

Evaluation of laboratory value changes in the plasma of the covid-19 patients admitted to intensive care units prior to and after plasmapheresis

Abstract

Background: With the emergence and global spread of the 2019 coronavirus disease and the inability of health care systems to control it, various therapeutic approaches were presented to deal with this disease, plasmapheresis therapy being one of them. Despite the use of this treatment approach during the pandemic, there is still insufficient information on its effects.

Aim: To evaluate the laboratory value changes in the plasma of the covid-19 patients admitted to intensive care units prior to and after plasmapheresis.

Materials and methods: In this cross-sectional study, the information of 313 patients with severe covid-19 who have been hospitalized since June 2019 based on the presence of positive symptoms of covid 19 in CT scan of the lung according to ground glass appearance or positive PCR of covid 19 and have the criteria of severe covid disease with the age range over 18 years old and did not respond to the usual treatments and were subjected to plasmapheresis treatment cycles entered the study. Demographic variables, clinical symptoms, comorbidities, drug use, laboratory findings of patients, including hematology and biochemical tests and inflammatory factors before and after plasmapheresis were collected from the patients' files and recorded in the relevant checklist.

Results: 196 patients (62.6%) were male and 117 patients (37.4%) were female. The most common clinical symptoms were dyspnea (89.5%), cough (36.7%), and fever (27.2%), and the most common underlying diseases were hypertension (28.1%) and diabetes (25.2%). 134 patients (42.8%) died. The amount of changes in WBC ($P=0.006$), Hb ($P=0.002$), Plt ($P<0.001$), LDH ($P=0.001$), Ferritin ($P=0.041$), Cr ($P<0.001$), Bun ($P<0.001$), and AST ($P=0.009$) after plasmapheresis had a significant difference between surviving and deceased patients, but it was not related to the gender of the patients ($P>0.05$).

Conclusion: The results obtained in this study showed evidence in favor of plasmapheresis therapy in covid-19 patients with severe conditions hospitalized in intensive care units, so that after plasmapheresis, biomarkers representing the

acute phase reaction and inflammation were significantly reduced; white blood cell count was significantly increased; and the markers of kidney and liver function were improved and finally this treatment approach was associated with a survival rate of 57.2% in these patients.

Keywords: Plasmapheresis, covid 19, cytokine storm.