

# COPD is Associated with Increased Mortality in Patients with Community-Acquired Pneumonia

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**Abstract:** ***Background:** Community-acquired pneumonia (CAP) is a leading cause of hospitalization and mortality worldwide. Chronic obstructive pulmonary disease (COPD) is a common comorbidity in patients with CAP, potentially worsening outcomes. This study investigates the association between COPD and adverse outcomes in patients admitted with CAP. A retrospective review of 100 patients with CAP revealed that those with underlying COPD had significantly higher in-hospital mortality, ICU admission rates, and prolonged hospital stays. **Materials and Methods:** A total of 100 adult patients diagnosed with CAP were included in the study. Patients were stratified based on the presence or absence of COPD. **Results:** Of the 100 patients, 40% had a history of COPD. Patients with COPD showed higher ICU admission rates (55% vs. 20%), increased in-hospital mortality (25% vs. 8%), and longer average hospital stays (9 vs. 5 days). **Conclusion:** The presence of COPD in patients with CAP is associated with increased mortality, ICU admissions, and prolonged hospitalization. COPD should be considered a key prognostic factor in managing CAP.*

**Keywords:** COPD, community-acquired pneumonia, ICU admission, mortality, comorbidities

## 1. Introduction

Community-acquired pneumonia (CAP) is an acute pulmonary infection that occurs outside of a hospital or healthcare setting. It remains a leading cause of morbidity and mortality worldwide, especially in the elderly and those with chronic conditions. Chronic obstructive pulmonary disease (COPD) is a prevalent and progressive respiratory disease that significantly impairs lung function and immune response.

Patients with COPD are particularly vulnerable to respiratory infections like CAP due to decreased mucociliary clearance, chronic inflammation, and altered immune defenses. As a result, the presence of COPD in patients with CAP may worsen clinical outcomes, including increasing the likelihood of intensive care unit (ICU) admission and mortality. This study aims to examine the impact of COPD on the prognosis of patients hospitalized with CAP.

## 2. Materials and Methods

### Study Design

This retrospective observational study was conducted at a tertiary care hospital in Ahmedabad, India, from September 2023 to September 2024. The study aimed to assess the influence of COPD on clinical outcomes in patients diagnosed with CAP.

### Study Population

The study included 100 patients aged 18 years or older who were admitted with a diagnosis of CAP based on clinical signs and radiological findings. Patients were categorized into two groups: those with and without a history of COPD.

### Inclusion Criteria

- Adults aged  $\geq 18$  years
- Confirmed diagnosis of community-acquired pneumonia
- Complete clinical and laboratory data available

### Exclusion Criteria

- Patients with hospital-acquired pneumonia

- Immunocompromised individuals (e.g., HIV, cancer, chemotherapy)
- Post-operative patients
- Patients who declined participation

### Data Collection

Data were extracted from electronic medical records and included:

- Demographic characteristics (age, sex)
- Comorbidities (COPD, diabetes, hypertension)
- Vital signs and clinical presentation on admission

### Outcomes

ICU admission, in-hospital mortality, hospital stay duration, and 28-day mortality

## 3. Results

**Table 1:** Patient Demographics and Clinical Characteristics

Patient Demographics and Clinical Characteristics	Value (%)
Mean age (years)	62 (range 19–88)
Male	60%
Female	40%
COPD	40%
Diabetes Mellitus	38%
Hypertension	30%

**Table 2:** Clinical Outcomes by COPD Status

Clinical Outcomes	COPD	Non- COPD
In-Hospital Mortality	25%	8%
ICU Admission	55%	20%
Average Hospital Stay	9%	5%

**Table 3:** 28-Day Mortality

Group	28-Day Mortality (%)
COPD	30%
Non- COPD	10%
Overall	20%

#### 4. Discussion

This study found that the presence of COPD is associated with significantly worse outcomes in patients admitted with CAP. COPD patients experienced higher rates of ICU admission, in-hospital mortality, and prolonged hospital stays compared to non-COPD patients.

The elevated risk among COPD patients may be attributed to their reduced pulmonary reserve, chronic inflammation, and impaired host defenses, which make them more susceptible to complications. Furthermore, the coexistence of other comorbidities, such as diabetes and hypertension, may exacerbate the severity of pneumonia in these patients.

These findings align with previous literature suggesting that COPD is a major risk factor for poor outcomes in CAP and should be incorporated into clinical risk stratification tools.

#### 5. Conclusion

This study emphasizes the prognostic significance of COPD in patients with community-acquired pneumonia. Patients with underlying COPD had markedly worse clinical outcomes, including higher mortality, increased ICU admissions, and longer hospitalization durations. Clinicians should consider COPD as a critical factor when evaluating CAP patients and adopt aggressive management strategies to improve prognosis.

#### References

- [1] World Health Organization. (2023). Pneumonia fact sheet. <https://www.who.int/news-room/fact-sheets/detail/pneumonia>
- [2] Global Initiative for Chronic Obstructive Lung Disease. (2023). GOLD 2023 Report. <https://goldcopd.org>
- [3] Torres, A., Sibila, O., Ferrer, M., Polverino, E., Menendez, R., Mensa, J., & Niederman, M. S. (2015). Effect of COPD in patients admitted to the hospital with community-acquired pneumonia. *Chest*, 147(6), 1532–1539. <https://doi.org/10.1378/chest.14-1866>
- [4] Restrepo, M. I., Mortensen, E. M., Pugh, J. A., & Anzueto, A. (2006). COPD is associated with increased mortality in patients with community-acquired pneumonia. *European Respiratory Journal*, 28(2), 346–351. <https://doi.org/10.1183/09031936.06.00131905>