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Original Research Article

Study of Anxiety and Depression in COPD (Chronic Obstructive Pulmonary Disorder) Patients of Maharashtra

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Abstract:

Background: The mechanism of depression and anxiety in COPD is still not completely understood. The biological mechanism between COPD and mental illness has to be evaluated.

Method: 95 patients aged between 40-70 years with COPD in depression and anxiety was studied. They were subjected to a detailed clinical examination, and COPD was diagnosed as per GOLD guide lines with a post-bronchodilator fEv1/FEV<70 nMRC score. Spirometric study, psychological assessment by the HAM-D method, and anxiety assessment by the MADRS method.

Results: 44 (46.3%) had anxiety, and 51 (53.6%) had depression. In a comparative study of no depression, respiratory and psychiatric parameters had a highly significant p value ($p<0.001$).

Conclusion: COPD patients with co-morbid anxiety and repression experience more acute exacerbations and need pulmonary rehabilitation. Management of anxiety and depression in COPD will reduce readmissions and mortality.

Keywords: Anxiety, Depression, COPD, HAM-D, MADRS.

Introduction

Chronic obstructive pulmonary disease (COPD) is a major health problem; 3.23 million fatalities were reported globally. It is the third most common cause of death worldwide. About 90% of COPD deaths occur in people less than 70 years of age, mostly in lower and middle socio-economic societies [1]. The relationship between COPD and mental health has recently attracted a lot of research attention, given its impact on quality of life [2]. COPD has a significant negative impact on patients health, particularly anxiety and depression. It is reported that major depression was observed in COPD as compared to other depressive illnesses. In addition, dyspnea and anxiety are closely related [3]. The pathophysiology of depression and anxiety in COPD is still not completely understood [4]. Hence, an attempt is made to evaluate COPD in depression and anxiety patients.

Material and Method

95 (ninety-five) patients regularly visited the psychiatry department of MIMSR Medical College Latur (413531 Maharashtra) were studied.

Inclusive Criteria: COPD patients with no history of exacerbations in the last two months. Post-bronchodilator ratio of forced expiratory volume in one second to forced vital capacity less than 0.70 (FEV1/FEV<0.70). The age group is between 40-70 years. The patients who gave written consent for treatment were included in the study.

Exclusion Criteria: The patients suffer from acute exacerbations (admitted to the hospital for worsening of respiratory symptoms), attended the emergency department, and have been on antibiotics and systemic corticosteroids for one month. Patients already on antidepressant or anti-anxiety treatment were excluded from the study.

Method: A detailed history pertaining to the baseline data, smoking history, duration, and severity of COPD symptoms. A BMI was recorded, a chest x-ray was taken in every patient, and a CT scan was studied if necessary. The CAT (COPD assessment test), which is an 8-item measure of impairment in the health status of COPD patients; An unpacked 6-minute walk test was performed to assess exercise tolerance and physical activity.

A modified Medical Research Council scale was applied to obtain dyspnea scores. A history of moderate or severe exacerbations of symptoms was

noted. BODE (body mass index, airflow obstruction, dyspnea, and exercise capacity), a composite score that serves as a good predictor for the severity of disease and subsequent survival rate, was calculated.

A spirometric assessment was done after the administration of a short-acting bronchodilator. COPD diagnosis was as per GOLD (Global Initiative for Chronic Obstructive Lung Disease) lines [5].

Anxiety was measured using the Hamilton anxiety scale (HAM-A), while depression was measured using the Montgomery-Asberg depression scale (MADRS) [6]. The duration of the study was May 2022 to June 2023.

Statistical analysis

A comparison of anxiety, depression, and non-depression was carried out using the t test formula, and significant results were noted. The statistical analysis was carried out in SPSS software. The ratio of males and females was 3:1.

Observation and Results

Table 1: Comparison of anxiety and depression patients 14 (14.7%) have anxiety, 30 (31.5%) have no anxiety, 44 (46.3%) have no depression, and 51 (53.6%) have depression.

Table 2: Comparison of depression and no depression patients

- Body mass index: 18.2 (±2.1) in depression patients and 20.25 (± 3.2) in no depression patients; t test was 3.54 and p<0.001
- Smoking Index: 562 (± 4) in depression patients, 552 (±2) in no depression patients; t test was 15.7 and p<0.001
- FVI pred.: 48 (± 2) are depression patients, 55 (± 4) are not depression patients, t test 10.5 and p<10.001
- CCQ score: 26 (±3) depression patients, 19 (± 2) in no depression patients, t test: 135 and p<0.001.
- HAM score: 16 (± 4) depression, 8 (± 2) in no depression patients, t test was 12.5 and p<0.001
- 6 MWD: 412.75 (± 2.6) in depression, 432 (± 4.2) in no depression patients, t test is 27 and p<0.001

Table 3: Comparison of clinical manifestations in depression and no depression patients in No depression patients

- HR – 85.2 (± 13.1) in pre-test, 95.4 (± 15.4) in post-test; t test: 3.44 and p<0.001
- In depression, HR is 92.3 (±12.8) in the pre-test and 111 (± 16.3) in the post-test; the t-test is 6.14 and p<0.001.
- In No depression RR – 19.5 (± 2.96) in the pre-test, 27.5 (± 4.4) in the post-test; t test was 102 and p<0.001
- In depression RR 20 (± 2.88) in the pre-test and 30.2 (± 5.4) in the post-test; the t test was 11.2 and p<0.001 patient.
- In no depression patient, SPO2 – 98.4 (± 1.15) in the pre-test and 95.8 (± 5.10) in the post-test; the t test was 3.31 and p<0.002.
- In depression SPO2 – 96.4 (± 2.7) in the pre-test and 94.5 (± 2.2) in the post-test; the t-test was 3.77 and p<0.001.
- BORG score – In No depression, 0.1470 (± 0.43) in the pre-test, 1.6 (± 1.3) in the post-test, t test was 7.08 and p<0.001.
- In depression patients, 0.35 (± 0.67) in the pre-test and 2.62 (± 1.6) in the post-test, the t test was 8.77 and p<0.001.
- BORG score for leg fatigue was 0.57 (± 1.36) in the post-test of no depression and 1.26 (± 1.72) in the post-depression patient; the t test was 2.4 and p<0.001.
- Leg cramp – 3 (± 4.8) in post-test of no depression, 12 (± 24.4) in depression patient 2.40, and p<0.001.
- 6 MWD – 428 (± 75.8) in post-test of no depression patient, 411.77 (± 89.5) in depression patient; t test was 0.99 and p>0.32 (p value is insignificant).

Table 1: Comparison of anxiety and depression patients

	No anxiety	Anxiety	Total
No depression	30	14	44
Depression	14	37	51
Total	44 (46.3%)	51	95

No anxiety 44 (46.6%), Anxiety 51 (53.6%), Depression 51 (53.6%), 44 (46.3%) no depression

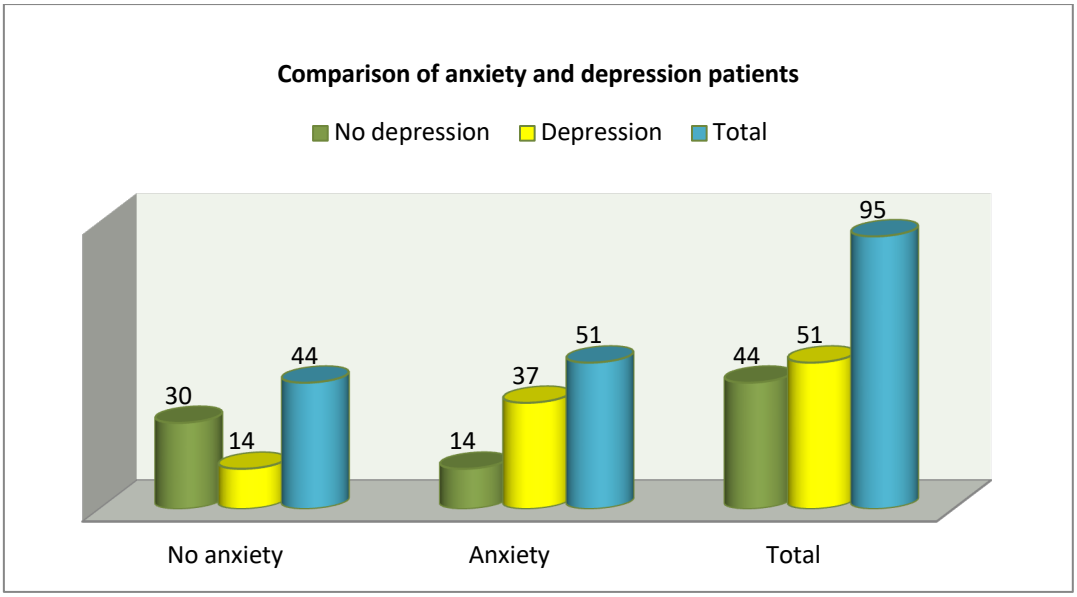

Figure 1: Comparison of anxiety and depression

Table 2: Comparison of respired manifestation in depression and no depression patients

Respiratory Manifestation	Depression (51)	No depression (44)	t test	p value
Body Mass Index	18.2(± 2.1)	20.2(± 3.2)	3.54	P<0.001
Smoking Index	562(± 4)	552(± 2)	15.7	P<0.001
FV1 % pred.	48(± 2)	55(± 4)	10.5	P<0.001
FV1 L	1.102(±2.2)	1.198(± 1.8)	0.28	P>0.81
CCQ score	26(± 3)	19(± 2)	13.5	P<0.001
HAM-D score	16(± 4)	8(± 2)	12.5	P<0.001
6 MWD (Minute walk distance)	412.75(± 2.6)	432.5(± 4.2)	27	P<0.001

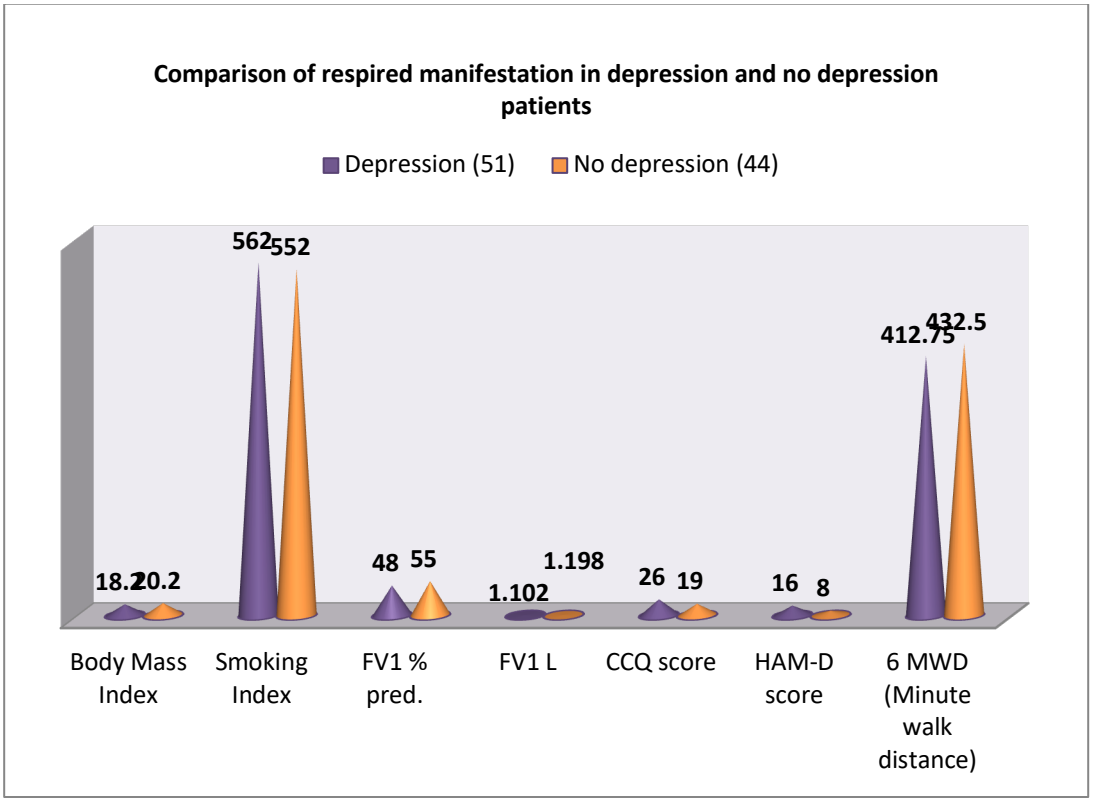

Figure 2: Comparison of respired manifestation in depression and no depression patients

Table 3: Comparison Clinical Manifestation in both depression and No depression patients

Manifestation	No depression				Depression			
	Pre-test	Post-test	t test	P value	Pre-test	Post-test	t test	P value
HR	85.2 (±13.1)	95.4 (±15.4)	3.44	P<0.001	92.3 (± 12.8)	111 (±16.2)	6.14	P<0.001
RR	19.5 (±2.96)	27.5 (±4.4)	10.2	P<0.001	20 (±2.88)	30.2 (±5.4)	11.2	P<0.001
SPO_2	96.4 (±1.15)	95.8 (±5.10)	3.31	P<0.002	96.4 (±2.57)	94.5 (±2.7)	3.77	P<0.002
BORG score Dyspnoea	0.1470 (±0.43)	1.6 (±1.3)	7.08	P<0.001	0.33 (±0.67)	2.62 (±1.6)	8.77	P<0.001
BORG score leg fatigue	0	0.57 (±1.36)	0	0	0	1.26 (±1.72)	2.41	P<0.001
Leg cramp	0	3 (±4.81)	0	0	0	12 (±24.4)	2.40	P<0.02
Need to stop	0	4 (±8.61)	0	0	0	7 (±13.6)	1.26	p>0.21
6 MWD	0	428(±75.28)	0	0	0	41.72(±89.5)	0.99	p>0.32

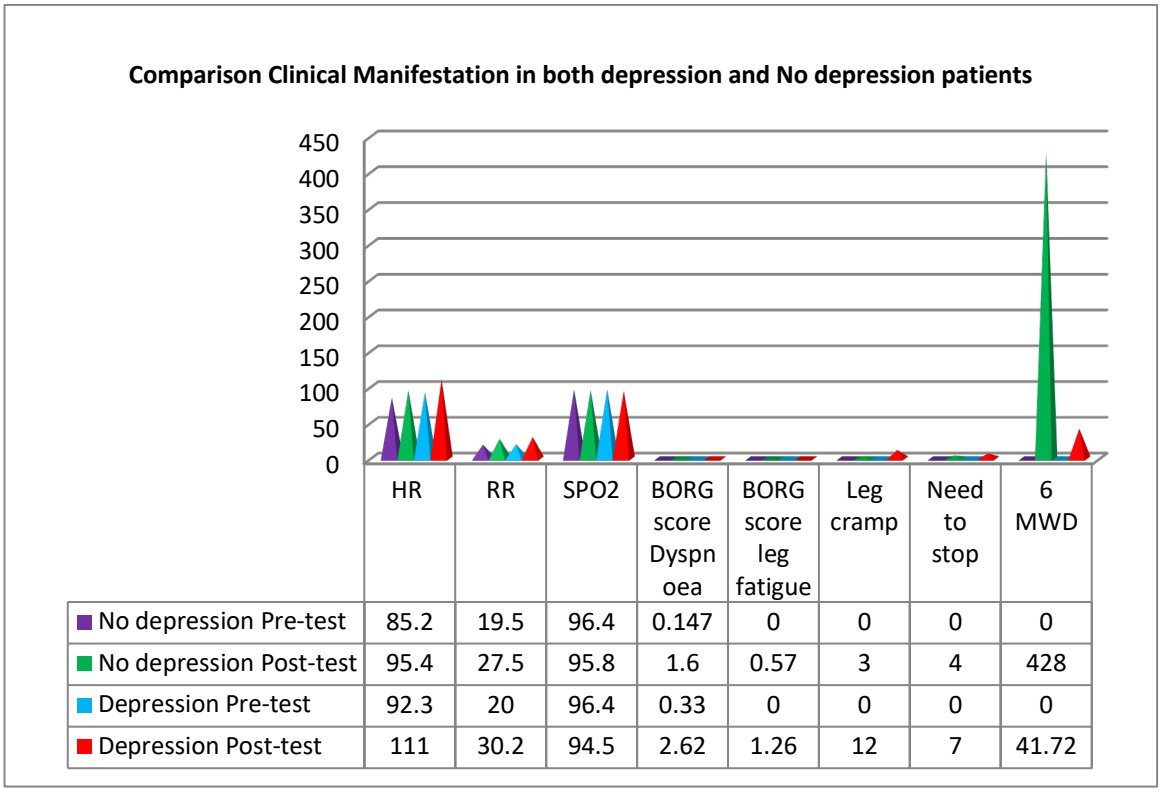

Figure 3: Comparison Clinical Manifestation in both depression and No depression patients

Discussion

In the present study of anxiety and depression in COPD patients in Maharashtra, 14 (14.7%) had anxiety, 30 (31.5%) had no anxiety, 49 (46.3%) had no depression, and 51 (53.6%) had depression (Table 1). In comparison of MI, smoking index, FEV1 + pred. CCQ score, HAM-D scale, and 6 MWD in no depression and depression had a significant p value (p<0.001) (Table 2).

Similarly, the comparison of clinical manifestations between no depression and depression patients (HR, RR, SPO2, RROG score, dyspnea, leg cramp) had a significant p value (p<0.001) (Table 3). These findings are more or less in agreement with previous studies [7,8,9].

Anxiety and depression are well known to be associated with COPD because such patients seek other ways to dissipate their psychological stress and resort Anxiety and depression are well known to be associated with COPD because such patients seek other ways to dissipate their psychological stress and resort to "smoking." In such cases, smoking is detrimental to COPD, and the vicious cycle continues to worsen the prognosis.

Treating the anxiety and depression in such patients includes the treatment of COPD as well. However,

the association of these psychic COPD is a clinical challenge because the mechanism of depression and anxiety in COPD is still not completely understood, as the relationship is complex [10]. The biological mechanism between COPD and depression is still unknown. Interestingly, these two disorders are considered heritable. The estimated genetic heritability for COPD is 25–37%, and that for major depressive disorder (MDO) is 25–51%. Forced expiratory volume in one second (FEV1) and forced vital capacity (FVC) are also heritable factors that have an estimation of 18–50% (11).

One possible suspected mechanism relating to depression and COPD is the "over pill theory, where it is suspected that inflammatory markers spill over into the general circulation, causing systemic inflammation. In this light, markers such as STNFR-1 (soluble tumour necrosis factor alpha receptor-1) have shown a strong association with depression rates in patients with COPD (12). This factor indicates COPD could be a risk factor for depression.

The other proposed mechanism is smoking and hypoxemia, which also affect the mental health of COPD patients. Anxiety and panic attack symptoms are also seen in patients with COPD. COPD patients with persistent hypercarbia are at increased risk of such dyspneic spells and become more susceptible to anxiety attacks. The depressive symptoms of COPD are associated with an increased risk of mortality in both hospitalised and outpatient patients [13]. The impact of non-adherence to COPD therapies leads to higher hospitalisation rates and costs, as well as increased emergency department visits. The pharmacological options for treating depression and anxiety in COPD patients are tricyclic anti-depressants (TCA's), selective serotonin reuptake inhibitors (SSRI's).

Summary and Conclusion

Present study of anxiety and depression in COPD patients These patients carry a higher risk of mortality than COPD patients without these co-morbidities. COPD patients with anxiety or depression benefit from pulmonary rehabilitation. CBT and cautious use of anti-depressants, active investigation, and research are necessary for adequate and effective screening and management of anxiety and depression in COPD patients to decrease their negative impact on quality of life and to reduce readmission and mortality rates because the exact pathogenesis of COPD is still unclear.

Limitation of study: Owing to the tertiary location of the research centre, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

This research work has been approved by the ethical committee of MIMSR Medical College, Latur (413531), and Maharashtra.

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