

**ORIGINAL RESEARCH**

# Evaluation of Profile of COPD Patients Admitted for Acute Exacerbation at a Tertiary Care Hospital

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### ABSTRACT

**Background:** Chronic obstructive pulmonary disease (COPD) is a poorly reversible disease of the lungs that is one of the major causes of morbidity and mortality worldwide. An acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is a clinical diagnosis made when a patient with COPD experiences a sustained (e.g., 24–48 h) increase in cough, sputum production, and/or dyspnea. Hence; the present study was conducted for assessing the profile of COPD patient admitted for acute exacerbation. **Materials & Methods:** A total of 100 subjects were enrolled in the present study. Inclusion criteria for the present study included subjects of more than 40 years of age and subjects with presence of AECOPD. Patients of AECOPD were those with increase in sputum quantity, needing hospital admission or a new prescription. Data was collected from eligible patients such as the age, gender, body mass index were noted. Smokers were identified. Past medical history was obtained. Sputum examination, chest X-ray and spirometry were done. **Results:** Mean age of the patients was 53.3 years. Majority proportion of patients were males and were of urban residence. Cough, expectoration and breathlessness were seen in 100 percent of the patients while fever and chest pain were seen in 75 percent and 22 percent of the patients respectively. According to GOLD criteria, 15 percent, 56 percent, 20 percent and 9 percent of the patients were of GOLD criteria one, two, three and four respectively. **Conclusion:** Cough, shortness of breath and expectoration indicated the clinical severity of cases of acute exacerbation of COPD.

**Key words:** Acute Exacerbation, Chronic Obstructive Pulmonary Disease.

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### INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a poorly reversible disease of the lungs that is one of the major causes of morbidity and mortality worldwide. In the United States, it is the fourth leading cause of death after heart disease, cancer, and cerebrovascular disease. By 2020, it is projected to become the third leading cause of death worldwide. Contrary to the trends for other major chronic diseases in the United States, the prevalence of and mortality from COPD have continued to rise; the death rates doubled between 1970 and 2002, and

for the first time in 2000, mortality figures for women surpassed those for men.<sup>1-3</sup>

Patients with COPD often have comorbidities such as anxiety, depression, osteoporosis, and cardiovascular disease, which further impact their overall health, quality of life (QoL), functional status, and clinical outcomes. COPD is also associated with substantial socioeconomic impact, with high direct and indirect costs—estimated at \$36 billion annually—burdening the health care system. Direct costs predominantly result from exacerbations leading to emergency department (ED) visits, hospital admissions and

readmissions, and unscheduled office visits. Clearly, COPD impacts not only patients but also the society as a whole and this impact can be reduced with early identification and appropriate treatment and management.<sup>4-6</sup> An acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is a clinical diagnosis made when a patient with COPD experiences a sustained (e.g., 24–48 h) increase in cough, sputum production, and/or dyspnea. AECOPD has clinical consequences ranging from a self-limited illness to progressive respiratory failure.<sup>7-9</sup> Hence; the present study was conducted for assessing the profile of COPD patient admitted for acute exacerbation.

## MATERIALS & METHODS

The present study was conducted for assessing the profile of COPD patient admitted for acute exacerbation. A total of 100 subjects were enrolled in the present study. Inclusion criteria for the present study included subjects of more than 40 years of age and subjects with presence of AECOPD. Patients of

AECOPD were those with increase in sputum quantity, needing hospital admission or a new prescription. Data was collected from eligible patients such as the age, gender, body mass index were noted. Smokers were identified. Past medical history was obtained. Sputum examination, chest X-ray and spirometry were done. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

## RESULTS

The mean age of the patients was 53.3 years. Majority proportion of patients were males and were of urban residence. Cough, expectoration and breathlessness were seen in 100 percent of the patients while fever and chest pain were seen in 75 percent and 22 percent of the patients respectively. According to GOLD criteria, 15 percent, 56 percent, 20 percent and 9 percent of the patients were of GOLD criteria one, two, three and four respectively.

**Table 1: Demographic data**

Variable	Number	Percentage
Mean age (years)	53.3	
Males	59	59
Females	41	41
Rural residence	38	38
Urban residence	62	62

**Table 2: Clinical profile**

Clinical profile	Number	Percentage
Cough	100	100
Expectoration	100	100
Breathlessness	100	100
Fever	75	75
Chest pain	22	22

**Table 3: GOLD criteria**

GOLD criteria	Number	Percentage
1	15	15
2	56	56
3	20	20
4	9	9
Total	100	100

## DISCUSSION

Approximately 384 million people worldwide have chronic obstructive pulmonary disease (COPD), and it is estimated that over half of patients with COPD may be undiagnosed. According to the World Health Organization, COPD is the third leading cause of death globally and costs are estimated to be in excess of 100 billion dollars per year. Most patients with COPD are fully managed in primary care. As the first-line healthcare provider, and often the gatekeeper to secondary care, primary care is not only responsible for the early detection of chronic diseases like COPD, but it also has a unique opportunity to provide

patients with evidence-based treatments.<sup>7, 8</sup> Inflammation is present in the lungs, particularly the small airways, of all people who smoke. This normal protective response to the inhaled toxins is amplified in COPD, leading to tissue destruction, impairment of the defense mechanisms that limit such destruction, and disruption of the repair mechanisms. In general, the inflammatory and structural changes in the airways increase with disease severity and persist even after smoking cessation. Besides inflammation, two other processes are involved in the pathogenesis of COPD—an imbalance between proteases and antiproteases and an imbalance between oxidants and

antioxidants (oxidative stress) in the lungs.<sup>9-11</sup> Hence; the present study was conducted for assessing the profile of COPD patient admitted for acute exacerbation. The mean age of the patients was 53.3 years. Majority proportion of patients were males and were of urban residence. Cough, expectoration and breathlessness were seen in 100 percent of the patients while fever and chest pain were seen in 75 percent and 22 percent of the patients respectively. According to GOLD criteria, 15 percent, 56 percent, 20 percent and 9 percent of the patients were of GOLD criteria one, two, three and four respectively. Cavailles A et al characterized patients with chronic obstructive pulmonary disease (COPD) who are rehospitalised for acute exacerbation. A total of 143,006 eligible patients were hospitalised for an acute exacerbation of COPD (AECOPD) in 2015–2016. 25,090 (18.8%) were rehospitalised for another exacerbation within six months. In this study, 8.5% of patients died during or immediately following the index hospitalisation and 10.5% died during or immediately after rehospitalisation. The specific cost of these rehospitalisations was € 5304. The overall total cost per patient of all AECOPD-related stays was € 9623, being significantly higher in patients who were rehospitalised compared to those who were not. In decision tree analysis, the most important driver of rehospitalisation was hospitalisation in the previous two years. Rehospitalisations for acute exacerbations of COPD carry a high epidemiological and economic burden.<sup>13</sup> Singh PS et al described the clinical profile of Acute Exacerbation of COPD (AECOPD) patients. Dyspnoea was the commonest symptom which was found in almost all the patients (99%). Co-amoxiclav, Cephalosporin, Macrolide and Fluoroquinolone were the antibiotics most frequently used. In addition to the antibiotics mentioned above, steroids were needed and administered in 74 cases (74%). Methylprednisolone and Hydrocortisone were the main steroidal preparations used. Ventilation support was needed by two (2%) patients. And altogether three patients died during the study period (3%). The period of stay in IPD by all the patients ranged from 2-35 days with a mean (SD) of 8.51 (6.268) days. COPD exacerbation was seen in ageing population of both sexes. Dyspnoea was commonest symptom and mean hospital stay was 8.51 days. Antibiotics and steroid commonly prescribed were Coamoxiclav and methylprednisolone respectively. 3% of study population expired.<sup>14</sup> Neelamma KAS et al determined the bacteriological profile, haematological profile severity and grade clinical signs and symptoms based of ‘Gold’ criteria. A cross sectional descriptive study, done on a total of 80 cases for a period of 18 months on patients admitted to Sathya Sai medical college with acute exacerbations of chronic obstructive pulmonary disease. Cases of acute exacerbation of COPD satisfying the eligibility criteria were included in the study. Clinical and microbiological parameters were noted with special preference to sputum culture

and spirometry. Bacteria was not present in 46 (57.5%) of the study population. Klebsiella pneumoniae was present in 12 cases (15.0%), pseudomonas aeruginosa in 6 (7.5%), staphylococcus aureus in 6 (7.5%), streptococcus pneumoniae in 5 (6.2%) and actinobacter in 5 (6.2%). 34 cases were sensitive to antibiotics (52.5%). Majority being sensitive to ceftriaxone, piperacillin and levofloxacin. 43 cases belonged to ‘Gold’ criteria on spirometry. Hyper inflated lung, tubular heart was present in 39 (48.8%) cases. With normal chest X-ray findings in the rest. Bacteria causing exacerbations is different in India as compared to other studies from different countries.<sup>15</sup>

## CONCLUSION

Cough, shortness of breath and expectoration indicated the clinical severity of cases of acute exacerbation of COPD.

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