

Risk Factors of Acute Exacerbation in COPD Patients visiting Emergency Ward

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doi.org/10.56974/pmjn.953
www.pmjn.org.np

Submission Date:

2026, January, 22

Acceptance Date:

2025, March, 12

Published Date:

2025, March, 16

ABSTRACT

Introduction: Chronic obstructive pulmonary disease (COPD) is the leading cause of morbidity and mortality worldwide with an economic and social burden that is both substantial and increasing. Chronic respiratory diseases are ranked as the second highest cause of death (10%), among the total mortality cause due to non-communicable diseases in Nepal. This study is aimed at evaluating the patients visiting at emergency ward for the risk factors associated with acute exacerbation of COPD.

Methods: This is a descriptive cross-sectional study which was carried out after taking approval from the institutional review board of X hospital. Sample size (n=264) for the study was calculated using prevalence of acute exacerbation of COPD. Purposive sampling was used and all patients meeting the inclusion criteria were enrolled in the study. Using a structured proforma, data was collected for this study to evaluate the risk factors of acute exacerbation of COPD in patients who visited emergency department of X Hospital. Data was entered and analyzed in excel sheet and analyzed.

Results: Out of 265 study participants, 63% were female and 36% were male. The proportion of participants aged older than 70 years and 61-70 years was 48% each. It was found that 11% had active smoking, 15% had ongoing alcohol consumption, and 43% had history of previous hospital admission. Nearly 40% of the patients were non-adherent to the prescribed previous medications.

Conclusions: There are multiple risk factors that contribute to acute exacerbation of COPD. There should be appropriate interventions such as proper patient counseling for smoking cessation, behavior modification strategies and holistic management plan including focus on compliance to prescribed medications to minimize further exacerbation of COPD.

Keywords: COPD; exacerbation; risk factors.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is the leading cause of morbidity and mortality worldwide with an economic and social burden that is both substantial and increasing.^{1,2} Non-communicable diseases (NCDs) in Nepal account for 66% of mortality, of which chronic respiratory diseases are ranked as the second highest cause of death (10%), alongside cardiovascular diseases (30%) and cancer (9%).³

Risk factors for the exacerbation for of COPD are older age, past history of hospital admission, severity of airflow limitation, poor health status, radiological evidence

of emphysema, presence of systemic inflammation, gastroesophageal reflux disease, hypoxia, cold weather, use of beta blockers, opioids, or sedative hypnotics, non-adherence to medications. Addressing these risk factors will help to minimize the visit of patient to hospitals thereby reducing the burden of both patients and resources.^{4,5} Above-mentioned risk factors can be divided into modifiable and non-modifiable risk factors. Modifiable risk factors such as infection, non-adherence can be addressed effectively.⁶

The factors associated with the acute exacerbation of COPD in our setting have not been studied in detail. This

study mainly aimed at evaluating the patients visiting at emergency ward for the risk factors associated with acute exacerbation of COPD. Finding those common risk factors, this study will help prescribers, patients and care-takers plan for appropriate interventions such as smoking cessation, increasing the compliance to prescribed medications to reduce exacerbation among COPD patients.

METHODS

This study is a cross-sectional descriptive study. The study was conducted after getting approval from the institutional review board from X hospital (Ref. no. 593/2082/83). Sample size was calculated by using the formula $N = z^2 p (1-p) / d^2$, where z is 1.96, p is 0.78, and d is 0.05. Prevalence of acute exacerbation of COPD was taken from one study.¹⁵ Calculated sample size was 264 and data was collected from 265 patients. All diagnosed cases of COPD aged more than 40 years visiting the emergency ward during the study period were included in the study using the purposive sampling method.

After taking informed written consent from the patients, they were asked relevant questions to elicit the risk factors of Acute Exacerbation of COPD based on pretested questionnaire, a structured proforma was filled for collecting data. Data was entered and analyzed using Microsoft excel. Frequency of the risk factors were calculated in excel, presented in chart and tables.

Patients with acute exacerbation of chronic obstructive pulmonary disease (COPD) are defined as patients presented with dyspnea and/or cough and sputum that worsened over ≤ 14 days.⁷

RESULTS

Out of the 265 patients, female patients accounted for 64% and male patients accounted for 36% (Figure 1.) Patients aged more than 70 years and 61-70 years accounted for 48% each. Mean age was 71.4 years with the standard deviation of 7.5 years.

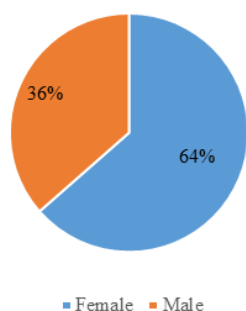


Figure 1. Gender Distribution of the acute exacerbation of COPD

Other demographic variables are presented in table 1. Among the patients presented with acute exacerbation of COPD, there was also different comorbidities and hypertension was most common (30.5%).

Table 1. Demographic profile of the patients with acute exacerbation with COPD (n=265)

Variables	n (%)
Age (years)	
51-60	8(3)
61-70	128(48.3)
>70	130(49.1)
Occupation	
In house	13(49.1)
Outside house	135(50.9)
Body mass index	
<18.5	63(23.8)
18.5-22.9	91(34.3)
23-24.9	55(20.8)
>25	56(21.1)
Co-morbidities	
Hypertension	94(35.5)
Diabetes	28(10.6)
Cerebrovascular disease	3(1.1)
Valvular heart disease and Heart failure	
	20(7.5)
Diet Pattern	
Vegetarian Diet	15(5.6)
Non-vegetarian diet	251(94.4)

Table 2 shows the prevalence of different risk factors of acute exacerbation of COPD. Among the all the study patients, 11.65% had history of active smoking and 14.7% had history ongoing alcohol consumption. Fifty seven percent of the patients never had previous hospital admission and 23% had history of previous hospital admission more than 6 months ago and 19% had been admitted recently within 6 months. It was found that 60.9% of the patients were adherent to the previously prescribed medicines for COPD.

Table 2. Risk factors in acute exacerbation of COPD (n=265)

Risk Factors	n(%)
Active smoking	31(11.65)
Ongoing alcohol consumption	39(14.66)
Previous history of hospital admission	
More than 6 months ago	63(23.68)
Within 6 months	51(19.17)
Never	152(57.14)
Presence of Gastroesophageal reflux	14(5.28)
Compliance to previous medication	162(60.9)
Use of other medications Beta blockers, Opioids, sedative hypnotics	15(5.64)

DISCUSSIONS

Out of 265 patients with acute exacerbation of COPD, there were more female patients (64%) which is similar to other studies which also found that more than half of the patients were female.⁸⁻¹¹ In contrast, in one study, male patients accounted more.¹² The increase in number of female patients in other studies were correlated with the increase exposure to biomass exposure and increase in smoking rate in females.

The analysis of the age groups in this study revealed that most patients were older than 60 years old. The proportion of patients aged older than 70 years and 60-70 years was similar 48% each. Another study also revealed the similar findings; maximum number of patients (76.0 %) were the age between 60 – 80 years who were admitted with Acute Exacerbation of COPD.⁸ The mean age (71.4 years) of the patients was found to be similar with other studies where median age was 70 years,⁹ and mean of 69 years in

another study.¹⁰

Hypertension was more common comorbidity among others in this study. This finding is similar to the study done in Dhulikhel Hospital.¹¹ The rate of active smoking in this study participants was similar to the study done in tertiary hospital of Nepal.¹² But another study revealed very high proportion (88.6%) of active smokers.⁹ This study elicited that among the patients visiting the emergency ward for acute exacerbation of COPD, 43% had previous history of hospital admission. Twenty three percent of the total patients had been admitted in the hospital more than 6months ago while 19% had recent hospital admission within 6 months. This finding of previous hospital admission was comparable to other studies (53% and 30%).^{10,12} Nineteen percent of patients had a history of previous hospitalization for COPD exacerbations within the past one year in another study.¹³

Those who presented with acute exacerbation of COPD in emergency in this study, nearly 40% were non-compliant to the previously prescribed medicines. This finding is slightly higher than the another study in which 25.6% had irregular compliance to the medications in TUTH.¹²

Our study didn't look at the association and temporal relation of risk factors with the acute exacerbation of COPD since this study was a cross-sectional study. The association of risk factors with severity of the acute exacerbation of COPD was not included in this study.

CONCLUSIONS

The study identified presence of multiple risk factors in patients with acute exacerbation of COPD visiting our center. There should be appropriate interventions such as proper patient counseling for smoking cessation, behavior modification strategies and holistic management plan including focus on compliance to prescribed medications to minimize further exacerbation of COPD.

Conflict of Interest: None

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