Factors Affecting Mortality in Critical Patients Admitted to Intensive Care Unit Due to Coronavirus Disease 2019

NCT number: NCT04659876

Date: 11.09.2020

Study Design, Population, and Data

Critical patients hospitalized due to COVID-19 in ICU of the University of Health Sciences Turkey, Diyarbakır Gazi Yaşargil Training and Research of Hospital between March 22 and September 1, 2020, were included in this study. The study was approved by the Ethics Committee of University of Health Sciences Turkey, Diyarbakır Gazi Yaşargil Training and Research of Hospital (No: 550, 11.09.2020). The trial was registered with clinicaltrials.gov (NCT04659876). This retrospective cohort study was conducted in accordance with the 2008 Declaration of Helsinki criteria.

Critical patients diagnosed with COVID-19 on the dates specified, followed up in ICU, aged >18 years, in serious need of oxygen support according to WHO and the temporary guidelines of T.C. Science Board of the Ministry of Health [presence of fever, muscle/joint pain, cough, and sore throat; tachypnea (30 breaths/min) or dyspnea; use of extra respiratory muscles; SpO2 level below of ≤90% in room air; bilateral diffuse pneumonia symptom detected on chest radiography or computerized tomography (CT); and PaO2/ FiO2 ratio of<300], and developed or had complications including severe pneumonia, ARDS, sepsis/septic shock, and acute renal failure were included in the study. Patients with COVID-19 aged <18 years with mild-to-moderate symptoms, no respiratory distress, and no signs of diffuse pneumonia on chest X-ray or CT as well as ICU patients excepted from COVID-19 diagnosis were excluded from the study. In addition, patients whose complete data could not be accessed from the hospital system or the patient file records were excluded. When the patients were admitted to ICU for the first time, their clinical conditions were evaluated with APACHE II and SOFA scores, and the degree of renal failure was evaluated using the Kidney Disease: Improving Global Outcomes (KDIGO) classification. Age; sex; comorbidity; ABO and Rh blood groups; APACHE II and SOFA scores and KDIGO stage during admission to ICU; hemogram parameters [white blood cell (WBC), neutrophil, lymphocyte, neutrophil/lymphocyte (N/L) ratio, hemoglobin, hematocrit, and platelet count]; blood gas values [pH, partial oxygen pressure (PO2), partial carbon dioxide pressure (PCO2), bicarbonate (HCO3), and lactate]; coagulation parameters [prothrombin time (PTZ) and D-dimer]; blood biochemistry results [creatine kinase (CK), lactate dehydrogenase (LDH), C-

reactive protein (CRP), urea, creatinine, alanine aminotransferase (ALT), aspartate aminotransferase (AST), total bilirubin, direct bilirubin, and indirect bilirubin]; and procalcitonin (PCT) and ferritin levels of the patients were recorded. Moreover, the length of stay in ICU and whether the patient died or survived were recorded. Patient data were rechecked for erroneous information before the last data entry and entered into a computerized database.

Patients were divided into two groups—those who survived (Survivors) and those who died (Non-survivors) during ICU follow-up. Both groups were compared in terms of clinical characteristics; APACHE II and SOFA scores and KDIGO stage; and laboratory values at the first admission to ICU. We attempted to determine the factors that affect mortality in critically ill patients hospitalized in ICU with COVID-19 diagnosis.

Statistical Analysis

SPSS 16.0 software for Windows (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Continuous data were expressed as means (SD or minimum–maximum), and categorical data were expressed as frequencies with percentages. Comparison of categorical data in the groups was performed using chi-square and Fisher's exact test, and the results were presented as n%. Kolmogorov–Smirnov test was used to determine whether the numerical data fit the normality distribution. Data conforming to the normality distribution were evaluated using Student t-test, and Mann–Whitney U and Kruskal–Wallis tests were employed to compare data that did not fit the normality distribution. Binary logistic regression was performed for the risk factors that were found to be significant in the univariate analysis. Odds ratio (OR) with 95% confidence interval (CI) was used to report the association between mortality and exposure to the risk factors. In all comparisons, P value of <0.05 was considered significant.