 patients enrolled were men and the mean age of study population was 58.6+/- 8.9. The demographic characteristics of patients is depicted in TABLE:1. 43% of

them were above the age of 55 years and around 76% had educational qualification less than that of primary schooling. Clinical variables are summarized in TABLE:2. 2/3rd of them had dyspnoea of grade 1 to 2 (MMRC- scale).

Spirometry and PHQ-9 results are shown in TABLE:3. Overall prevalence of depression in COPD in our study was 76% of which approximately 13% of them had major depressive symptoms. Variables which had a strong correlation with severity of depression includes advanced age, low educational qualification, prolonged duration of symptoms and increased severity of dyspnoea. (TABLE:4). Severity of COPD also had a positive correlation with degree of depression (P value = 0.001).

Discussion

Patients with chronic respiratory disorders generally suffer from subclinical to milder forms of depression which goes unnoticed. The incidence of COPD is on the rising side and psychological comorbidities associated with this chronic disease needs to be addressed as this might increase the burden of physical disability.⁽¹⁾ Progressive nature of the disease, persistent dyspnoea, hypoxia in addition to advanced age, poor financial status and non availability of pulmonary rehabilitation centers increases the risk of depression in these patients.⁽²⁾

Pulmonary rehabilitation is a multimodality targeted individualized therapy given to chronic stable respiratory disease patients. Components of the programme include

- A) Education – About chronic nature of the disease, usage of inhalers etc,
- B) Exercises – Breathing exercises, endurance training, limb strengthening exercises,
- C) Psychosocial counseling

D) Nutritional advice – High protein diet etc. Documented benefits of undergoing this programme include decrease in - severity of symptoms, frequency of hospitalisation, psychological symptoms and thus an improvement in overall quality of life.

The prevalence of depression in COPD in our study was 76%. Moderate - severe forms of depression was seen in patients belonging to stage 3 to stage 4 of COPD. Solano et al in his study observed depression in COPD ranging from 37- 71%.⁽¹¹⁾ Kunick et al did one large screening study in urban areas of south India and reported that 70% of patients with chronic respiratory diseases have depression.⁽¹²⁾ Advanced age, low educational qualification, and socio-economic status were demographic variables having a significant correlation with risk of depression in our study.

Avasthi et al had also pointed out a high prevalence of depression in patients having poor education and those below poverty line.⁽¹³⁾ Severity of depression was more in patients having prolonged duration of illness (p value=0.006) and increased severity of dyspnoea in our study (p value=0.001). Manen et al in his study also found similar relationship⁽¹⁴⁾ stressing the need for regular medical management to bring down the severity of dyspnoea and the need for pulmonary rehabilitation programmes to improve the overall quality of life and disease morbidity.

Severity of COPD measured by spirometry had significant relationship with levels of depression (p value= 0.001) and patients with severe to very severe COPD were at increased risk of major depressive symptoms compared to mild- moderate COPD cases.

Manen et al observed that severe COPD patients had 2.5 times increased risk of developing depression⁽¹⁴⁾ whereas Wagena et al⁽¹⁵⁾ did not find any similar correlation. This

discrepancy is mainly based on study population and questionnaire used.

Conclusion

COPD is a disease which requires multimodality treatment including cognitive behavioural therapy and pulmonary rehabilitation. RCT(Randomized Controlled Trials) have shown that pulmonary rehabilitation programmes improve psychological illness related to COPD. Depression remains under diagnosed due to non specific symptoms, henceforth all COPD patients should undergo screening tests for depression and psychiatric evaluation obtained for those who have symptoms of major depression.

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Table:1- Demographic Data

S.No	Variables	(n=100) (%)
1.	Age:	
	< 55 yrs	57%
	> 55 yrs	43%
2.	Education:	
	Illiterate	32%
	Primary School	44%
	High School	24%
3.	Socio Economic Status:	
	Low	56%
	Middle	42%
	High	2%

Table:2 - Clinical Data

S.No	Variables	(n=100) (%)
1.	Duration of Symptoms:	
	≤10 yrs	57%
	>10yrs	43%
2.	Degree of Dyspnoea (MMRC-Grade)	
	0	Nil
	1	23%
	2	46%
	3	31%
	4	Nil

Table:3 - Spirometry and PHQ 9 results

S.No	Variables	(n=100) (%)
1.	Spirometry (GOLD – Staging)	
	Mild	24%
	Moderate	42%
	Severe	33%

	Very Severe	10%
2.	PHQ – 9 Grading:	
	Normal	24%
	Mild	32%
	Moderate	31%
	Moderate – Severe	9%
	Severe	4%

Table: 4 - Relationship between Disease Related variables with Depression

	PHQ - 9					X ²	P Value
	Normal	Mild	Moderate	Moderate to Severe	Severe		
Duration of Symptoms:							
≥10yrs	14 (24.6%)	24 (42.1%)	17 (29.8%)	0	2 (3.5%)	16.317	0.006
<10yrs	10 (23.3%)	8 (18.6%)	14 (32.6%)	9 (20.9%)	14 (32.6%)		
Dyspnoea (MMRC-Grade)							
1						23.140	0.001
2	9(39.1%)	9(39.1%)	5(21.7%)	0	0		
3	9(19.6%)	18(39.1%)	15(32.6%)	1(2.2%)	3(6.5%)		
	6(19.4%)	5(16.1%)	11(35.5%)	8(25.8%)	1(3.2%)		
Spirometry (Gold - Stage)							
Mild	11(45.8%)	6(25.0%)	6(25.0%)	0	1(4.2%)	52.340	0.001
Moderate	9(21.4%)	17(40.5%)	14(33.3%)	0	2(4.8%)		
Severe	4(12.1%)	9(27.3%)	11(33.3%)	9(27.3%)	0		
Very Severe	0	0	0	0	1(100%)		