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ABSTRACT

Prognostic Factors Associated with Mortality in Critically Ill Patients with COVID-19 Admitted to A Tertiary Care Centre: A Prospective Observational Study

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Introduction

COVID-19 is an infectious disease caused by SARS-CoV-2 virus which has affected millions of people worldwide. Most cases present with mild symptoms with a minority progressing to severe illness[1]. Prognostic factors help to stratify patients based on their risk of severe disease or death and helps in optimizing management and resource utilization strategies. Various factors were previously assessed but factors like the effect of oxygen therapy, total dose of steroids, ventilation strategies, effect of glycemic status and hospital acquired infections on outcomes were not evaluated in our local population[2].

Objectives

Primary objective was to identify factors (clinical and biochemical markers) associated with in-hospital all-cause mortality. Secondary objectives were to identify factors associated with length of ICU stay, length of hospital stay and duration of invasive mechanical ventilation.

Materials and methods

This study was conducted as a prospective observational study over a period of 11 months at Iqraa International Hospital and Research Centre. Critically ill adult patients of either sex who tested positive for SARS-CoV-2 virus by RTPCR/RAT were included in the study. Patients received from another hospital on mechanical ventilation, those expected to survive for <24 hours and those who have received treatment from another hospital for >24 hours were excluded. Data were collected on demographics, comorbidities, medications received including steroids, oxygen support and delivery devices, admission severity scores, laboratory and radiological parameters and clinical outcomes. Data were collected on the day of admission, on the day of discharge from ICU and on the day of discharge from hospital or in-hospital death.

Results

A total of 90 patients were included in the study of which 66.7% were males and 58.9% were of age > 60 years. 82.2% became antigen negative with duration of antigen conversion ranging from 10-41 days. 33% of patients required invasive mechanical ventilation. Oxygen delivery index ranged from 20-444. 10% of patients underwent tracheostomy. 46.6% required hemodynamic support for at least one day. All patients received steroids with prednisolone equivalent steroid days ranging from 64-4169. 57% patients had at least one HAI. 32.2% of patients had oxygen dependency at discharge. Of the 90 patients, 34.4% had in-hospital mortality. After logistic regression analysis, requirement of hemodynamic support for at least one day, at least one airway manipulation and presence of at least one ventilator day was found to be associated with mortality. The presence of at least one HAI and a prednisolone equivalent steroid day of >1000 was found to be associated with a prolonged ICU length of stay (>10 days) and prolonged hospital length of stay (>15 days). The presence of at least one HAI was also found to be associated with increased duration of mechanical ventilation (>48 hours).

Discussions

The in-hospital mortality rate in our study was 34.4%. The requirement of at least one ventilator day, at least one hemodynamic support day and at least one airway manipulation was found to be significantly associated with mortality. Oxygen delivery index and prednisolone equivalent steroid days were not found to be significantly associated with mortality. The incidence of HAI was higher in this population with 57% patients having at least one HAI. The presence of at least one HAI was associated with increased duration of ICU stay, hospital stay and mechanical ventilation duration.

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