

# Examining Cardiovascular Dynamics In COPD: Echocardiographic Insights Pre And Post Acute Exacerbation Treatment

Author

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## Abstract

**Introduction:** Chronic Obstructive Pulmonary disease (COPD) is currently the 4th leading cause of death in the world and further increase in its prevalence and mortality can be predicted in coming decades. Cardiovascular disease (CVD) and COPD share similar risk factors such as ageing, history of smoking, air pollution exposure and a sedentary lifestyle, and frequently coexist. This study compares pre and post-acute exacerbation of COPD typically focuses on various parameters such as lung function, symptom severity, exacerbation frequency, and Cardiovascular parameters. It involve analyzing data from pulmonary function tests, symptom questionnaires, exacerbation diaries and echocardiography to assess changes before and after exacerbation events. The goal is to understand the impact of COPD exacerbations on Cardiovascular system and inform strategies for prevention and management.

**Objective:** To study and compare the results of echocardiographic findings before and after treatment of acute exacerbation of COPD.

**Study design:** Descriptive Cross-sectional Study.

**Materials and Methods:** Patients aged > 40 years, both males and females, admitted in PGIMS, Rohtak with AECOPD were subjected to cardiac evaluation with echocardiography to assess various possible cardiovascular diseases. These patients were followed 2 weeks after treatment with repeat echocardiography to reassess any change in cardiac status. The recorded data was compiled and entered in spreadsheet and then subjected to statistical analysis using SPSS 20 software. Pre and post treatment comparison of variables was done using paired t test and McNemar chi-square test. A p value of <0.05 was considered statistically significant.

**Results:** A total of 120 patients (65.8% males and 34.25% females) were recruited in the study of which 95 patients were followed up for repeat echocardiography and 25 patients expired during study. Most of our patients belonged to GOLD stage E(48.3%) or B(41.7%). During AE, the commonest finding was RA/RV dilatation (68.3%) followed by right ventricular hypertrophy (54.2%) and pulmonary hypertension (38.3%), and on follow up a significant improvement in cardiac function observed in AECOPD patients. We also found a direct correlation between severity of COPD and cardiovascular diseases. There was also a significant correlation between frequency of exacerbation and cardiovascular diseases. Analysis of mortality parameters revealed mortality to be directly related to severity of COPD, risk of exacerbation, degree of airflow limitation and presence of cardiovascular diseases.

**Conclusion:** COPD and CVDs are complex disorders that frequently co- exist and are associated with worse outcomes than either condition alone. So, in patients of COPD, acute exacerbation and cardiovascular complications should be ruled out and if present, then should be treated according to guidelines. Early recognition of cardiovascular issues through 2D Echocardiography screenings is crucial. By monitoring reversibility and potential complications over time, healthcare providers can prevent suffering and provide timely & effective treatments. This proactive approach not only enhances the quality of life for COPD patients but also contributes to better long-term outcome.

**Keywords:** COPD, Echocardiography, CVD

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