Proportion of depression in stable COPD patients and relationship between depression and health related quality of life

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Abstract---Background: Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality worldwide and predicted to be the third cause of death in world in 2020. Nearly half of all chronic obstructive pulmonary disease patients, suffer psychiatric disorders such as depression and anxiety and these disorders have impact on quality of life remains poorly understood .The aim of the study is to assess the proportion of depression and its relation to quality of life in patients with COPD. Materials And Methods: A prospective cross-sectional study of 55 patients enrolled for study .All consecutive patients with COPD are assessed during their routine outpatient visit in Department of pulmonary medicine. The grouping of patients is based on 2011 Global initiatives for chronic obstructive lung disease (GOLD) classification system. The depression among COPD patients assessed by Patient health questionnaire-9(PHQ-9) and the quality of life by using St. George's respiratory questionnaire and Medical research council questionnaire was used to assess the severity of dyspnoea. Socio-demographic data regarding the patients were also recorded. Results: Proportion of depression in this study found 30.9%. Mean symptoms score, activity score, impact score and total score of SGRQ in depressed patients were 55.04, 67.20, 53.33, and 57.8 respectively. Mean symptoms score, activity score, impact score and total score of SGRQ in not depressed patients were 32.5, 44.6, 30.9 and 35.3 respectively. T- test was done to compare means between the group depressed and not depressed. P value of all scores were <0.05. Conclusion: This study showed that the proportion of depression among COPD patients is

30.9%. This study found significant reduction in HRQL in patients with depression compared with patients without depression.

Keywords---chronic obstructive airway disease, depressive symptoms, life quality.

Introduction

Chronic obstructive pulmonary disease (COPD) is a common preventable and treatable disease. COPD is characterised by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response usually progressive and associated with an enhanced chronic inflammatory response in the airway and the lung, due to noxious particles or gases[1]. COPD is a disease with multiple comorbidities and the least treated comorbidities are Anxiety and Depression[2]. COPD has been associated with reduced functional capacity, increased hospitalization, and exacerbation leading to poor quality of life[3]. Depression is a better predictor of reduction in activities of daily living than forced expiratory volume in 1 second (FEV1). QOL is an important domain for measuring the impact of chronic disease and severity in patients with COPD[4]. Depression has been affiliatedwith low quality of life. In Chronic illness where depression is co morbidity, quality of life contribute to be adequate lower.[3] there is a still gap of knowledge regarding the proportion of depression among patients with COPD in different parts of India. The aim of the study is to assess the proportion of depression and its relation to quality of life in patients with COPD in Goa.

Materials and Methods

This prospective cross-sectional study was carried out from May 2012 to December 2013 at Goa Medical College, Department of pulmonary medicine. All consecutive patients with COPD attending chest outpatient clinic, who met the inclusion criteria, age more than 40 years, Exsmoker or current smoker with a smoking history of more than 10 pack years, ratio of forced expiratory volume in one second (FEV1) and Forced expiratory volume greater than and equal to 200 ml and 12% after 200mg of Salbutamol inhalation. The exclusion criteria were the patients with prior history of psychiatric disease or subjects with other chronic systemic illness like malignancy, diabetes mellitus, and coronary artery disease, renal or hepatic disease. The study protocol was approved by the institutional ethics committee. Written informed consent was obtained from each participant prior to study.

Demographic data

General characters such as age, sex, marital status, smoking status (current or ex-smoker) were recorded. Subject weight and height were measured before carrying out pulmonary function tests and the body mass index (BMI) was calculated by dividing the weight in kilograms by height in meters squared. Cigarette smoking was defined as having smoked at least 100 cigarettes in one's

lifetime. Ex-smoker was defined as a person who stopped smoking for more than one year

Diagnosis and severity of COPD

The Spiro metric measurements (FVC, FEV1 and FEV1/FVC) and bronchodilator responses were performed in sitting position as per the American Thoracic Society guidelines[5]. The diagnosis and staging of COPD were in accordance with the GOLD guidelines, and the criteria included a post-bronchodilator ratio of forced expiratory volume in 1s (FEV1)/forced vital capacity of <70%, reversibility of decrease in FEV1 after bronchodilator administration of <200 mL or <12% and GOLD stage I (%FEV1 > 80), GOLD stage II (%FEV1: 50–79), GOLD stage III (%FEV1: 30–49) or GOLD stage IV (%FEV1 < 30) COPD[6].

Assessment of depression

The Patient Health Questionnaire-9 (PHQ-9) is a nine-item measure that emulates the DSM-IV and is useful for making a diagnosis of depression, assessment of severity and monitoring response to treatment. In this study depression is diagnosed if PHQ-9 score ≥10 and nondepressed if score <10. As a severity measure, the PHQ-9 score ranges from 0 to 27, because each of the 9 items can be scored from 0 ("not at all") to 3 ("nearly every day"). Cut points of 5, 10, 15, and 20 represent the thresholds for mild (5-9), moderate (10-14), moderately severe (15-19), and severe (≥20) depression respectively[7]. Hindi, Marathi and English translations of PHQ-9 was self-administered to literate patients. For illiterate patients, help was sought from either relative or paramedical workers to read out the questionnaire and to record the responses.

Assessment of quality of life

Respiratory symptom burden and physical and social functioning status were measured using the SGRQ. The SGRQ is one of the frequently used disease-specific HRQoL instruments, and it measures the impact of respiratory disease on HRQoL in patients with chronic respiratory disease. The SGRQ has been validated as a useful tool to evaluate the status of patients with COPD. The SGRQ is composed of a questionnaire with 76 weighted items, with the patient's symptoms, activity and disease impact on daily life as the three main components evaluated. The responses to the 76 questions can be aggregated into a total score, as well as three sub-scores for the symptoms (respiratory symptoms), activity (physical activities that cause or are limited by breathlessness) and impact (social and psychological effects of the disease). The eight items comprising the symptom component assess the frequency of cough, sputum production and dyspnoea or wheeze. The 16 items in the activity component identify physical activities that induce dyspnoea or that are affected by dyspnoea. The 26 items in the impact component broadly assess the impact of the disease on different aspects of social and emotional functions and expectations for health. Scores range from 0 (best) to 100 (worst). The higher the total or individual component SGRQ score, the poorer the quality of life for the patient[8].

Assessment of dyspnoea

Dyspnoea was measured using the Medical Research Council (MRC) dyspnea scale. The MRC dyspnoea scale classifies breathlessness into six grades (0 to 5) according to self-perceived breathlessness during daily activities[6].

Statical Analysis

Proportion of depression among COPD patients were calculated by dividing number of depressed patients from total number of patients. SGRQ scores among depressed and nondepressed were compared with student's T-test. SPSS for windows version 17 was used for analysis. All the values were expressed as mean +/- Standard Deviation (SD). A probability value of P <0.05 was regarded as statistically significant.

Results

Characteristics	Depressed	Not depressed	Total
Sex			
Males	16 (31.4%)	35 (68.6%)	51 (92.7%)
Females	1 (25%)	3 (75%)	4 (7.3%)
Age			
45-54	3 (37.5%)	5 (62.5%)	8 (14.5%)
55-64	7 (31.8%)	15 (68.2%)	22 (40%)
≥65	7 (28%)	18 (72%)	25 (45.5%)
Smoking habits	13 (27.7%)	34 (72.3%)	47 (85.5%)
Ex-smoker	4 (50%)	4 (50%)	8 (14.5%)
Current smoker			
Smoking index	7 (25.9%)	20 (74.1%)	27 (49.1%)
<20	6 (30%)	14 (70%)	20 (36.4%)
20-50	4(57.1%)	3 (42.8%)	7 (12.7%)
50-100	0	1 (100%)	1 (1.8%)
>100			
Bodymassindex (BMI)	7 (23.3%)	23 (76.7%)	30 (54.5%)
<18.50	8 (38.1%)	13 (61.9%)	21 (38.2%)
18.50-24.99	2 (66.7%)	1 (33.3%)	3 (5.5%)
25-29.9	0	1 (100%)	1 (1.8%)
≥30			
mMRC Dyspnoea scale Grade-1	8 (22.2%)	28 (77.8%)	36 (66.5%)
Grade-2	7 (43.8%)	9 (56.2%)	16 (29.1%)
Grade-3	2 (66.7%)	1 (33.3%)	3 (5.5%)
Grade-4	0	0	0

Table No: 1 Proportion of depressed and not depressed according to Sex, Age, Smoking habits, Smoking index, BMI, mMRC dyspnoea.

PHQ-9	Stage-1	Stage-2	Stage-3	Stage-4
Patients with depression	0	6 (23.1%)	9 (42.9%)	2 (50%)
Patients without depression	4 (100%)	20 (72.9%)	12 (57.1%)	2 (50%)
Total	4 (7.3%)	26 (47.3%)	21 (38.2%)	4 (7.3%)

Table No: 2 Proportion of depressed and not depressed individuals in different stages of COPD

SGRQ	Stage-1 (n=4)	Stage-2 (n=26)	Stage-3 (n=21)	Stage-4 (n=4)
Symptoms score	14.5	37.6	44.6	47.3
Activity score	22.3	47.8	58.4	69.9
Impact score	13.8	35.8	41.3	55.8
Total score	16.4	39.9	47	58.8

Table No: 3 Trend of mean SGRQ scores throughout the severity of COPD

SGRQ parameters	Depressed (PHQ-9 score ≥ 10)	Non-depressed (PHQ-9 score <10)	P value
SGRQ-Symptoms (mean± SD)	55.04± 25.1	32.5± 25.9	0.004
SGRQ-Activity (mean± SD)	67.2± 14.5	44.6± 25.1	0.001
SGRQ-Impact (mean± SD)	53.33± 20.6	30.9± 19.0	<0.001
SGRQ- Total (mean± SD)	57.82± 16.3	35.3± 19.8	<0.001

Table No: 4 Comparison of mean SGRQ scores between the patients with depression and notdepression in COPD
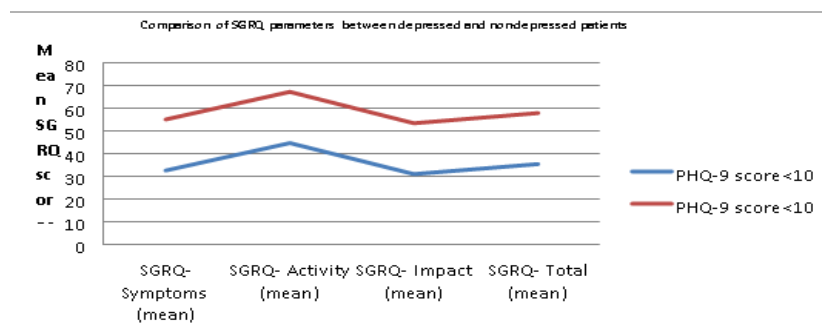

Fig No: 1 Comparison of mean SGRQ scores between the patients with depression and not depression in COPD.

Discussion

COPD is a major disease affecting millions of people around the world. Its prevalence of is rising particularly in the developing countries. Co-morbid psychiatric illness accompanied with COPD is a big challenge in the management

of COPD. The presence of unrecognized depression in patients with COPD, may increase over all morbidity of this disease. The objectives of this study were to describe the proportion of depression in patients with stable COPD, and to determine whether the presence of depression is associated with greater impairment in health-related quality of life (HRQoL).

Several screening tests are available to diagnose depression in primary care settings. Overall sensitivity and specificity of these tests to detect depression are 84% (95% confidence interval [CI], 79% to 89%) and 72% (95% CI, 67% to 77%), respectively and, there are no significant differences between the screening tests[9]. The PRIME-MD is highly sensitive and has a reasonably good positive predictive value for screening for anxiety and depression, and this test is useful and an easily administered tool for primary care physicians [10]. The PHQ-9 diagnostic validity and symptom severity with clinician-detected severity have a good correlation (0.84)[11].

A total of 55 patients were included in this study and 17 patients among them were diagnosed to have depression. Prevalence estimates vary widely, due in part to the use of varied measurement tools and to the different degrees of illness severity across studies. In stable COPD, the prevalence of clinical depression ranges between 10% and 42%[12]. One large study[13] from urban area of south India had reported the prevalence of depression is 25.7% among population of more than 60 years of age. The proportion of depression in current study found to be 30.9%. So proportion of depression in this study is higher than general population in India. This report is consistent with studies done by, Gudmundssonet al[14] which found depression in 29% of patients based on HADS score, Carvalho et al[15] reported a prevalence of 29% based on BDI score and Dowson et al[16] reported a prevalence of 28% based on HADS score.

In this study there were 51 males and 4 females. Proportion of depression among male patients was 31.4% and in females were 25%. Lou et al foundproportion depression among male patients as 34%. We have got a low proportion among female patients compared to Lou et al (44%)[17] and Van Manen et al (30%)[18]. This finding may be due to less number of female patients in our study and less prevalence of smoking among Indian female population. Mean age of depressed patients in current study is 63.18 year. Study done by Light et al[19] showed mean age among depressed patients as 62.4 year. In this study we have got a proportion of depression 37.5% in 45-54 age group, 31.8% in 55-64 age group and 28% in >60 age group. So there is no increased proportion of depression as age increases.

In this study there is higher proportion of depression among current smokers (50%) than exsmokers (27.7%). This finding consistent with study done by Khaled et al[20] which showed higher prevalence of depression among current smokers. This study found 25.9% depression in patients with smoking index of <20, 30% depression in patients with smoking index of 20-50, 57.1% depression in patients with smoking index of 50-100. Mean pack year of smoking among depressed patients is 36.7 and among non-depressed patients are 28.8. So there is increased proportion of depression as severity of exposure to tobacco smoke increases.

Out of 55 patients 30 (54.5%) patients were underweight, 21 (38.2%) patients were with BMI 18.50-24.99, 3 (5.5%) patients were with BMI 25-29.99 and 1 (1.8%) were with BMI ≥30. Proportion of depression in underweight patients were 23.3%, in patients with BMI 18.50-24.99 were 38.1%, in patients with BMI 25-29.99 were 66.7% and no depression in patients with BMI ≥30. There is no increased depression in patients with low BMI compared to patients with high BMI.

Out of 55 patients 36 (66.5%) were with MMRC dyspnoea grade 1, 16 (29.1%) were with MMRC dyspnea grade 2 and 3 (5.5%) were with MMRC dyspnoea grade 3. No patients were in MMRC dyspnea grade 4. Proportion of depression in patients with MMRC dyspnoea grade 1 was 22.2%, grade 2 was 43.8% and grade 3 was 66.7%. These findings show an increased proportion of depression as grade of dyspnoea increases. These findings are consistent with the study done by Lou et al[17] which showed depression associated with more dyspnoea (MMRC).

In current study among 55 patients, 4 (7.3%) patients were in stage-1of COPD, 26 (47.3%) were in stage-2, 21 (38.2%) were in stage-3 and 4 (7.3%) were in stage-4 of COPD. Proportion of depression in stage-1 COPD was 0, stage-2 were 23.1%, stage-3 were 42.9%, and stage-4 were 50%.Proportion of depression increases as severity of COPD increases. This finding consistent with study done by Manen V et al [21] which showed that patients with mild to moderate COPD severity are not at increased risk for depression but patient with severe COPD had 2.5 times higher risk of depression.

Mean symptoms score in stage-1, stage-2, stage-3, and stage-4 are 14.5, 37.6, 44.6 and 47.3 respectively. Mean activity score in stage-1, stage-2, stage-3, and stage-4 are 22.3, 47.8, 58.4 and 69.9 respectively. Mean impact score in stage-1, stage-2, stage-3, and stage-4 are 13.8, 35.8, 41.3 and 55.5 respectively. Mean total score in stage-1, stage-2, stage-3, and stage-4 are 16.4, 39.9, 47 and 55.8 respectively. So mean value of symptom, activity, impact and total scores of SGRQ increases as COPD stage progresses. These findings are consistent with study done by F. Di Marco et al[22] which showed worse HRQoL in patients with more severe disease.

In the present study, mean symptoms score, activity score, impact score and total score of SGRQ in depressed patients were 55.04, 67.2, 53.33 and 57.8 respectively. Mean symptoms score, activity score, impact score and total score of SGRQ in patients who are not depressed were 32.5, 44.6, 30.9 and 35.3 respectively. T-test was done to compare the means between the groups depressed and not depressed. P value of all scores were <0.05. So there is a significant reduction in HRQL in patients with depression compared with patients without depression. These findings are consistent with studies done by Quint et al[23] and Balcells et al[24], stated that the presence of depression seemed to decrease QOL when measured using the SGRQ, thus clearly indicating that depression is significantly related to QOL.

Improving HRQoL is an important current issue in COPD management. The usual interventions for improving HRQoL in COPD patients are medications (inhaled corticosteroids and bronchodilators), ambulatory oxygen, pulmonary

rehabilitation and lung volume reduction surgery[25]. Although depression has been considered as an important factor on HRQoL of COPD patients, it is frequently unrecognised and untreated, particularly when it coexists with physical illness. This often causes severe distress for patients who have mistakenly assumed that symptoms such as weakness or fatigue are because of an underlying medical condition. The recognition of depression in COPD patients is more challenging because of the significant overlap between the symptoms of depression and the COPD[26]. Therefore, all medical practitioners must be able to diagnose and manage depressive illness effectively. In the scope of public health, figuring out the prevalence of depression and its relationship with HRQoL should be a fundamental step in caring for the COPD patients.

Conclusion

The study was found that the proportion of depression among patients with COPD is 30.9%. Considering the magnitude of the problem of COPD worldwide, this percentage constitutes a large number of patients of depression among COPD patients. It is also observed that depressive symptoms increase with the progression of the stage of COPD. The study also found significant decrease in quality of life in depressed patients. This highlights the importance of routine screening for depression of all COPD patients in all healthcare settings and implementation of strategies for proper management and prevention of depression in those patients. Large scale studies should be conducted in India to estimate the prevalence of depression in COPD. Awareness regarding depression in COPD patients should be enhanced especially among the health care professionals. Above all, national management guidelines for depression among COPD patients should be developed and implemented.

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5644

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