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Original Research Article

Depression and COPD-association: not out of the blue

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ABSTRACT

Background: Depression is frequently associated with C.O.P.D. patients. Currently available treatment modalities are having limitations and chronic progression of the disease process in general causes decreased effort tolerance and poor socialization due to chronic cough and dyspnoea. Poor socialization and chronic symptoms result in mild depression to dysthymia and clinical depression. Three or more comorbidities associated with C.O.P.D. results in higher morbidity and mortality. Physician treating C.P.O.D. patients can use simple questionnaire based Hamilton depression scale to identify the patients having depressive symptoms.
Methods: 50 diagnosed COPD patients as per GOLD guidelines were enrolled in the study after consideration of inclusion and exclusion criteria. Each patient was screened for depression using 17-point Hamilton depression scale. The results were tabulated and analyzed for statistical significance and compared with the data available on this topic.
Results: Out of 50 stable COPD (diagnosed as per GOLD guidelines) patients enrolled for the study, 36 (72%) were males and 14 (28%) were females and in 19 (38%), (15 males and 4 females) patients HAM-D score was suggestive of depression. 10 (62.5%) patients from severe obstruction category (GOLD III) had mild depressive symptoms on HAM-D scale.
Conclusions: Considering the fact that a significant number of COPD patients enrolled for the study had depressive symptoms, it is advisable to screen the patients for depression and psychiatrist consultations should be considered when required.

Keywords: Depression, HAM-D scale, Stable C.O.P.D.

INTRODUCTION

COPD is a treatable and preventable, multisystem disorder and associated with various co morbidities. Anxiety and depression in COPD are associated with poor prognosis and most often depression is under diagnosed (GOLD-2017). Chronic cough, mucus production and breathlessness results in limitation of activities (functional impairment) and poor socialization resulting in depression. Overall quality of life is negatively affected in COPD. Several studies show depressive disorders in 27-79% in COPD.[1,2] There is high rate of cigarette smoking, in depressed individuals, which is the most important risk factor for COPD.[3] A recent meta-analysis suggested that COPD has increased risk of depression, with the relative risk being 1.69. (RR, 1.69; 95% CI, 1.45-1.96).[4]

Depression in COPD is associated with poor compliance to treatment, frequent hospitalizations, more doctor visits, prolonged hospital stay, poor quality of life and high cost of treatment.[1] Under diagnosed depression has deleterious effects on patients with COPD, on physical functioning and on social interaction, resulting in increased fatigue and healthcare resource utilization.[5,6] In the present study quality of life of COPD patients was better correlated to,

depression than measured FEV1, Yohanes et al.[7] Depression in COPD is difficult to diagnose and treat due to overlapping similar symptoms. COPD patients, having more than three or more comorbidities have higher chances to be hospitalized frequently and die prematurely compared to patients without comorbidies.[8] Purpose of this study is to find the association of stable COPD patients with depression and create awareness about the association of 'depression and COPD' among the readers to make mindset for evaluate for depression in COPD.

The aims and objectives of the present study was to observe the association of depression and COPD and correlation of BMI, smoking and COPD.

METHODS

Fifty consecutive stable COPD patients (diagnosed on the basis of GOLD guidelines), attending chest outpatient department and referrals at ESI-post-graduate Institute MGM Hospital, Mumbai, India, from the period May 2013 to July 2014 were evaluated for the enrollment in the study.

Inclusion criteria:

- Stable COPD patients
- Patients between 35 and 80 years of age.

Exclusion criteria:

- Pregnant patients
- Patients less than 35 years of age
- History of recent AMI, stroke
- Patients in exacerbation
- Moribund patients.

After obtaining approval from Institutional Ethics Committee, written informed consent was obtained from every patient who fulfilled the inclusion and exclusion criteria. 'patient information sheet' (English, Hindi and Marathi versions) was administered to all enrolled patients'.

Case study proforma was filled for each patient. Standard medical history and physical examination were undertaken for each enrolled patient. Diagnosis of COPD was made as per standard guidelines (GOLD). All patients were subjected to chest X-ray and CT chest if needed and spirometric assessment with bronchodilator reversibility test was done after administration of short-acting inhaled bronchodilator.

Classification of severity of airflow limitation in COPD-GOLD classification:

- Mild COPD: FEV1 >80% of predicted
- Moderate COPD: 50% >FEV1 P 80% of predicted
- Severe COPD: FEV1< 30% predicted.

Hamilton-D questionnaire (17 items) was administered to all the enrolled patients to screen for depression and score was recorded.

Statistical methods applied

SPSS software was used for analysis of data. Chi square test and Kruskal Wallis test were used for further analysis of data and inference was drawn. Data from available literature was compared with the study results.

RESULTS

27 patients were from GOLD II grade, 16 patients were from GOLD III grade 7 patients from GOLD IV categories. 18 patients were from 60-69 years of age, and 19 patients from 50-59 years of age (n=50).

Table 1: Baseline characteristics of the patients enrolled for the study.

Characteristics (n-50)	Findings
Gender (n=50)	Males-36, Females-14
Age distribution (n-50)	
40-49	07
50-59	19
60-69	18
70-80	06
Smoking history and history of exposure to noxious gases, particles and other agents (n=50)	**No. of patients**
Current smokers	06
Former smokers + exposure to other agents	18 (13+5)
No obvious history of exposure to noxious gases/ particles	18
Biomass fuel exposure	08
Mean BMI (n=50)	22.62
GOLD I, II, III, IV(n=50)	II-27, III-16, IV-07

Table 2: Gender wise distribution-COPD.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	F	14	28.0	28.0	28.0
	M	36	72.0	72.0	100.0
	Total	50	100.0	100.0	

Table 3: COPD gender cross tabulation.

COPD GOLD grades		Gender		Total
		F	M	
Moderate	Count	10	17	27
	% within COPD	37.0%	63.0%	100.0%
	% within sex	71.4%	47.2%	54.0%
Severe	Count	3	13	16
	% within COPD	18.8%	81.2%	100.0%
	% within sex	21.4%	36.1%	32.0%
Very severe	Count	1	6	7
	% within COPD	14.3%	85.7%	100.0%
	% within sex	7.1%	16.7%	14.0%
Total	Count	14	36	50
	% within COPD	28.0%	72.0%	100.0%
	% within sex	100.0%	100.0%	100.0%

Table 4: Chi-square tests.

	Value	df	Asymp. sig. (2-sided)
Pearson Chi-square	2.426[a]	2	0.297
Likelihood ratio	2.517	2	0.284
No. of valid cases	50		
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.96.			

Table 5: Hamilton-D scale score.

Score		Findings (No. of patients) (n=50)
0-7	Normal (no depression)	31
8-13	Mild depression	17
14-18	moderate depression	02
18-22	Severe depression	00
>=22	very severe depression	00

Table 6: COPD depression grade cross tabulation.

Depression grade					Total
COPD GOLD grades		Normal	Mild depression	Moderate depression	
Moderate GOLD II	Count	24	3	0	27
	% within COPD grade	88.9%	11.1%	0.0%	100.0%
	% within depression cat	77.4%	17.6%	0.0%	54.0%
	Residual	7.3	-6.2	-1.1	
Severe GOLD III	Count	5	10	1	16
	% within COPD grade	31.2%	62.5%	6.2%	100.0%
	% within depression cat	16.1%	58.8%	50.0%	32.0%
	Residual	-4.9	4.6	.4	
very severe GOLD IV	Count	2	4	1	7
	% within COPD grade	28.6%	57.1%	14.3%	100.0%
	% within depression cat	6.5%	23.5%	50.0%	14.0%
	Residual	-2.3	1.6	.7	
Total	Count	31	17	2	50
	% within COPD grade	62.0%	34.0%	4.0%	100.0%
	% within depression cat	100.0%	100.0%	100.0%	100.0%

Table 7: Chi-square tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	19.070[a]	4	.001
Likelihood ratio	20.400	4	.000
Linear-by-linear association	15.137	1	.000
No. of valid cases	50		

There were 18 former smokers and 6 current smokers. 8 patients had history of exposure to biofuel mass. Mean BMI was -7.04.

There were 17 patients from mild depressive category (n=50). Two patients had HAM-D score suggesting moderate depression. Total number of patients having HAM-D score in the range of depression- 19 (38%)

Out of 50 enrolled COPD patients 17 were falling in mild depressive category and 2 patients were in moderate

depressive category. 13 patients had normal HAM-D score. 10 (62.5%) patients from GOLD III category had mild depression and 4 patients GOLD IV) had mild depression. One patient each from GOLD III and IV had moderate depression.

DISCUSSION

Due to chronic nature of the disease, and limitations of current treatment modalities, quality of life is adversely affected and significant number of patients are experiencing depressive symptoms. Depression can be considered as a cause and effect for COPD, as depressive persons in general tends to smoke more. While evaluating the relationship, between these two, we land up in a 'paradox', because evidence suggests that smoking may cause depression, but smokers smoke to get relief from depressive state of mind.[9] Smoking is an important etiological agent for both COPD and depression, ultimately resulting in vicious cycle. The tool we have used to measure depression is Hamilton Depression Rating Scale or HAM-D or HDRS. Hamilton questionnaire, is a simple questionnaire to be administered by a health care professional to COPD patients, which was originally published by Max Hamilton in 1960 and revised several times. The questionnaire is designed for adults and is used to rate the severity of depression, mood, guilt, suicidal tendencies, insomnia, agitation or retardation, anxiety, loss of weight and somatic symptoms.[10]

Patients with COPD may have a spectrum of symptoms ranging from short-term depressive symptoms to dysthymia to clinical depression.[11]

In the present study, out of 50 stable COPD (diagnosed as per GOLD guidelines) patients enrolled for the study, 36 (72%) were males and 14 (28%) were female patients. HAM-D score was suggestive of depression, in 19 (38%), 15 males, 4 females patients. 10 (62.5%) patients from severe obstruction category (GOLD III) had mild depressive symptoms on HAM-D scale. Out of 7 patients from very severe (GOLD IV), 4 (57.1%) had mild depression and one patient from each (from GOLD III and IV) had moderate depression on HAM-D scale.

In a study by Catalfo G et al, 73% out 52 enrolled COPD patients had exceeded a cut of limit of HAM-D score.[12]

A study by van Manen JG et al showed in patients with severe COPD (FEV1 <50% predicted), the prevalence of depression was 25% compared with 17.5% in controls and 19.6% in patients with mild to moderate COPD.[2] In a similar study done by Sejal De, using patient health Questionnaire-9 (PHQ-9) cumulative prevalence of depression in the study population was 72%.[13] In another similar study depression was associated in 39.7% of COPD patient.[14] In one more similar study, 62 (49.2%) patients showed mild to severe depressive symptoms and 26 (20.6%) patients had a major depressive disorder, followed by 16 (12.7%) who had moderate depression and 20 (15.9%) patients had mild depression.[15] A recent longitudinal study by Schnider, 35722 COPD patients and the same number without COPD were followed up for ten years the incidence of depression was 16.2 cases per 1000 (person-years) in COPD group and same was 9.4/1000 (person-years) in control group, OR: 2.01; 95%CI, 1.45-2.78.[16]

Mean HAM-D score of the patients enrolled in the present study was 7.04. In the current study 13 males and 6 females had HAM-D score pointing towards depression. Out of these patients 17 patients HAM-D score was between 8 to 13 which is suggestive of mild depression and in two patients score was between 14 to 18, suggestive of moderate depression. In a similar study mean HAM-D score was 10.7 (SD=8.2) (20.0% subjects scored ≥17). Depression was significantly higher in women (Z=-1.971: p=0.049). Lower value of FEV1 correlated with higher HAM-D score (ρ=-0.321; p=0.042).[17]

In the present study mean BMI (n=50) was found to be 22.62 and 12 patients had low BMI: (8 males and 4 females). In one study Mean BMI at baseline, the 'depressive subgroup' was overweight (24/38 patients, =63%, had a mean BMI 28.37±6.80) and the 'non-depressive' subgroup was normal weight (4/14 patients, =28%, had a mean BMI 24.96±4.1.[12] A positive correlation between female gender, BMI and depression was found in a study of 119 COPD patients in a similar study.[20] BMI in patients with depression was with COPD was 17.38±3.25 and it was 18.60±3.47 in patients without depression in another study.[18]

In current study, Total number of former smokers and patients exposed to other agents were 18 (36%) and 6 (12%) were current smokers. Apart from smoking, exposure to biofuel mass (indoor air pollution) was noted as contributing factors in the study patients. In a study, about COPD and depression in the patients, there were 32 smokers, 38 former smokers and 10 patients were nonsmokers (n=80).[19] In a similar study, smoking index was 811.17±654.01.3 in depressive patients (n=127), and the same was 7.30.45±672.01 (n=193).[15] However, there was no significant difference between mean ranks of HAM-D score for depression in non-smoker (MR); 21.17, current smokers (22.70%), and in former smokers' MR was 20.04 in the present study. A large study consisting of 2,118 subjects with COPD; 335 smokers without COPD (smokers); and 243 nonsmokers without COPD (nonsmokers' prevalence of depression in COPD patients (n=2118), smokers without COPD (n=335) and nonsmokers without COPD (n=243). The prevalence of depression was 26%, 12% and 7% in COPD patients, smokers and nonsmokers, respectively.[20]

Limitations of this study were small sample size, HAM-D score requires additional time for clinician to administer

the test, HAM-D was developed before DSM-V (Gold standard for diagnosis of depression.

CONCLUSION

38% of the enrolled COPD patients in this study showed depressive symptoms on HAM-D scale while screening for depression There is a little evidence that routine screening may improve treatment of depression in COPD. Questionnaire based tool such as HAM-D can be used in COPD patients to evaluate for depressive symptoms. Considering the fact that, depression has an impact on prognosis, quality of life, hospitalizations, a clinician treating COPD patients should evaluate all patients for depression by using HAM-D scale and referral of patients to psychiatric services can be made as per the need.

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