seen in our study compared to other published data (mean APACHE II score: 25; 23% with MOF, 25% in septic shock, lactic acidosis, and 43% with acute renal failure).[28]

Consistent with the previous literature, the leading causes of acute hypercapnic respiratory failure in COPD patients in this study were acute COPD exacerbation, pneumonia, and heart failure. Afessa et al. 23 reported that 58% of patients were diagnosed with acute COPD exacerbation, followed, in order to prevalence, by pneumonia (23%) and cardiovascular diseases (10%). Pincelli et al.25 reported that 45.8% of patients had an acute COPD exacerbation, 33.3% had pneumonia and 12.5% had cardiovascular events. Ucgun et al.'s prospective study26, including COPD patients, revealed COPD exacerbation (49.9%), pneumonia-sepsis (29.2%), and cardiac failure (15.9%) as the main three reasons for acute hypercapnic respiratory failure. A study of 1016 patients by Connors et al.11 reported that the main reasons for acute respiratory failure in severe COPD were infection (51.3%) and heart failure (25.7%), followed by arrhythmias (4.8%). Several studies excluded COPD patients who had respiratory failure due to pneumonia, heart failure, pulmonary embolism, and other known conditions.[3,9,10,12,27]

Studies including patients with pneumonia, heart failure, pulmonary embolism, and other known causes have reported high in non-survival group increase ICU mortality rates, as also seen 22.64% in the present study. ICU mortality rate increased to 25% in these studies.[13,25,26] Patients being on mechanical ventilation having a mortality rate ranging between 26– 82%. [10,23,27,29,30] Our results are close to these of Seneff et al.[10] who reported a mortality rate of 24% in a cohort of COPD patients that were intubated on the first day in ICU in almost half the percentage than our patients (47%). Furthermore, in another study10, authors reported an ICU mortality rate of 50% in a cohort of COPD patients, of which 11.7% were intubated upon admission.

NIV failure is higher in non-survival group. And HFNC used in in fewer cases where NIV failure is predominant. Clinical assessment judged HFNC-treatment to be successful in 61% of the patients.[31]

In 78% of the patients, lower respiratory infection was the commonest cause of AECOPD. Acinetobacter baumannii, Pseudomonas aeruginosa, and Klebsiella pneumoniae were the commonest pathogens isolated from bronchial aspirates. This finding is in line with previous studies showing the prevalence of Gramnegative bacteria in the sputum samples of patients with severe and very severe COPD during the course of an exacerbation.32-34 In the studies of Li et al [32] and Eller et al [33], the isolation of Gram-negative pathogens including A. baumannii, P. aeruginosa, K. pneumoniae and members of the Enterobacteriaceae family were higher in severe and very severe patients.

The current study identified admission serum albumin low in non-survival group, Connor et al.'s prospective study11 identified serum albumin measured within the first 24 hours of admission as an inhospital mortality predictor in severe COPD patients with acute exacerbation. Admission albumin levels were also described as an ICU mortality predictor in Ai-Ping et al.'s retrospective study[3] of critically ill COPD patients with acute respiratory failure. Critical illness generally has an acute phase response which causes low serum albumin levels, either by changing the distribution of albumin between intravascular and extravascular compartments or by altering the synthesis and degradation of albumin.[35] The serum albumin level is a good indicator of the severity of a disease and hypoalbuminemia is generally associated with poorer outcomes in critically ill patients.[36]

The admission PaO2/FiO2 ratio also emerged as an important ICU mortality predictor in this study. Connors et al.11 identified the PO2/FiO2 ratio as one of the hospital mortality predictors in multivariate logistic regression analysis in COPD patients with acute exacerbation. Other authors have analyzed the effect of PaO2 on mortality, but not that of the PaO2/FiO2 ratio, and have not observed any relationship between mortality and PaO2.3,10,26,27 The PaO2/FiO2 ratio is a quantitative index of the severity of lung disease used in cases with acute respiratory distress syndrome and demonstrates