ORIGINAL ARTICLE

A Cross Sectional Study to Assess the Levels of Depression and Anxiety in Patients with Chronic Obstruction Pulmonary Disease in a Tertiary Care Hospital

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Abstract

Objective: In the present study, demographic profile, knowledge and motivation of COPD patients attending tertiary hospital, the level of anxiety and depression is assessed. **Materials and Methods**: This cross-sectional study was carried out on consecutive patients with COPD during their routine out- and in-patient visits in the tertiary care hospital during 4 months (April 2019 to July 2019). Physician confirmed cases of more than 1-year duration were included in the study. Thus 194 COPD patients were admitted in the ward. They were interviewed by using HADS scale and Modified Morisky scale. The diagnosis of COPD was confirmed by Chest X- ray and Spirometery test and a history of exacerbation or hospitalization over past 6 months was also obtained. The chi square-test, t-test and one-way analysis of variance were used in the univariate analyses, whilst regression was used in the multiple variable analyses. **Results**: A total of 194 COPD individuals, 124 Males and 70 Females were enrolled in the study. The mean age of the respondents was 49.16 ± 8.20 (25-62) years. The mean scores for anxiety and depression were 19.12± 2.38 and 11.54± 2.50 respectively. Both anxiety and depression scores were statistically significant between the gender. Among males 70 % cases were having no comorbid conditions; however, 57.10 % females were having more than two comorbid conditions. **Conclusion**: Present study illustrates that anxiety and depression are common in patients with COPD, furthermore, patients with depressive disorders have more comorbidities in comparison with patient with anxiety.

Keywords

Depression; COPD Patients; Anxiety

Introduction

Chronic obstructive pulmonary disease (COPD) is a leading respiratory disease affecting globally with great potential of affecting the quality of life. The World Health Organization defines it as a lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible.(1) According to GOLD guidelines it is a progressive and partially reversible obstruction of air flow related to lungs' abnormal inflammatory

response to gasses and different poisonous particles.(2)

It is a preventable and treatable illness and is one of the leading non-communicable causes of death globally, as well as in India.(3,4,5) Globally 210 million people are affected and kills > 4 million people every year, accounting for around 9% of total deaths. Usually low- and middle-income countries are affected accounting for ninety percent of these deaths. According to the World Health Organization report, the prevalence of COPD ranges between 4% and 20% in the Indian adults. It is predicted to become the third leading cause of death by 2030.(6,7,8)

COPD is a major cause of chronic morbidity; it was ranked 11th in 2002 and is projected to rise to seventh place in 2030.(9) Chronic obstructive pulmonary disease (COPD) is associated with impaired daily activities, reduced HRQoL, severe dyspnoea, and psychological burden of clinically relevant anxiety or depression.(10)

Patients of COPD are at a considerable risk of suffering from symptoms of depression and anxiety.(11,12) The prevalence of anxiety symptoms varied from 30 to 90%, and that of depressive symptoms ranged from 13 to 70% among COPD patients.(13-19) It is well documented that patient of COPD experiences significantly more psychological distress than the general population and significantly less than psychiatric outpatients.(20) To maximize QoL in patients with COPD, psychological factors need to be carefully assessed and addressed.(21)

The association between depression and COPD appears to be bidirectional, as shown in a recent meta-analysis of longitudinal studies which demonstrated that not only COPD increases the risk of developing depression (relative risk 1.69; 95% CI 1.45-1.96) but also, depression increases 1.43 (95% CI 1.20-1.71) the risk of COPD adverse outcomes and mortality.(22) Although depression and anxiety are significant co-morbid condition in chronic illnesses, little is known about its level in patients with chronic obstructive pulmonary disease (COPD) in India.

Aims & Objectives

1. To assess the demographic profile, knowledge and motivation of COPD patients attending tertiary hospital.
2. To assess the level of anxiety and depression among COPD patients.

Material & Methods

Study type: Cross sectional study

Study population & Study area: This cross-sectional study was carried out on consecutive patients with COPD during their routine out- and in-patient visits in our tertiary care hospital.

Study duration: The study was carried out for four months (April 2019 to July 2019).

Methodology: In order to be included in the study, the patient had to present with physician confirmed diagnosis of COPD >_1 year (by using the GOLD guideline with post bronchodilator FEV1/FVC<70). The patient should be less than 60 years and was on medication for depression and anxiety both. Two hundred and sixteen patients attending our respiratory unit were screened; twenty-two met with exclusion criteria and remaining 194 were enrolled. The levels of anxiety, depression, dyspnoea and treatment adherence were assessed in all cases using a self-administered semi structured questionnaire (in Hindi). We used Hospital Anxiety and Depression scale (HADS) to assess anxiety and depression, which contain 14 items in two subscales: anxiety (HADS-A) and depression (HADS-D), each with seven items (23). Approval from the Institutional Ethical committee was taken and written informed consent was obtained from the patients.

Variables in the study are as follows:

1. Severity of Dyspnoea -The modified medical resource council (MMRC) dyspnea scale was used. It consisted of five statements about perceived breathlessness: from grade 1(I only get breathlessness with strenuous exercise) up to grade 5 (I'm too breathless to leave the house) (24).
2. Patient adherence can be defined as the extent to which a patient's behavior coincides with health-related advice, the ability to attend scheduled clinical appointments, make optimal life style changes, undergo recommended investigations and take medications as prescribed. Modified Morisky's Scale 6 item questionnaire is used to assess the adherence to the medications prescribed for COPD (25).
3. Number of comorbidities (diagnosed by a physician).

Data analysis: Data was entered in MS Excel; Data coding and analysis was conducted using Statistical Package for Social Sciences (SPSS) version 22.

Demographics and clinical characteristics were compared among the groups using cross tabulation and chi square tests or Fisher exact test. Student t test, Analysis of variance, Kruskal–Wallis and Wilcoxon tests are applied, depending on the normality of the data. Logistic regression was used to explore the severity of anxiety and depression. Age at marriage, gender, education level, occupation type, comorbidities, addiction, duration of disease, patient adherence, were considered as independent variable. Severity of Dyspnoea, BMI. P value of < 0.05 was considered as statistical significance

Results

Total numbers of respondents were 194 (Male/ female: 124/70). The overall mean± SD age of all patients was 49.17 ± 8.29 (25-62) in years. Most of them were skilled by occupation (79.4) and married (85.6). In terms of educational status, only 16.5 % were educated up to intermediate. The majority of male respondents had history of alcohol and smoking consumption, i.e., 77.2% and 58.2% respectively. It was observed that 113 (58.2%) respondents had no associated comorbidities. The severity of dyspnoea was almost equal in male and female and found not to be significant, though the average score of anxiety and depression was statistically different in both the groups (p<0.05). Significant difference was observed between disease duration and gender (p=0.031). More than half of the patients had high knowledge and motivation regarding treatment adherence for COPD, also knowledge was significantly associated with gender. The mean scores for anxiety and depression were 19.77± 2.15 and 19.13± 2.39 respectively. Both anxiety and depression scores were statistically significant between the gender. Female with COPD were severely anxious and depressed and it was found to be significant. Number of comorbidities and history of alcohol consumption were also found to be statistically significant (p<0.05).

(Table 1) reveals the characteristics of anxiety and depression of the study population. Gender, Educational status and BMI were significantly correlated with levels of anxiety and depression both. However, the age, marital status, number of comorbidities, alcohol use and motivation were statistically significant with level of depression (p <0.05).

After adjustment for covariates, female patients were more likely to suffer from severe anxiety and depression (OR = 4.536, 95% CI: 1.806-11.395), (OR = 3.160, 95% 1.716-5.820) (p<0.01) respectively. Depressive patients had a higher risk of anxiety (OR = 1.430, 95% CI: 1.214-1.685) (p=0.000). Similarly, anxious patients were more prone to be depressive (OR = 1.605, 95% CI: 1.354-1.903) (p=0.000). BMI and alcohol use were significantly associated with an increased risk of depression (OR = 1.747, 95% CI: 1.021-2.899) (OR = 1.939, 95% CI: 1.090-3.450). Number of Comorbidities and Marital status were also found to be significantly linked to the severe depression (Table 2).

Discussion

COPD is a chronic and progressive disease which is usually caused by smoking which begins in adolescence age group and takes 20-25 years of exposure to induce characteristic pathophysiological changes in lungs of human beings. It takes several years to develop and it affects mostly older adults and however middle age people can also be affected because of their lifestyle.

Another important factor is domestic exposure of indoor pollution, resulting from burning solid biomass, other health-adverse fuels and usage of mosquito coil has emerged as another important risk factor for COPD. It has been observed that the exposure begins during early infancy and childhood, thus young adults were more susceptible for development of COPD at an early age. In humans, the lung function keeps improving until early adulthood and subsequently undergoes a natural physiological decline.

Therefore, we wish to estimate the demographic profile, level of anxiety and depression in COPD patients. It has been observed in this study that the overall mean± SD age of all patients was 49.17 ± 8.29 (25-62) years. Similarly Kristen E. Holm, et al observed that the mean baseline age of COPD was 60 years and the age range varies from (32-84) in his study (26) Another author MizuhaHaraguchi et al observed that the mean age of patient in his study was 72.6 ± 8.2, however the range was between 43-91 years.(27)

COPD is rapidly becoming a global public health problem with smoking being recognized as its most important causative factor, various studies have shown that the combination of smoking and heavy drinking makes COPD worse.

In this study patients smoking rate among COPD patient was less 28.4 % as compared to study

conducted by Lundback et (28) al in which it was more i.e 50 %. It has been observed that 58.2 % males and 41.8% females had a history of smoking however similar study conducted by Karadogan (29) observed that 50 % males and 33.3% females had history of smoking (dilek), while the general recent smoking prevalence among individuals older than 40 years in Turkey (30) was approximately 40% among men and 13% among women.

It has been observed that majority (77.2%) of the male respondents had a history of alcohol in this study, Contrary to our findings Kaluza J et al (31) observed that Moderate alcohol consumption was associated with the lowest risk of COPD, suggesting that moderate beer and wine consumption, but not liquor consumption, may decrease risk of COPD.

Dyspnea is one of the leading symptoms and sometimes the only one affecting patient suffering from COPD. Functional dyspnea has been shown to be a strong predictor of survival and an important treatable symptom of the disease. (32,33)

In our study the mean of MMRC Score was 3.16±1.28 similar to this TaghreedS et al (34) observed that in his study MMRC score was 3.26±0.74 .

In our study it has been observed that severity of dyspnea was almost equal in males and females. Similarly study by GuohuaJia observed that women rated MMRC dyspnea score was similar to men (1.74±1.10 vs 1.70±1.11, p≤0.05). (35) However, another author de Torres (36) observed that women with COPD reports more functional dysnpea for the same degree of airway obstruction.

Female patients reported a higher level of dyspnea than males for the same level of ventilatory impairment. Dyspnea was more strongly correlated with depression in women than in men. (37)

COPD is considered as a systemic disease with multiple co morbidities. Anxiety and depression are considered two of the most common and least-treated comorbidities associated with it. A heightened experience of dyspnoea is likely to be a contributing factor to anxiety.

Average score of anxiety and depression were almost equal in our study and it was found to be statistically significant (p≤ 0.008, p ≤0.005) however another author Amira H et al (38) observed that in COPD group, anxiety and depression were more prevalent in males with highly significant statistical differences for anxiety between males and females (p .004) and non-significant differences for depression.

In this study prevalence of anxiety was 18.77 and depression was 11.18 however in a study done by Amira H. et al (38) observed increased prevalence of anxiety and depression in COPD (22%, 14%).

The prognosis of chronic diseases in patients of chronic health conditions depends of treatment adherence which plays and important role in failure of treatments, increased risk for disease recurrence and its exacerbation, prolongation of treatment and increased health cost. (39)

In this study level of education, age and BMI were significantly associated with anxiety and depression similarly study by Negietal (40) observed that Lower educational status was associated with higher score of depression severity (beta= -1.566, P<0.01). Higher BMI was associated with lower score of depression in patients with COPD (beta= -0.779, P<0.01), however no association was found with age and sex

In our study females' patients have suffered more from anxiety (OR= 4.536, 95% CI :1.806-11.395), and depression (OR 3.16. 95 %1.716-5.820), similarly study by Tian Xiao (41) also observe that after adjustment for covariates, female patients were more likely to suffer from anxiety (aOR = 6.41, 95% CI: 1.73-23.80) and depression 1.48(0.69~ 3.19) in his study.

Conclusion

In conclusion, a substantial number of patients with COPD had both depression and anxiety and it is observed that depression was more common in unmarried females, patients with co morbidities and with high BMI. Therefore, detection of psychological co-morbidities should be emphasized in routine clinical practice in COPD patients.

Recommendation

It is recommended to conduct a stress management seminar at regular interval for COPD Patients.

Limitation of the study

The number of subjects enrolled in our study were less, we were not able to follow up the cases. It was a hospital-based study done in single hospital setting thus its results cannot be generalized for the community.

Relevance of the study

The study will be useful for policy makers, clinicians to plan the special clinics for COPD Patients on their felt needs. The strength of the study is that it is first of its kind being done in Dehradun, capital of Uttarakhand.

Authors Contribution

All authors have contributed equally.

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Tables

TABLE 1 CHARACTERISTICS OF COPD PATIENTS ACCORDING TO ANXIETY OR DEPRESSION STATUS

Characteristics	Anxiety			p- value	Depression			P – value
	Minimal	Mild	Moderate		Minimal	Mild	Moderate	
Age	51.46±5.24	50.91±7.57	48.63±8.57	0.238	49.32±7.67	51.35±6.55	47.8±19.27	0.048
Gender								
Male	10(8.1)	27(21.8)	87(70.2)	0.003	39(31.5)	40(32.3)	45(36.3)	0.001
Female	1(1.4)	5(7.1)	64(91.4)		13(18.6)	12(17.1)	45(64.3)	
Occupation								
Skilled	9(5.8)	26(16.9)	119(77.3)	0.933	43(27.9)	39(25.3)	72(46.8)	0.613
Unskilled	2(5.0)	6(15.0)	32(80.0)		9(22.5)	13(32.5)	18(45.0)	
Marital Status								
Married	11(6.6)	27(16.3)	128(77.1)	0.373	51(30.7)	44(26.5)	71(42.8)	0.007
Unmarried	0(0.0)	5(17.9)	23(82.1)		1(3.6)	8(28.6)	19(67.9)	
Education Status								
No schooling	8(16.3)	7(14.3)	34(69.4)	0.002	15(30.6)	0(0.0)	34(69.4)	0.000
Primary	0(0.0)	0(0.0)	32(100.0)		17(53.1)	5(15.6)	10(31.3)	
Secondary	1(3.2)	5(16.1)	25(80.6)		12(38.7)	11(35.5)	8(25.8)	

High school	1(1.9)	13(24.1)	40(74.1)		7(13.0)	18(33.3)	29(53.7)	
Intermediate	1(3.6)	7(25.0)	20(71.4)		1(3.6)	18(64.3)	9(32.1)	
Number of Comorbidities								
0	7(6.2)	21(18.6)	85(75.2)		35(31.0)	28(24.8)	50(44.2)	
1	2(4.3)	9(19.6)	35(76.1)		13(28.3)	17(37.0)	16(34.8)	
2	2(6.3)	2(6.3)	28(87.5)	0.654	4(12.5)	7(21.9)	21(65.6)	
3	0(0.0)	0(0.0	3(100.0)		0(0.0)	0(0.0)	3(100.0)	0.044
Smoking								
Yes	3(5.5)	12(21.8)	40(72.7)	0.453	13(23.6)	15(27.3)	27(49.1)	
No	8(5.8)	20(14.4)	111(79.9)		39(28.1)	37(26.6)	63(45.3)	0.813
Alcohol Use								
Yes	8(9.1)	14(15.9)	66(75.0)	0.172	33(37.5)	22(25.0)	33(37.5)	0.007
No	3(2.8)	18(17.0)	85(80.2)		19(17.9)	30(28.3)	57(53.8)	
Knowledge								
Low	2(2.8)	10(14.1)	59(83.1)	0.301	20(28.2)	15(21.1)	36(50.7)	0.392
High	9(7.3)	22(17.9)	92(74.8)		32(26.0)	37(30.1)	54(43.9)	
Motivation								
Low	2(3.1)	7(10.9)	55(85.9)	0.158	24(37.5)	11(17.2)	29(45.3)	0.025
High	9(6.9)	25(19.2)	96(73.8)		28(21.5)	41(31.5)	61(46.9)	
BMI	20.32±3.65	21.87±1.63	18.76±1.90	0.044	19.64±2.44	20.98±2.38	17.85±1.22	0.001
Disease duration	6.55±4.34	5.19±3.62	5.61±3.93	0.607	6.60±3.91	5.56±3.76	5.03±3.89	0.070
MMRC	2.72±1.62	3.12±1.29	3.13±1.35	0.621	2.80±1.33	3.15±1.36	3.26±1.29	0.148

TABLE 2 RISK OF ANXIOUS AND DEPRESSIVE SYMPTOMS IN PATIENTS WITH COPD

Factors	Anxiety (Mild, Moderate Vs Severe)			Depression(Mild, Moderate Vs Severe)		
	Odds Ratio	95% (CI)	p	Odds Ratio	95% (CI)	p
Age	0.960	0.915-1.007	0.096	0.963	0.930-0.998	**0.037**
Female	4.536	1.806-11.395	**0.001**	3.160	1.716-5.820	**0.000**
Education Level	0.875	0.315-2.429	0.798	0.408	0.157-1.063	0.067
Unskilled Worker	1.176	0.497-2.784	0.712	0.932	0.463-1.874	0.843
Unmarried	1.366	0.486-3.835	0.554	2.825	1.207-6.613	**0.017**
Comorbidities	1.446	0.908-2.302	0.120	1.454	1.020-2.072	**0.039**
Smoking	1.487	0.721-3.066	0.283	0.860	0.460-1.607	0.635
Alcohol Use	1.349	0.684-2.660	0.387	1.939	1.090-3.450	**0.024**
Duration of COPD	0.931	0.863-1.004	0.065	1.005	0.921-1.097	0.912
Knowledge_ High Level	0.604	0.287-1.268	0.183	0.761	0.424-1.367	0.361
Motivation _ High Level	0.462	0.206-1.034	0.060	1.067	0.585-1.946	0.833
MMRC	1.064	0.825-1.373	0.634	1.171	0.944-1.452	0.151
BMI	0.895	0.765-1.047	0.165	1.747	1.021-2.899	**0.002**
Depression	1.430	1.214-1.685	**0.000**			
Anxiety				1.605	1.354-1.903	**0.000**