



**ORIGINAL RESEARCH PAPER**

**General Medicine**

**HEART FAILURE AS AN IN-HOSPITAL MORTALITY PREDICTING FACTOR IN COPD PATIENTS: AN OBSERVATIONAL STUDY**

**KEY WORDS:** COPD, HEART FAILURE, IN HOSPITAL MORTALITY, PREVALANCE

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**ABSTRACT**

**INTRODUCTION:** Chronic obstructive pulmonary disease (COPD) and heart failure are two major causes of mortality, globally. Coexistence of both conditions cause diagnostic difficulties because of similarities in symptoms and signs. Most patients with both conditions are characterized by high mortality. Age, sex and comorbidities are considered to be the major predictors of mortality in patients with COPD and heart failure alone. Undiagnosed heart failure in patients of COPD has catastrophic consequences. **AIM OF STUDY:** To describe prevalence of heart failure in COPD patients and its impact on in hospital mortality. **MATERIAL AND METHODS:** An observational study was conducted on 100 diagnosed cases of COPD for a period of 6 months, admitted in medicine ward and medical intensive care unit at Jhalawar Medical College. **RESULTS:** Out of the 100 patients studied, 72 (72%) were males and 28 (28%) were females. 23 patients (23%) were diagnosed with coexisting heart failure. In hospital mortality was 12%, mortality among coexisting heart failure patients was higher (30.43%) in comparison to patients with only COPD (6.49%)- odd ratio 6.3 (95% CI 1.77-22.41). **CONCLUSION:** Heart failure has an important impact on in hospital mortality in patients with COPD. Heart failure and other comorbidities should be recognized early and properly treated in order to improve survival in patients with COPD.

**INTRODUCTION**

Chronic Obstructive Pulmonary Disease is one of the most important causes of morbidity and mortality throughout the world. It is now the 4th leading cause of death in the world. 1 COPD is a common, preventable, and treatable NCD characterized by persistent respiratory symptoms and airflow limitation due to abnormalities in the airway 2. The number had increased from 28.1 million in the 1990s to 55.3 million in 2016. India contributes significantly to the morbidity and mortality of COPD in the world, with 3% of India's disability-adjusted life years (DALYs) is recorded due to chronic respiratory diseases (CRDs), according to Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis in Adults (INSEARCH)3. Coexisting heart failure and COPD can be overlooked due to similarities in symptoms and signs, which is an important clinical implication. The main clinical manifestation of COPD and heart failure is dyspnea, which in turn is one of the most common causes of consultations, especially among elderly patients. Coexisting heart failure considerably increases the probability of death in patients with COPD in general population. Patients with chronic obstructive pulmonary disease (COPD) are at greater risk of developing comorbid heart failure (HF) than the general population4. This is not surprising when taking into consideration that COPD is associated with an increased risk of cardiovascular diseases due to smoking as a common risk factor and systemic inflammation, oxidative and physiologic stress and vascular dysfunction as a common mechanism5. Previous studies have found large amounts of unrecognized HF in COPD patients6. This study is carried out to identify epidemiology of COPD and coexisting heart failure and impact of heart failure on mortality in COPD patients.

**CASE STUDY**

An Observational cross-sectional study was carried out after getting informed consent on 100 patients over the age of 50 years admitted with diagnosis of COPD in the Department of General Medicine for the period of 6 months, from July 2022 to December 2022. Detailed clinical history, clinical examination and investigations were carried out.

**Inclusion criteria:**

Patients with COPD above 50 years of age diagnosed by symptoms & confirmed by physical, radiographic & pulmonary function tests (PFT). (FEV1/FVC <0.70, GOLD 20217).

**Exclusion criteria:**

1. Primary diagnosis of bronchial asthma, TB, bronchiectasis & lung malignancy.
2. Interstitial lung disease.
3. Coronary artery disease.
4. Hypertension.
5. Valvular heart disease.
6. Congenital heart disease.

**Investigations**

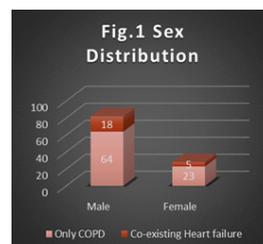
1. Routine blood investigations
2. NT-Pro BNP levels
3. Pulmonary function test
4. Chest X-Rays, ECGs
5. 2D Echocardiography

After full filling the criteria total of 100 patients were selected and Heart Failure was diagnosed with increased NT-Pro BNP levels and 2D Echo. End point of study was in-hospital mortality or discharge from the hospital.

**STUDY PERIOD**

July 2022 to December 2022

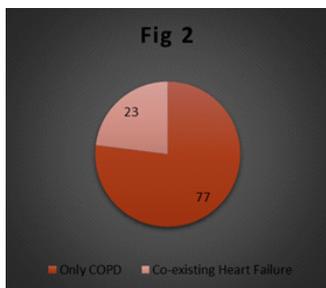
**STUDY DESIGN:** An observational cross-sectional study to calculate odds of in hospital mortality among COPD with coexisting heart failure.



**RESULTS**

Out of the 100 patients studied, 72 (72%) were males and 28 (28%) were females with mean age of 67.7 ± 8.3yrs (Fig. 1).

Prevalence of Heart failure was 23% (males 25% and in females 17.85%).



Total in hospital mortality was 12% (12 patients, male: 67%, female: 33%), out these 5 patients were from only COPD group and 7 patients were from co-existing heart failure group.

	In hospital mortality	
	Yes	No
Co-existing Heart failure group	7	16
Only COPD group	5	72
	Odds ratio: 6.3 (CL 95%, 1.77-22.41)	

**CONCLUSION:**

In our study we found that the odds of mortality in patients with COPD and coexisting heart failure were 6 times higher than in patients with COPD alone. Our study was a hospital-based observational study. We collected data from admitted patients in medicine ward and medical ICU. Our study confirmed that coexisting heart failure considerably increases the probability of death in patients with COPD in admitted patients. This is not surprising as when taking into consideration that COPD is associated with an increased risk of cardiovascular diseases due to smoking as a common risk factor and systemic inflammation, oxidative and physiologic stress and vascular dysfunction as a common mechanism (Feary JR et al.5). Age and male sex were associated with higher mortality in patients with COPD and coexisting heart failure as expected when taking into consideration data on heart failure and COPD alone, similar results were found in study by Jong P. et al.8 and Almagro P et al.9 Study by Boudestein et al.10. found that COPD patients with newly diagnosed HF experienced greater mortality. however, a smaller study by Plachi et al.11 found no difference in mortality between COPD patients with and without HF. In a recent systemic review by Axson E.L. et al.12 there is substantial evidence that heart failure increases COPD-related rehospitalization and all-cause mortality of COPD patients.

Coexisting heart failure increases considerably the odds of mortality in patients with COPD. The mortality in patients with COPD and coexisting heart failure is strongly associated with age, male sex. It is important to early recognize and adequately treat the patients with COPD and coexisting heart failure.

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