Journal of Clinical Advances and Research Reviews (JCARR)
Website: http://www.jcarr.in/
ISSN: 3048-6556
Vol. 3, Issue 2, Apr-Jun, 2026
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Research

A Comprehensive Study on COPD Exacerbation: Treatment, Prevention and Prognosis

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Received: 01-04-2026 / **Revised:** 05-05-2026 / **Accepted:** 06-05-2026
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Conflict of interest: Nil

ABSTRACT:

OBJECTIVES: To conclude biochemical and clinical indications of the force of a COPD compounding. To assess patients' brief and long stretch outcomes after serious increases. To examine what comorbidities mean for the expectation, recovery, and repeat of escalations. To investigate preventive strategies to cut down the pace of escalations and redesign perception **METHODOLOGY:** An impending observational survey was driven more than a half year in the Part of Pulmonology at Kamineni Crisis center, Hyderabad. Data was assembled from patient case sheets, cures, lab reports, and coordinated surveys, including the COPD Examination Test (Cat) and Morisky Remedy Adherence Scale (MMAS). The survey included 100 not entirely settled to have COPD, developed some place in the scope of 18 and 75 years while excepting pregnant women and those with continuous critical operations or extraordinary cardiovascular events. **RESULTS:** The results showed that COPD escalations were more typical in folks (54%) and dominatingly affected individuals developed 60-80 years. The fundamental triggers recognized were smoking, bacterial pollutions, and regular poisons. Cat scores revealed that most patients experienced a moderate impact on everyday presence. Bronchodilators were the most frequently embraced drugs, followed by took in corticosteroids, against microbials, and oxygen treatment. Preventive techniques like smoking suspension, pneumonic rebuilding, and vaccinations through and through diminished demolishing risks. While most patients achieved a consistent condition post-treatment, a subset remained at high bet for rehash, including the necessity for relentless checking. **CONCLUSION:** Extraordinary escalations of COPD are multifactorial and impacted by clinical, biochemical, and lifestyle limits. Recognizing high-risk patients through routine examinations can enable early intervention and further foster gauge. Practical organization techniques, including progressed, areas of strength for pharmacotherapy, and preventive measures, are principal in decreasing the heaviness of COPD escalations and working on patients' very own fulfillment. **Expressions:** COPD, extraordinary deteriorating, red hot biomarkers, comorbidities, spirometry, principal corticosteroids, innocuous ventilation, clinical outcomes, treatment, expectation, estimate.

KEYWORDS: COPD, Exacerbation, Treatment, Prognosis.

INTRODUCTION: Chronic Obstructive Pulmonary Disease (COPD) is a long-term condition that can be intermittently aggravated by episodes known as acute exacerbations of COPD (AECOPD). These exacerbations are marked by a sudden worsening of symptoms, including increased shortness of breath (dyspnoea), more frequent or intense coughing, heightened sputum production, and a change in sputum appearance, often becoming purulent (containing pus). AECOPD has significant clinical and economic consequences, such as a decline in lung function, decreased exercise capacity, hospitalizations, reduced quality of life, and in some cases, death. The economic burden is also considerable, resulting from higher healthcare costs and lost work productivity.

Etiology: COPD exacerbations are complex events resulting from interactions between various

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factors. Respiratory viral infections, particularly human rhinoviruses, are common triggers and tend to cause more severe and prolonged exacerbations. Other viruses like coronavirus, RSV, influenza, and parainfluenza can also contribute, although influenza's impact has decreased due to vaccination efforts. Bacterial infections play a significant role, with organisms like Hemophilus influenzae, Streptococcus pneumoniae, and Pseudomonas aeruginosa commonly found during exacerbations.

MATERIALS AND METHODS:

SOURCE OF DATA:

Case report form

Prescriptions of patients

Patient case sheet/medication chart

Lab reports

Patient questionnaire [Morisky scale-MMAS, CAT]

STUDY DESIGN:

The prospective and observational studies

STUDY DURATION:

6 months

STUDY CENTRE:

Out-patient clinic and Inpatient wards of the Department of Pulmonology in Kamineni Academy of Medical Sciences, Research Centre and Hospital, L.B Nagar, Hyderabad.

INCLUSION CRITERIA:

Patients aged >18, < 75 years old.

Patients with stable cardiac comorbidities.

Patient with diagnosis of COPD in department of pulmonology.

EXCLUSION CRITERIA:

Pregnant and lactating women.

Patient who are not willing for consent.

Patients with acute cardiac events (MI, unstable angina, acute myocarditis).

Patients who underwent major surgery recently (except patients with pre-existing COPD).

STUDY SITE:

The study will be conducted at Kamineni Hospital, L.B Nagar, which is a tertiary care hospital with state of art facilities for patients.

Method of collection of data:

STUDY TOOLS:

Self-designed case report form:

A data collection form will be designed to collect subject's demographic and disease specific aspects.

CAT [COPD assessment test]:

The CAT asks questions about eight areas, prompting you to assign a score ranging from 0 to 5 for each area. A score of 0 means there's no impairment in that area. A score of 5 means severe impairment. Your overall score will range from 0 to 40. Higher scores indicate your COPD has a greater impact on your overall health and well-being. The CAT correlates with the Global Initiative for Obstructive Lung Disease (GOLD) strategy, which outlines an evidence-based plan for assessing and managing COPD.

Morisky Medication Adherence Questionnaire (MMAS):

It is one of the most widely used mechanisms to assess patient adherence to medications.

Study Procedure:

Subjects meeting the inclusion and exclusion criteria would be identified during OP and IP visit by the investigator. The investigator would obtain demographics and disease information on a self-designed case report form. The subjects would be briefed about the study and willingness to participate would be ascertained. The above sets of questionnaires would help in obtaining information regarding the health-related quality of life and medication adherence.

Statistical analysis: SPSS

Sample size: All the COPD exacerbation cases in the department of pulmonology during the study period of six months. (Sample Size = 100 -121).

Results: Table 1: GENDER DISTRIBUTION AMONG PATIENTS WITH COPD EXACERBATION

Gender	Percentage
Female	46
Male	54

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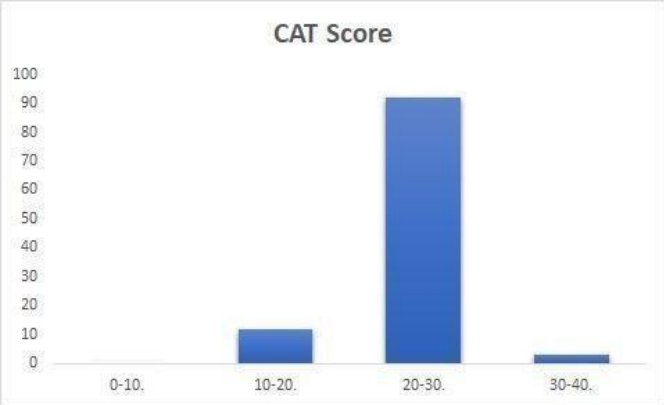
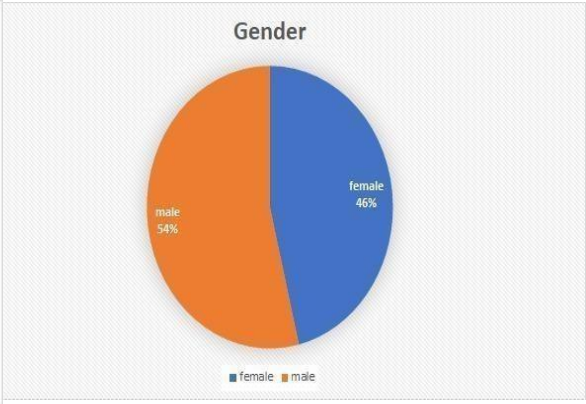
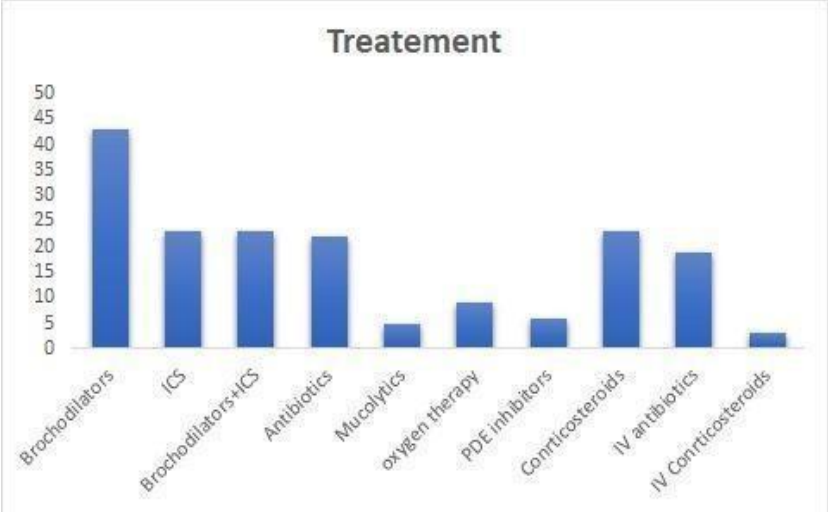




The CAT (COPD Assessment Test) score in the image suggests that most patients fall within the 20–30 range, indicating a moderate impact of COPD symptoms on their daily lives. A smaller proportion of patients have scores between 10–20, which corresponds to mild symptoms, while very few fall within the 0–10 or 30–40 ranges, representing minimal and severe symptoms, respectively. Patients with scores above 20 are at a higher risk of exacerbations and may require closer monitoring and treatment adjustments. The predominance of scores in the 20–30 range suggests that many patients experience significant symptoms that could impact their quality of life and increase the likelihood of COPD exacerbation.

Table 2: TREATMENT RECEIVED BY THE COPD EXACERBATED PATIENTS

TREATMENT	PERCENTAGE (%)
Bronchodilators	24.4
ICS	13
Bronchodilators + ICS	13
Antibiotics	12.5
IV Antibiotics	10.7
PDE Inhibitors	3.4
Oxygen therapy	5.1
Corticosteroids	13
IV Corticosteroids	1.7
Mucolytics	2.8



The data reveals that bronchodilators are the predominant treatment for exacerbations of COPD, underscoring their essential function in alleviating airway obstruction. Inhaled corticosteroids (ICS), combinations of bronchodilators with ICS, and antibiotics are also commonly employed, indicating that a significant number of patients experience inflammation and possible infections during these

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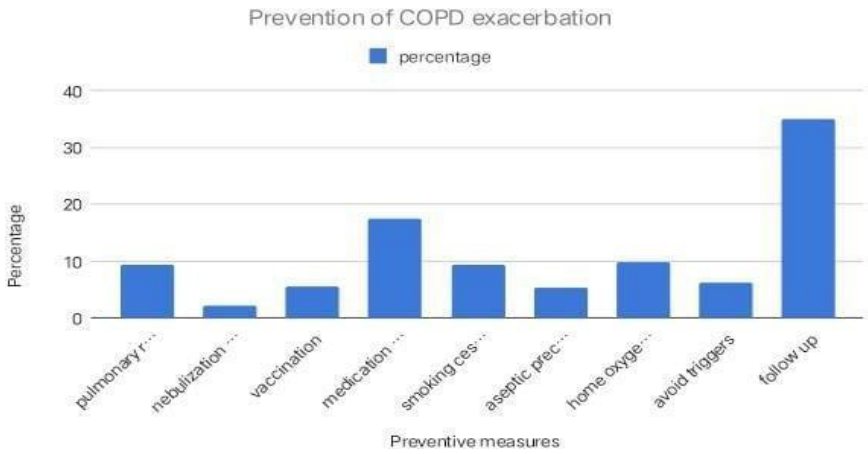
episodes. The administration of intravenous antibiotics and corticosteroids, while less prevalent, suggests that certain patients necessitate more intensive management in a hospital setting. Oxygen therapy, mucolytics, and phosphodiesterase (PDE) inhibitors are utilized less often, likely reserved for severe cases or individuals with chronic mucus production and hypoxemia.

Table 3: PREVENTIVE MEASURES USED FOR COPD EXACERBATED PATIENTS

PREVENTIVE MEASURES	PERCENTAGE (%)
Pulmonary rehabilitation	9.4
Nebulization adherence	2.3
Vaccination	5.5
Medication adherence	17.5
Home oxygen therapy	9.8
Smoking Cessation	9.4
Aseptic precautions	5.4
Avoid triggers	6.3
Follow up	35



The information indicates that home oxygen therapy is the predominant preventive strategy employed for exacerbations of COPD, underscoring its critical role in the management of severe instances. Additionally, pulmonary rehabilitation, cessation of smoking, and adherence to nebulization are vital components, highlighting the necessity for lifestyle changes and appropriate medication usage. Although vaccination, adherence to medication, and avoidance of triggers are reported less frequently, they are still crucial in mitigating the risks of exacerbations. The limited emphasis on aseptic precautions and follow-up care points to possible areas for enhancement in the strategies for managing COPD.

Table 4: PROGNOSIS OF COPD EXACERBATED PATIENTS

PROGNOSIS	PERCENTAGE (%)
Stabilized	48.5
Guarded	25.2
Slow disease progression	12.1
Risk of recurrence	9.3
Stable but requires further management	4.6

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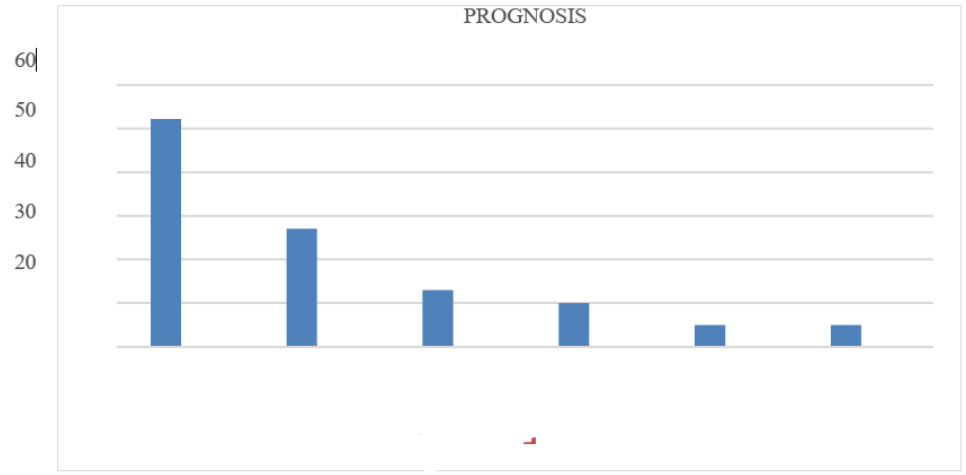

The information indicates that a majority of cases of COPD exacerbation reach a stabilized condition, reflecting the efficacy of management and treatment approaches. A considerable number of cases are classified as being in a "guarded" state, necessitating vigilant observation to avert any decline in health. A lesser proportion exhibits gradual disease progression or a likelihood of recurrence, underscoring the chronic characteristics of COPD and the necessity for continuous care. The limited occurrence of "stable but recurring" and "further management" categories implies that, although some patients may face repeated exacerbations, the vast majority can sustain stability through appropriate interventions.

DISCUSSION:

The present study is an observational study on a comprehensive study on COPD exacerbation: treatment, prevention and prognosis. A total of 107 patients were selected for the study by non-random purposive sampling.

In our study we observed that mostly people under the age of 60-80 years are mostly affected, followed by people under the age of 40-60 years, then people in between the age of 25-40 and >80 years are least affected.

In our study we found that males (54%) are most commonly affected by COPD exacerbation compared to females. In this study the common triggers which cause COPD exacerbation are smoking, bacterial infections, allergies, while seasonal variations, pneumonia, and viral infections have a lesser impact compared to others.

The COPD assessment test among these patients shows the most of them falls under the 21-30 (92) which means the higher impact of COPD exacerbation in those people.

In our study the treatment given to patients are bronchodilators (48) mostly then followed by ICS, bronchodilators+ICS, corticosteroids and antibiotics and least used drugs among them are mucolytics, PDE Inhibitors, IV corticosteroids, IV antibiotics.

Home oxygen therapy is the primary preventive strategy for COPD exacerbations, while pulmonary rehabilitation, smoking cessation, nebulization, medication adherence, vaccination, and trigger avoidance also play crucial roles, though aseptic precautions and follow-up care receive less emphasis, indicating areas for improvement in COPD management.

Most COPD exacerbation cases stabilize with treatment, while some remain in a "guarded" state requiring close monitoring, and fewer cases show progression or recurrence, highlighting COPD's chronic nature and the need for ongoing care.

CONCLUSION:

Chronic Obstructive Pulmonary Disease (COPD) exacerbations significantly impact disease progression, patient quality of life, and healthcare systems. This study highlights the importance of early diagnosis, effective treatment, and preventive strategies to reduce exacerbation frequency and severity.

Pharmacological interventions, including bronchodilators, corticosteroids, and antibiotics, remain essential in acute management, while long-

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term maintenance therapy with inhaled corticosteroids, long- acting bronchodilators, and mucolytics helps prevent further episodes. Non-pharmacological approaches such as smoking cessation, pulmonary rehabilitation, vaccination, and environmental modifications play a crucial role in improving patient outcomes.

Prognostic factors such as the BODE index, arterial blood gas levels, and biomarker analysis provide valuable insights into disease progression and mortality risks. Frequent exacerbations accelerate lung function decline, increasing the likelihood of hospitalization and complications. Therefore, a multidisciplinary, patient-centered approach is vital for optimizing COPD management.

This study underscores the need for continuous research, patient education, and healthcare system improvements to enhance COPD care.

By implementing comprehensive treatment and prevention strategies, healthcare providers can improve patient survival, reduce hospital admissions, and enhance overall quality of life for individuals living with COPD.

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