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A study on the effect of exacerbations on the quality of life of patients with chronic obstructive pulmonary disease

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ABSTRACT

Aim: The main aim of this study is to evaluate the effect of exacerbations on the quality of life of the patients with chronic obstructive pulmonary disease. **Materials and Methods:** Patients of both the genders and with an age of above 18 years of patients who were diagnosed with COPD were included in this prospective study. Modified British Medical Research Council (m-MRC) Dyspnoea Scale was used to establish functional impairment due to shortness of breath in the study participants. Saint George's Respiratory Questionnaire (SGRQ) was also used to assess the patient's overall health and quality of life-based on self-report. **Results:** Among the 110 study participants, 87.3% were males and 12.7% were females. It was observed that majority of the patients were in the age group 51-60 years (43.6%). The most frequently observed co-morbidities were hypertension (22.7%) followed by diabetes mellitus (19.1%). Most of the patients were observed to be with m-MRC grade-3 (42.7%) followed by m-MRC garde-2 (39.1%). The SGRQ score was observed to be increased with increase in the frequency of exacerbations. **Conclusion:** Clinical Pharmacist should take the responsibility in providing effective evidence based therapeutic recommendations for the better management and well-being of the COPD patients.

Keywords: Chronic obstructive pulmonary disease; exacerbations; hypertension.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a life-threatening chronic lung disease that gradually constricts the airways causing difficulty in breathing. In Indians, the prevalence of COPD is 5% in males and 3.2% in females who are over the age of 35 years [1, 2]. However, co-morbidities such as hypertension, diabetes mellitus and anaemia may highly increase the severity of COPD that decreases the possibility of complete health restoration. Co-morbidities not only contribute to increased exacerbations but also limit the quality of life that leads to higher risks of mortality [3]. The prevalence of co-morbidities in COPD patients is usually higher and this significantly decreases the health status and quality of life of COPD patients [4]. The term exacerbations in reference to COPD can be defined as the worsening of existing COPD conditions including its signs and symptoms. Exacerbations can rapidly increase the severity of the disease which may cause life-threatening situations [5–7]. The main aim of this study is to evaluate the effect of exacerbations on the quality of life of the patients with chronic obstructive pulmonary disease.

MATERIALS AND METHODS

This was a prospective study conducted for a period of six months in the department of Respiratory Medicine at GSL General Hospital, Rajahmundry. Patients of both the genders and with an age of above 18 years of patients who were diagnosed with COPD were included in this study. Non-smokers, ex-smokers with smoking history of <10 pack years and patients with inflammatory diseases other than COPD were excluded from this study. Patient data was collected from a previously designed data collection form.

In this study, the Modified British Medical Research Council (m-MRC) Dyspnoea Scale was used to establish functional impairment due to shortness of breath. According to this scale, the dyspnoea can be categorized into Grade 0, 1, 2, 3 and 4. Individuals with grade-0 dyspnoea may get breathlessness with strenuous exercise, individuals with grade-1 dyspnoea may get short of breath when hurrying on level ground or walking up a slight hill, individuals with grade-2 dyspnoea may walk slower than the individuals of same age on the level because of breathlessness when walking at their own pace on the level, grade-3 dyspnoea may get when an individual stops for breath after walking about 100m or after a few minutes on the level and individuals with grade-4 dyspnoea may feel

too breathlessness to leave the house or even when dressing or undressing. Saint George's Respiratory Questionnaire (SGRQ) was also used to assess the patient's overall health and quality of life-based on self-report. Score ranges from 0 to 100, with higher scores indicating more limitations. In this study, the number of exacerbations per patient was compared to SGRQ score for evaluation [8–10].

RESULTS

A total of 110 patients were included in this study. Among them 87.3% were males and 12.7% were females. Table 1 represents the age wise categorization of the patients included in the study. About 5.5% of the patients were in the age group 21-30 years, 11.8% were in the age group 31-40 years, 24.5% of the patients were in the age group 41-50 years, 43.6% were in the age group 51-60 years and 14.6% were in the age group 61-70 years.

Table 1: Agewise categorization of the study participants

Age in years	Frequency (%)
21-30	6 (5.5)
31-40	13 (11.8)
41-50	27 (24.5)
51-60	48 (43.6)
61-70	16 (14.6)
Total	110 (100)

Table 2 represents the categorization of the study participants based on their level of exacerbations. About 33.6% of the patients were observed with greater than or equal to 4 exacerbations, 21.9% were observed with 3 exacerbations, again 33.6% were observed with 2 exacerbations and about 10.9% were observed with a single exacerbation.

Table 2: Categorization of the study participants based on their level of exacerbations

Exacerbation levels	Frequency (%)
1	12 (10.9)
2	37 (33.6)
3	24 (21.9)
≥4	37 (33.6)
Total	110 (100)

Table 3 represents the categorization of the COPD patients based on their co-morbidities. Majority of the patients were observed with hypertension (22.7%) followed by diabetes mellitus (19.1%) in this study.

Table 4 represents the categorization of the study participants based on the grade of dyspnoea as per the m-MRC dyspnoea scale. About 9.1% of the patients were observed with Grade-1 dyspnoea, 39.1% were observed with Grade-2 dyspnoea, 42.7% were observed with Grade-3 dyspnoea and again 9.1% were observed with Grade-4 dyspnoea.

Table 5 represents the association of SGRQ score with the number of exacerbations among the COPD patients. Among the 12 patients with single exacerbation, 7 patients were observed with a SGRQ score ranges from 21-30 and 5 patients were observed with a SGRQ score ranges from 31-40. The mean SGRQ value was found to be 28.41 (±5.72) among these patients with single exacerbation. Among the 37 patients with two exacerbations, 3 were observed with a SGRQ score ranges from 31-40 and 34 patients were observed with a SGRQ score ranges from 41-50. The mean SGRQ value was found to be 44.59 (±2.77) among these patients with two exacerbations. Among the 24 patients with three exacerbations, 14 were observed with SGRQ score ranges from 41-50 and 10 patients were observed with SGRQ score ranges from 51-60. The mean SGRQ value was found to be 50.47 (±1.92) among these patients with three exacerbations. Among the 37 patients with ≥4 exacerbations, 24 were observed with SGRQ score ranges from 51-60 and 13 patients were observed with SGRQ score ranges from 61-70. The mean SGRQ value was found to be 59.21 (±3.87) among these patients with ≥4 exacerbations.

Table 3: Categorization of the COPD patients based on their co-morbidities

Co-morbidities	Frequency (%)
Hypertension	25 (22.7)
Diabetes mellitus	21 (19.1)
Anaemia	4 (3.6)
Anaemia + Hypertension	9 (8.2)
Anaemia + Diabetes mellitus	7 (6.4)
Hypertension + Diabetes mellitus	21 (19.1)
Anaemia + sleep apnoea	3 (2.7)
Diabetes mellitus + CKD	6 (5.5)
Diabetes mellitus + Ulcer	3 (2.7)
Hypertension + Heart failure	4 (3.6)
Hypertension + CKD	7 (6.4)
Total	110 (100)

Table 4: Categorization of the study participants based on the grade of dyspnoea as per the m-MRC dyspnoea scale

m-MRC grade	Frequency (%)
1	10 (9.1)
2	43 (39.1)
3	47 (42.7)
4	10 (9.1)
Total	110 (100)

DISCUSSION

This study was conducted to evaluate the effect of exacerbations on the quality of life of the patients with chronic obstructive pulmonary disease. COPD is common in older adults and it intensifies gradually after several years [11]. As the age increases there is progressive diminishment in homeostasis resulting in increased risk of disease [12]. Among the 110 study participants, 87.3% were males and 12.7% were females. It was observed that majority of the patients were in the age group 51-60 years (43.6%). This result was similar to the study done by Wig KL et al. [13]. Smoking is the confounding factor which causes inflammation in COPD patients. It damages the air sacs, airways and lining of the lungs. In this study, the cigarette smokers were found to be 68.2% and beedi smokers were 31.8%.

Co-morbidities were considered during the evaluation process and the most frequently observed co-morbidities were

Table 5: Association of SGR Questionnaire with number of exacerbations

Number of exacerbations	SGRQ (21-30)	SGRQ (31-40)	GRQ (41-50)	SGRQ (51-60)	SGRQ (61-70)	Total (%)
1	7(100)	5 (62.5)	0 (0)	0 (0)	0 (0)	12 (10.9)
2	0 (0)	3 (37.5)	34 (70.8)	0 (0)	0 (0)	37 (33.6)
3	0 (0)	0 (0)	14 (29.2)	10 (29.4)	0 (0)	24 (21.9)
≥4	0 (0)	0 (0)	0 (0)	24 (70.6)	13 (100)	37 (33.6)
Total (%)	7(100)	8 (100)	48 (100)	34 (100)	13 (100)	110 (100)

hypertension (22.7%) followed by diabetes mellitus (19.1%). Co-morbidities may increase the risk of hospitalisation and dyspnoea which also reduce the exercising capacity in COPD patients. Hypertension is one of the most common conditions observed in COPD patients though it is not always related to a higher mortality rate. Diabetes is also one of the most common co-morbidities and COPD can also become a risk factor for type 2 diabetes. Exacerbations may worsen the survival outcome of the COPD patients by decreasing the forced expiratory volume and forced vital capacity. In this study, majority of the patients were observed with more than a single exacerbation. The exacerbations may lead to deterioration and impaired physical activity in the patients.

In this study, Modified British Medical Research Council (m-MRC) dyspnoea scale was used to assess the functional impairment due to the shortness of breath. Most of the patients were observed to be with m-MRC grade-3 (42.7%) followed by m-MRC garde-2 (39.1%). This result was similar to the study done by Altose MD et al. [14]. Saint George's Respiratory Questionnaire (SGRQ) was used to find the disease impact on the patients' health, daily activities and well being of the patients. In the present study, the SGRQ score was observed to be increased with increase in the frequency of exacerbations and this result was similar to the study done by Hana Mullerova et al. [15].

CONCLUSION

Exacerbations can impact the quality of life of the COPD patients. According to the m-MRC dyspnoea scale, the functional impairment due to the shortness of breath in majority of the study participants was observed to be grade-3 followed by grade-2. Based on the SGRQ, the score of the SGRQ was observed to be increased with increase in the frequency of exacerbations. Clinical Pharmacist should take the responsibility in providing effective evidence based therapeutic recommendations for the better management and well-being of the COPD patients.

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Conflicts of interest

Nil

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