

SUBJECTIVE ASSESSMENT OF DYSPNOEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ITS RELATION WITH ASSOCIATED DEPRESSION

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ABSTRACT

Background: COPD (Chronic obstructive pulmonary disease) is associated with many co morbidities and depression is one of them. Dyspnoea is an important factor determining the presence and degree of depression in COPD.

Aims & Objectives: To find the relation between increasing grading of dyspnoea and increasing grading of depression in COPD patients.

Materials and Methods: Fifty COPD patients diagnosed according to GOLD (Global initiative for chronic obstructive pulmonary disease) guidelines were recruited into study from the outpatient and inpatient department. Subjective assessment of dyspnoea was done by MMRC (Modified medical research council) dyspnoea scale. Assessment of depression was done by HAM-D scale (Hamilton rating scale for depression).

Results: A positive correlation was found between increasing grade of dyspnoea and increasing grade of depression in study population by finding the correlation coefficient ($p < 0.01$).

Conclusion: Study concluded that increasing grade of dyspnoea leads to increasing grade of depression in COPD patients. A detailed study is needed to understand the correlation between dyspnoea and depression in COPD patients for better understanding of the disease.

Key Words: Chronic Obstructive Pulmonary Disease (COPD); Dyspnoea; Depression; Modified Medical Research Council Dyspnoea Scale; Hamilton Depression Rating Scale

Introduction

Patients of COPD often have many comorbidities like cardiovascular disease, osteoporosis, diabetes mellitus, psychological disturbances, etc.^[1,2] Psychological disturbances particularly in the form of anxiety and depression are found in many COPD patients and their presence affects the quality of life (QoL) of these patients.^[3,4] To maximize QoL in patients with COPD, psychological factors need to be carefully assessed and addressed.

An association between COPD and depression has been proposed but definitive data supporting such a theory have previously not been provided due to the limited number of studies.^[5,6] So this study was designed with the objective to find the correlation between dyspnoea in COPD patients and its relation to accompanying depression. Finding of positive correlation between the above mentioned two variables was taken as endpoint.

Dyspnoea is the subjective experience – usually unpleasant – of discomfort with breathing.^[7] Dyspnoea is a cardinal symptom of chronic obstructive pulmonary disease (COPD), and its severity and magnitude increases as the underlying disease progresses, leading to significant disability. For patients with advanced COPD, dyspnoea profoundly affects quality of life (QoL). More

dyspneic patients are more likely to suffer from psychological comorbidities like depression and anxiety.^[8]

The Modified Medical Research Council (MMRC) dyspnoea scale has been in use for many years for grading the effect of breathlessness on daily activities.^[9] The MMRC dyspnoea scale is a questionnaire that consists of five statements about perceived breathlessness.^[10]

The Hamilton depression rating scale (HDRS), also known as the Ham-D, is the most widely used clinician-administered depression assessment scale. The original version contains 17 items (HDRS17) pertaining to symptoms of depression experienced over the past week. A later 21-item version (HDRS21) included 4 items intended to subtype the depression.^[11]

Materials and Methods

This prospective cross sectional study was carried out on consecutive COPD patients during their outpatient department visit and during their indoor stay in a tertiary care hospital in central Gujarat in India between November 2013 and April 2014. The subjects were recruited on the basis of written informed consent. The diagnosis of COPD was done on the basis of GOLD COPD

guidelines. Those who had history of depression or had other chronic systemic illness like malignancy, diabetes mellitus and coronary artery disease, renal or hepatic disease were excluded from the study. Patients were subjected to questionnaires based on MMRC scale, HAM-D scale and the results were recorded and analyzed.

The patients were classified by MMRC scale into following grades: grade 0, "I only get breathless with strenuous exercise"; grade 1, "I get short of breath when hurrying on the level or up a slight hill"; grade 2, "I walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at my own pace on the level"; grade 3, "I stop for breath after walking 100 yards or after a few minutes on the level"; grade 4, "I am too breathless to leave the house". Scoring in HAM-D scale is based on first 17 questionnaires. Score of 0 - 7 is considered "Normal", 8 - 13 is considered "Mild Depression", 14-18 is considered "Moderate Depression", 19 - 22 is considered "Severe Depression" and score of 23 or more is considered "Very Severe Depression".

Statistical Analysis

Data analysis was done using Microsoft excel worksheet and its formulae and by using calculator. Variables were presented as mean and standard deviation. To find association between dyspnoea and depression in the study group chi square test was applied. Bivariate relationships between the variables were assessed by the correlation coefficient(r). A 'p' value of less than 0.01 was considered as significant. 'p' value of less than 0.01 was taken instead of less than 0.05 to make this test more stringent and thus more firmly establishing the relationship between the two variables.

Results

The characteristics of the study population are shown in table 1. According to THE MMRC scale there was 1 patient (2%) in grade 0, 14 patients (28%) were in grade 1, 15 (30%) patients were in grade 2, 10 (20%) patients were in grade 3 and 10 patients (20%) were in grade 4. Out of these 50 patients one patient who was classified in grade 0 of MMRC scale was not suffering from depression and among the remaining 49 patients, 12 (25%) patients were having mild depression, 17 (35%) were having moderate depression, 11 (22%) were having severe depression and 9 (18%) were having very severe depression. Distribution of patients in different MMRC grades with their grading of depression is shown in figure 1.

Table-1: Characteristics of study population

Variables	Value
Mean Age (in years)	60.28
Mean MMRC score	2.28
Standard deviation of MMRC score	1.143
Mean HAM-D score	17.2
Standard deviation of HAM-D score	5.402
Mean FVC (in litres)	1.974
Standard deviation of FVC	0.317
Mean FEV ₁ (in litres)	1.163
Standard deviation of FEV ₁	0.268

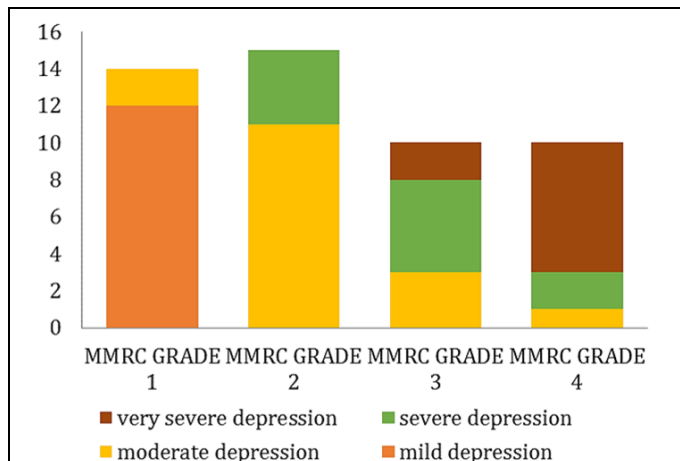


Figure-1: Distribution of patients in different MMRC grades with their grading of depression

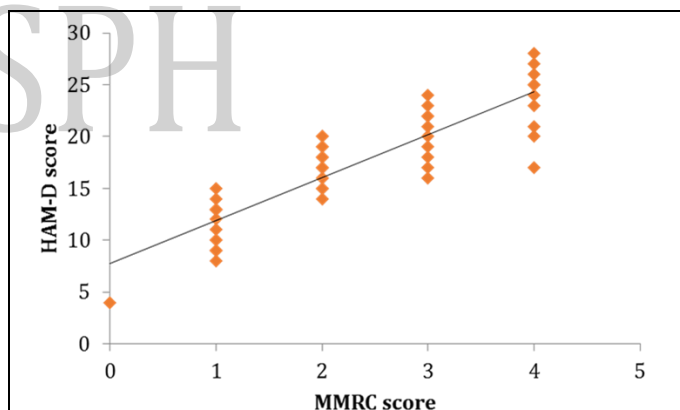


Figure-2: Correlation between MMRC score and HAM-D score

Chi square value came out to be 18.79 (p<0.001) with degrees of freedom 1. Bivariate associations between MMRC grades with HAM-D score were analyzed. As shown in figure 2, a significant positive correlation between the MMRC grade and HAM-D score (r=0.879, P<0.01) was observed.

Discussion

The burden of chronic obstructive pulmonary disease (COPD) is rising. By 2020, COPD is projected to cause over 6 million deaths annually worldwide, thus becoming the third leading cause of death in the world.^[12] Comorbidities in COPD potentiate the morbidity of COPD, leading to increased hospitalizations and healthcare

costs. They can frequently cause death, independently of respiratory failure. Comorbidities make the management of COPD difficult and need to be evaluated and treated adequately.

Psychological disturbances are common in COPD, they are closely linked with dyspnoea, and depression is more frequent in COPD than in other chronic diseases. One study suggested that the first hospitalization for COPD occurs sooner in patients with concomitant anxiety and/or depression. One hypothesis is that dyspnoea might be perceived more intensely and earlier in these patients.^[13] Depression affects between 20% and 60% of COPD patients depending on the study, COPD stage and scale used.^[14-16] The mortality and readmission rate among anxious and/or depressive COPD patients increases during the 30 days following hospitalization.^[17] The presence of depression has prognostic value, as shown in a study in COPD patients hospitalized for exacerbation.^[18] Mortality following a COPD exacerbation was greater among the depressive patients.

When patients start to feel short of breath, they worry that they are not getting enough air, which causes psychological disturbances which ultimately makes them breathe harder and faster, which makes the dyspnoea worse. This is dyspnoea cycle. When people experience this, it can be so distressing that they start to limit their activities in order to avoid anything that may cause them to feel shortness of breath. Not only does this eventually end up taking all the joy out of life, but being sedentary can lead to many other problems, like obesity, which makes it even tougher to breathe.^[19] Also bronchoalveolar lavage (BAL) cytological findings correlated significantly with the presence of the anxiety and depression symptoms. It is explained by reasoning that BAL abnormalities reflect the distal lung damage, and as the lung damage gets worse dyspnoea increases.^[20]

A study aimed at estimating the prevalence of psychological distress in patients attending a cancer centre in Milan (Italy), found a 16% prevalence of major depressive disorders and generalized anxiety disorders, both evaluated through questionnaires^[21], while another study carried out in Scotland, also in lung cancer patients, found a higher prevalence of depression than anxiety (22% and 9%, respectively).^[22] This comparison stresses the importance of largely undiagnosed psychological factors in COPD, in comparison with neoplastic diseases, which are commonly regarded as severe conditions affecting psychological status.

With the increasing awareness of the high prevalence and impact of anxiety-related symptoms in patients with COPD, it is interesting to note that psychological manifestations of COPD are treated in only a minority of patients. Few studies have investigated the effectiveness of specific medications for anxiety and depression in patients with COPD.^[23,24] There is evidence available for the efficacy of pharmacological treatments, cognitive behavioural therapy, pulmonary rehabilitation, relaxation therapy and palliative care in COPD. Therapeutic modalities that have not been proven effective in decreasing anxiety and depression in COPD, but which have theoretical potential among patients, include interpersonal psychotherapy, self-management programmes, more extensive disease management programmes, supportive therapy and self-help groups. Besides pulmonary rehabilitation that is only available for a small percentage of patients, management guidelines make scant reference to other options for the treatment of mental health problems.^[25]

Evidence for the benefit of antidepressant therapy for older COPD patients with depression is sparse and inconclusive. A study using the selective serotonin reuptake inhibitor fluoxetine in older COPD patients was unsuccessful.^[26] This trial failed because majority of the patients refused to participate in the study, and one-third of the patients withdrew from the trial because of side-effects. Those who refused the treatment reported that they could not understand the relevance of antidepressant therapy to their condition. Similar findings were also reported by Lacasse et al.^[27] in a 12-week, randomized double-blind placebo-controlled trial of paroxetine in end-stage COPD using the Chronic Respiratory Questionnaire (CRQ) as an outcome measure. The tricyclic antidepressants (TCAs) have been tested in a few studies. Although the results are contradictory, there is some evidence that TCAs are effective. Borson et al. studied 30 patients who completed a 12-week, randomized, controlled trial of nortriptyline. Nortriptyline was clearly superior to placebo for treatment of depression.^[28] It has also been shown that imipramine in combination with diazepam is effective.^[29] Treating elderly patients with TCAs like imipramine and nortriptyline is not unproblematic due to an increased risk of severe side-effects. The decision to start a TCA treatment balances the documented efficacy and the increased risk of side-effects in elderly patients.

The strength of the study was that it very firmly concluded the positive correlation between dyspnoea and associated depression in patients with COPD. The

limitation of the study was that a relatively small sample size was taken for study which may not represent whole population and thus for better understanding of the relation between dyspnoea and depression in COPD patients a study with sufficiently large sample size is to be done so that it represents the population to a better extent.

Conclusion

We conclude from our study that there is definite association between dyspnoea and depression in COPD patients. Also there is a positive correlation between the grade of dyspnoea and the grade of depression in COPD patients i.e. as the severity of dyspnoea increases, the risk of depression increases and more dyspneic patients are more depressed. So the psychological comorbidities in patients of COPD must be seriously considered as a part of management as they significantly affect the morbidity and mortality in COPD. More studies are necessary to establish a definitive treatment guideline for depression in COPD and pharmacological and non-pharmacological treatment modalities must be evaluated further for their usefulness in treating depression in COPD patients.

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