Respiratory Medicine

TO STUDY THE PROFILE AND SEASONAL VARIATION IN PATIENTS WITH ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (AECOPD) AT TERTIARY CARE INSTITUTE

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ABSTRACT

Background: Acute Exacerbation is an important event in the management of COPD as it is significantly associated with increased morbidity and mortality. Factors determining AECOPD are poorly understood. This study describes the demographic profile, causative risk factors, seasonal variation and its correlation with severity of disease. **Material and Methods:** This observational study was conducted in 120 patients of AECOPD admitted in department of Respiratory Medicine at Mahatma Gandhi Medical College & Hospital, Jaipur during a period of 1 year. Detailed demographic data, clinical history, history of prior exacerbation during past 1 year were obtained along with physical and systemic examination, chest x-ray and spirometry (after stabilization). **Results:** Majority were males of age 51-70 years belonging to rural area. Mean number of exacerbations were 2.51 ± 1.3. Majority were smokers i.e 79.5%. Maximum cases were underweight. Maximum number of admissions were in winter (43.3%). Comorbidities were present in 103 patients. **Conclusion:** Higher age, lower socioeconomic status, rural background, low BMI, winter season, history of exacerbation during past 1 year were associated with higher number of exacerbations. COPD patients with frequent exacerbations should be carefully assessed for modifiable risk factors.

KEYWORDS : AECOPD, Frequent exacerbations, seasonal variation

INTRODUCTION

Respiratory ailments are the leading cause of morbidity and mortality globally[1]. Chronic Obstructive Pulmonary Disease (COPD) is an important health issue to seek emergency hospital visits and is currently the fourth leading cause of death in the world[2]. In India number of cases increased from 28·1 million to 55·3 million over 10 years[3]. COPD is frequently complicated by acute exacerbations (AECOPD) i.e "an acute worsening of respiratory symptoms that result in additional therapy[4]. Hospitalization for AECOPD worsens the course of COPD disease leading to rapid decline in health status. Hospitalization accounts for more than 70% of all COPD related health care costs[5,6]. Incidence of AECOPD is difficult to assess as 50% of exacerbations remains unnoticed[7]. Hospital admission for exacerbation shows a variable trend in different geographical areas[8]. Risk factors for COPD exacerbation are multifactorial. Factors causing frequent exacerbations (more than two episodes per year) are increasing age, severity of FEV1 impairment, chronic bronchial mucus hypersecretion, frequent past exacerbations, cough and wheeze, persistent symptoms of chronic bronchitis and cardiovascular diseases[9,10,11]. By identifying patients who are at risk of having frequent acute exacerbations and by treating them in a cost-effective manner, the subsequent hospital admission and disease progression could be avoided[9]. This study was planned to determine the risk factors associated with acute exacerbation of COPD in patients admitted in a tertiary care institute.

Material and Methods

This observational study was conducted after obtaining approval from institutional ethical committee, in 120 patients of Acute Exacerbation of Chronic Obstructive Pulmonary Disease (AECOPD) admitted in the department of Respiratory Medicine at Mahatma Gandhi Medical College and Hospital, Jaipur during a period of 1 year. Patients with other active respiratory diseases and those who refused for consent were excluded from the study. Patients were interviewed regarding their symptoms, exposure to risk factors, occupation, past medical history (respiratory disease, hypertension, diabetes mellitus, previous hospitalization, h/o exacerbation). After detailed physical and systemic examination, chest x-ray and spirometry cases were stratified into stages I, II, III, IV and grading A, B, C, D as per Global initiative for Obstructive Lung Disease (GOLD) guidelines.

RESULTS

Out of 120 patients of AECOPD, majority were males with a M:F ratio of 1.7:1. 70% cases lie in age group of 51-70 years. 80% patients belong to rural area. 85% belong to lower socioeconomic status. 52.5% of AECOPD patients were current smokers among which majority were males which was statistically significant. 25% were former smokers followed by 22.5% non- smokers.
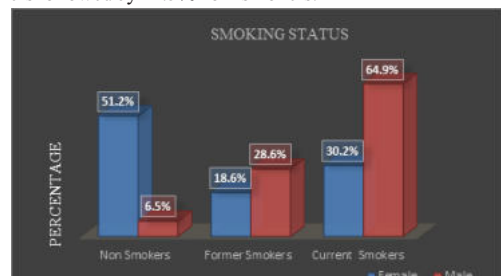

Figure 1

Nearly all patients (96.6%) had shortness of breath followed by cough (91.6%), (81.6%) had cough with expectoration and (41.67%) presented with fever. Maximum numbers of admission were in winter (43.3%) followed by autumn (25%), spring (18.3%) and least in summer (13.3%). According to GOLD criteria, maximum (45%) were in stage 3 followed by 30% in stage 2, 24.2% in stage 4 and least in stage 1 (0.8%). Majority (67.5%) of AECOPD case were in Grade D (67.5%) followed by 17.5% in grade B, 13.3% in grade C and 1.7% in grade A.

Maximum (50%) were underweight with mean BMI of 19.48 ± 3.08. Mean number of exacerbations were (2.51 ± 1.3). Patients with 5, 6 & 7 exacerbations had lower BMI. 75% had frequent exacerbations and 25% had infrequent exacerbations.
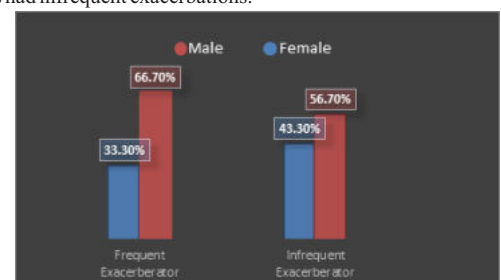

Figure 2

Comorbidities were present in 103 patients. Inactive Pulmonary Tuberculosis (PTB) was present in 29% patients, 19.16% suffered from Diabetes Mellitus (DM), Hypertension (HTN) was present in 16.66% patients, 10.83% had Cardiovascular Disease (CAD) and 10% had Pulmonary Arterial Hypertension (PAH). More comorbidities were seen in frequent exacerbations (FE) than infrequent exacerbations (IE) and incidence of PAH was significantly more in them.
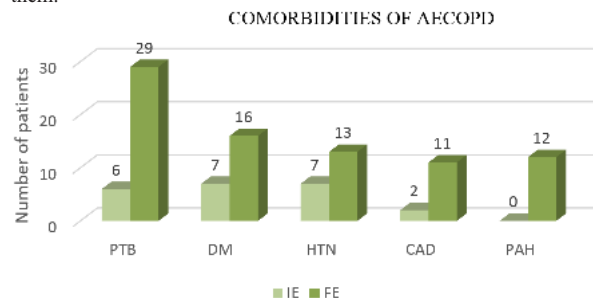

Figure 3

Risk factors associated with frequent exacerbations i.e. increasing age (50-70 years), longer duration of disease (>10years) and severity of COPD (grade 3 or 4) were found to be statistically significant.

Table 1

Risk Factors	IE	FE	X^2 / P value
Higher age (50-70 years)	20	85	15.87 / <0.001 (Significant)
Low BMI (<18.5)	12	48	1.6 / 0.206
Current Smokers	15	48	0.401 / 0.81
Productive Cough	13	41	0.49 / 0.92
Poor adherence to Therapy	26	67	1.92 / 0.16
Winter Season	13	39	10.62 / 0.47
Longer Duration of Disease (>10years)	0	15	5.71 / 0.01 (Significant)
Severity of disease (COPD Grade 3 or 4)	0	52	120.1 / <0.001 (Significant)

DISCUSSION

According to smoking status, majority of case were current smokers among which majority were males. This was in consensus with the study done by Reddy et al[12], Bhatia et al[13] and Mohapatra et al[11]. The mean BMI in our study was 19.48 ± 3.08 suggesting majority (96%) were underweight or had normal BMI. There was a significant correlation between number of exacerbations during past 1 year and lower BMI. This could be explained by the fact that in India, majority of patients were diagnosed in late stages of COPD where mean BMI decreases and had poor health status which makes them more susceptible to infections as compared to western population. Our finding corelates well with Sajal de et al[14] and Pipliwal et al[15]. Peak admissions of AECOPD patients were in winter season i.e December to February (43.3%) Similar results were reported by Chandra al[16] and Vilkmen et al[17]. Thus, admissions of AECOPD had strong relation with seasonal variation, with a sudden rise of cases during winter season. In our study we reported frequent exacerbations in 3/4th of the patients. Similarly, Jiang et al[18] had reported 84.6% of frequent exacerbations. Hurst et al[19] had reported 22% of Frequent exacerbations in moderate COPD patients and 47% in very severe COPD patients. We found that all comorbidities were highest in frequent exacerbations group and PAH was found to be significantly high. Bhatia et al[13] also compared comorbidities between frequent exacerbations and infrequent exacerbations but there was no statistically significant difference. Reddy et al[12] had reported that diabetes was commonly associated with COPD followed by inactive Pulmonary tuberculosis. In our study we had correlated several risk factors with frequent and infrequent exacerbators. Higher age (50-70 years), longer duration of disease (>10years), severity of disease was found to be statistically significant. Cao et al[20] reported duration of disease (>5years) and grade 3 and 4 COPD (FEV1<50%) was significant risk factor for frequent exacerbators. Reddy et al[12] and Hurst et al[19] had also reported that past history of exacerbation to be the single most important risk factor for future exacerbations.

CONCLUSION

Peak admissions were in winter season. Higher age (50-70) years,

longer duration of disease (>10 years) and severity (grade 3 and 4) was found to be a significant risk factors associated with frequent acute exacerbation of COPD. Lower BMI along with past history of exacerbations during past 1 year was associated with increased number of exacerbations. We concluded that early recognition of modifiable risk factors of AECOPD cases could help in prevention of further emergency visits or hospitalizations.

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