



COMORBIDITY PROFILE AMONG PATIENTS HOSPITALIZED WITH ACUTE EXACERBATION OF COPD IN A TERTIARY CARE CENTRE: A DESCRIPTIVE OBSERVATIONAL STUDY

Pulmonary Medicine

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ABSTRACT

Introduction : Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of morbidity and mortality worldwide. Acute exacerbations of COPD (AECOPD) requiring hospitalization are frequently complicated by comorbid conditions that adversely influence outcomes. Data on the comorbidity profile of hospitalized AECOPD patients from tertiary care centres in telangana remain limited. **Methods :** This was a descriptive observational study conducted at a tertiary care hospital in Nalgonda district, Telangana from March 2025 to August 2025. Twenty patients admitted with AECOPD were enrolled. Comorbidity profiles were recorded at admission and analysed using descriptive statistics. **Results :** The mean age was 67.1 ± 13.4 years with a male predominance (55%). Comorbidities were present in 95% of patients. Hypertension was most prevalent (75%), followed by diabetes mellitus (35%), coronary artery disease (10%), past pulmonary tuberculosis (10%), and hypothyroidism (5%). Coronary artery disease and hypothyroidism were noted only among female participants in this small cohort. The majority carried a single comorbidity (55%), while 40% had two concurrent conditions. **Conclusion :** Hypertension and diabetes mellitus are the most prevalent comorbidities in hospitalized AECOPD patients, reflecting the rising non-communicable disease burden in India. Comprehensive comorbidity assessment and multidisciplinary management are essential in this population. Larger multicentric studies are warranted.

KEYWORDS

AECOPD, Comorbidities, Hypertension, Diabetes Mellitus, COPD, Hospitalization, Telangana

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a preventable and treatable disease characterized by persistent respiratory symptoms and airflow limitation due to airway and alveolar abnormalities [1]. The World Health Organization projects COPD to become the third leading cause of death worldwide by 2030 [1,2].

In India, the burden of COPD is substantial, with prevalence ranging from 6% to 14% in adults above 30 years of age [3]. The Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis (INSEARCH) estimated approximately 14.84 million individuals suffering from COPD in India [3]. Biomass fuel exposure, tobacco smoking, occupational dust, and past pulmonary tuberculosis contribute significantly to this burden [3,4].

Acute exacerbation of COPD (AECOPD) is defined as an acute worsening of respiratory symptoms requiring additional therapy [1]. Hospitalizations due to AECOPD are associated with accelerated lung function decline, reduced quality of life, and increased mortality risk [2,5].

COPD is frequently associated with multiple systemic comorbidities. Cardiovascular disease, diabetes mellitus, hypertension, and past tuberculosis are frequently encountered comorbid conditions that independently worsen outcomes during acute exacerbations [5,6].

Comorbidities in COPD significantly influence hospitalization duration, treatment complexity, healthcare expenditure, and mortality. Early identification of associated systemic illnesses during AECOPD hospitalization may improve multidisciplinary care and reduce adverse outcomes.

Despite the growing COPD burden in Telangana, published data specifically describing the comorbidity profile of hospitalized AECOPD patients from this region remain limited. The study provides preliminary institutional data from a semi-urban tertiary care center in Telangana where biomass exposure and post-tubercular lung disease remain clinically relevant. The present study was undertaken to address this gap.

MATERIALS AND METHODS

Study Design and Setting

This was a hospital-based descriptive observational study conducted at a tertiary care hospital in Nalgonda district, Telangana, serving a semi-urban and rural population.

Study Period

6 months

Study Population

All patients admitted with a diagnosis of AECOPD during the study period.

Sample Size

Twenty consecutive patients satisfying inclusion criteria were enrolled.

Inclusion Criteria

- Patients aged 18 years and above
- Diagnosed with COPD based on clinical history, examination, and available spirometric or radiological evidence
- Admitted with acute worsening of dyspnea, cough, and/or sputum production requiring hospitalization

Exclusion Criteria

- Acute exacerbation due to pneumothorax, pulmonary embolism, or cardiac failure as primary diagnosis
- Patients who refused consent
- Incomplete records

Data Collection

A structured proforma was used to record demographic details, past medical history, and comorbid conditions at the time of admission. Comorbidities were documented based on patient history, prior medical records, and current medication use.

Statistical Analysis

Categorical variables were expressed as frequencies and percentages. Continuous variables were expressed as mean $\pm$ standard deviation. Data were entered and analyzed using Microsoft Excel 2019.

Ethical Approval

The study was approved by the Institutional Ethics Committee. Written informed consent was obtained from all participants.

RESULTS

Demographic Profile

A total of 20 patients were enrolled from March 2025 to August 2025. The age ranged from 37 to 90 years with a mean age of 67.1 ± 13.4 years. Males constituted 55% (n=11) and females 45% (n=9). The majority of patients belonged to the 60–69 year age group (35%).

Distribution of Comorbidities

Comorbidities were present in 19 out of 20 patients (95%).

Hypertension was the most prevalent comorbidity, identified in 15 patients (75%), with higher prevalence among males (81.8%) compared to females (66.7%). Diabetes mellitus was present in 7 patients (35%), with greater male preponderance (45.5% vs 22.2%). Coronary artery disease was identified in 2 patients (10%) and was noted only among female participants in this cohort. Past pulmonary tuberculosis was documented in 2 patients (10%), equally distributed between sexes. Hypothyroidism was present in 1 female patient (5%).

Comorbidity Burden per Patient

One patient (5%) had no comorbidity, 11 patients (55%) had a single comorbidity, and 8 patients (40%) had two concurrent comorbidities. No patient had three or more comorbidities.

Smoking and Biomass Fuel Exposure

Smoking and biomass fuel exposure were common among hospitalized AECOPD patients. Eight patients (40%) had a history of smoking exposure alone, while 5 patients (25%) reported biomass fuel exposure alone. Two patients (10%) had both smoking and biomass exposure. Five patients (25%) had no documented exposure history.

DISCUSSION

The mean age in the present study was 67.1 years, with the majority of patients belonging to the sixth and seventh decades of life. This observation is consistent with previous Indian studies reporting higher hospitalization rates among older COPD patients due to progressive airflow limitation and cumulative exposure to risk factors [5,6]. The inclusion of a younger female patient in this cohort may reflect the contribution of biomass fuel exposure, which remains an important non-smoking risk factor for COPD among women in rural and semi-urban India [3,4].

A slight male predominance (55%) was observed in the present study. This finding is similar to earlier Indian studies where smoking and occupational exposures were more common among males [3]. However, females constituted a substantial proportion of the study population (45%), likely reflecting continued exposure to indoor biomass fuel smoke in semi-urban households [3,4].

Exposure analysis demonstrated that smoking exposure alone was present in 40% of patients, biomass exposure alone in 25%, while 10% had combined exposure. These findings highlight the dual burden of tobacco smoke and household air pollution in the development of COPD in India. Similar observations have been reported in Indian epidemiological studies, particularly among women from rural and semi-urban settings [3,4].

Comorbidities were present in 95% of hospitalized AECOPD patients, emphasizing that COPD frequently coexists with systemic illnesses. This finding is comparable with previous hospital-based studies reporting high multimorbidity burden among COPD patients [6]. The ECLIPSE study also demonstrated that comorbid conditions are common even in stable COPD populations [5].

Hypertension was the most prevalent comorbidity, identified in 75% of patients. Similar findings have been reported in earlier COPD studies from India and other countries [7]. Shared mechanisms such as chronic systemic inflammation, endothelial dysfunction, hypoxia, and advancing age may contribute to this association [7,8]. Recognition of hypertension during hospitalization is important because corticosteroid therapy and fluid management may influence blood pressure control during exacerbations [1].

Diabetes mellitus was present in 35% of patients, with greater prevalence among males. This observation is consistent with the increasing diabetes burden reported across South India [9]. Acute exacerbations often require systemic corticosteroid therapy, which may worsen hyperglycemia and complicate inpatient management [9]. Careful blood glucose monitoring is therefore important during hospitalization.

Coronary artery disease was identified in 10% of patients and was observed only among female patients in this cohort. However, the small sample size limits any definitive interpretation regarding gender-based distribution. Previous studies have demonstrated significant cardiovascular comorbidity burden among COPD patients irrespective of gender [7,8]. Early identification of coexisting coronary artery disease remains clinically important because cardiovascular events

contribute substantially to COPD-related morbidity and mortality.

Past pulmonary tuberculosis was documented in 10% of patients. Post-tubercular obstructive airway disease is increasingly recognized as an important contributor to chronic respiratory morbidity in India [10]. Structural lung damage, fibrosis, and persistent airflow limitation following tuberculosis may predispose patients to recurrent respiratory symptoms and exacerbations.

Hypothyroidism was observed in one female patient. Although uncommon in this cohort, thyroid dysfunction may contribute to fatigue, respiratory muscle weakness, and reduced exercise tolerance in COPD patients [9].

Most patients in the present study had either one (55%) or two (40%) comorbidities, while none had three or more concurrent conditions. This pattern may reflect the relatively small sample size and the semi-urban population served by the institution. Larger studies from metropolitan centers have reported higher multimorbidity burden among hospitalized COPD patients [6].

CONCLUSION

Comorbidities are highly prevalent among hospitalized AECOPD patients, present in 95% of this cohort. Hypertension and diabetes mellitus are the most frequently encountered conditions, reflecting the rising non-communicable disease burden in India. Coronary artery disease was observed only among female patients in this cohort; however, larger studies are required to determine whether this represents a true gender-related trend. Past pulmonary tuberculosis highlights the continued relevance of post-tubercular lung disease as a COPD contributor in this region. Comprehensive comorbidity assessment and multidisciplinary management should be integral components of AECOPD hospitalization protocols. Larger multicentric studies are warranted to validate these findings across different regions of India.

LIMITATIONS

- Small sample size (n=20)
- Single-centre study
- Comorbidities were documented based on available medical records and patient-reported history
- No long-term follow-up was performed
- Spirometric confirmation was not available for all patients
- No inferential statistical analysis was performed due to the small sample size

Table 1: Age and Gender Distribution

Age Group (Years)	Male	Female	Total	Percentage
<50	0	2	2	10%
50–59	2	2	4	20%
60–69	4	3	7	35%
70–79	3	2	5	25%
≥80	2	0	2	10%
Total	11	9	20	100%

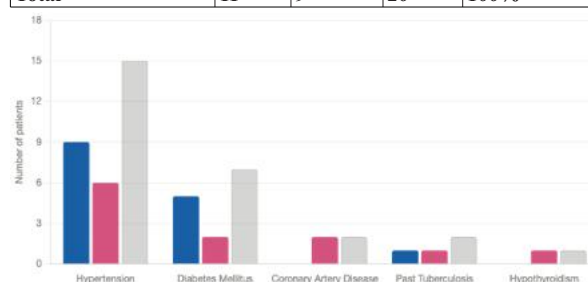


Figure 1: Comorbidity distribution by gender

Table 2: Comorbidity Distribution with Gender

Comorbidity	Male (n=11)	Female (n=9)	Total (n=20)	Percentage
Hypertension	9 (81.8%)	6 (66.7%)	15	75%
Diabetes Mellitus	5 (45.5%)	2 (22.2%)	7	35%
Coronary Artery Disease	0 (0%)	2 (22.2%)	2	10%
Past Pulmonary Tuberculosis	1 (9.1%)	1 (11.1%)	2	10%
Hypothyroidism	0 (0%)	1 (11.1%)	1	5%

Table 3: Number of Comorbidities per Patient

Number of Comorbidities	Number of Patients	Percentage
None	1	5%
One	11	55%
Two	8	40%
Three or more	0	0%
Total	20	100%

Table 4: Smoking and Biomass Fuel Exposure Profile

Exposure Type	Number of Patients	Percentage
Smoking only	8	40%
Biomass exposure only	5	25%
Both smoking and biomass exposure	2	10%
No documented exposure	5	25%

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