

Clinical characteristics and outcomes of patients of COPD with acute respiratory failure admitted to the intensive care unit

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Abstract:

Background: The study aimed to describe the clinical course, outcomes, and of chronic obstructive pulmonary disease (COPD) patients with acute respiratory failure.

Methods: This retrospective study involved patients with acute respiratory failure due to COPD of any cause admitted to the intensive care unit. Study was conducted in ICU of tertiary care hospital, Dhaka from November 2023 to December 2025 and it is a retrospective observational study. The study's primary outcome measure was to determine ICU mortality rates. The secondary outcome was to evaluate the differences between survivors and non-survivors.

Results: During the study period 1697 patients were admitted in ICU and among them 53 patients were enrolled. ICU mortality rates among all COPD patients (n=53) were 22.68% and among total ICU deaths(n=339 total ICU death during this period) was 3.53%.

IMV was applied to 30.18% of the patients (N=53). NIV used in survivor group 92.68% of cases and also along with IMV. NIV failure was higher in non-survival group and was 41.66%. HFNC used were NIV failure. Non-survivors exhibited higher rates of pneumonia, IMV, shock within the first 24 hours of

admission, vasopressor use and renal replacement therapy, higher APACHE II scores, but lower GCS than survivors.

Among the respiratory sampling, Acinetobacter and Klebsiella were predominant and 35.49%, 18.86% respectively. Non-survivors had higher admission heart rates and high respiratory rate, and higher CPR and procalcitonin level, lactate level and lower PO₂/FiO₂ ratios, low pH and albumin levels than surviving patients. Median ICU length of stay were 6 days (IQR, 4–9 days). Non-survivors had APACHE II score higher than survivors (29.5±3.8, 21.2±6.9 P<0.001).

Conclusions: All patients were COPD with acute hypercapnic respiratory failure and ICU mortality rates among all COPD patients (n=53) were 22.68% and APACHE II score higher among the non-survivor.

Key Words: acute hypercapnic respiratory failure; chronic obstructive pulmonary disease exacerbation; mechanical ventilation; mortality; PaO₂/FiO₂ ratio

INTRODUCTION

It has been estimated that COPD, currently the sixth leading cause of death worldwide, will have become the third leading cause of death by 2020.¹ The pooled COPD prevalence among Bangladeshi adult was 12.5%.²

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