

EVALUATION OF CARDIAC PARAMETERS AND ANTIOXIDANT ENZYMES IN SEVERE COVID-19 INFECTIONS: CARDIO-COMPLICATIONS AND ADVERSE CONSEQUENCES

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Abstract

Cardiovascular complications are the possible explanation for increased mortality related to Covid-19 pandemic. Multiorgans dysfunctions are common such as cardiac damage, kidney failure and gastrointestinal malfunction due to COVID-19 infection and induced digestion food disorders and bad appetite. Consequently, cardiac injury that is attributed to anemia and hypoxia and loss of many vitamins and essential minerals. On another hand, the COVID-19 pandemic caused a big economic problem and agricultural difficulties, reduced the production of food, and caused adverse effects on transporting foods. This research aims to understand the important adverse outcomes of cardiac manifestations and possible pathological mechanisms of cardiac injury in severe Covid-19 infection to assist the physician to modify the strategy protocol of treatment.

The study included 60 patients and 30 as a control group. The data and blood samples were collected from Covid-19 cases hospitalized between October 2021 and April 2022. The statistical results were gained by IBM SPSS-26 statistical software.

The statistical data observed that all of the following biomarkers: troponin-I(CTN-I), creatinin kinase-MB (CK-MB) and lactate dehydrogenase (LDH) and myoglobin (MYO), had elevated values in severe Covid-19 cases, and were with extreme clinical significance ($p < 0.001$) when compared to the healthy group. Additionally, the malondialdehyde (MDA), and myeloperoxidase (MPO) were significantly higher (p value < 0.05) in the Covid-19 infected group as compared to the healthy group with. Meanwhile, the result showed a decrease in glutathione (GSH) and catalase (CAT) levels with significant differences ($p < 0.05$). Moreover, the levels of CTN-I, CK-MB, LDH, MYO, and MPO were elevated with decreased GSH value in non-survival group as compared to the survival group, with a high clinically significant difference ($p < 0.001$) and the mortality rate was 51.67%. These results revealed that the biomarkers underlying are considered essential diagnostic and prognostic markers of cardiac damage which induced by Covid-19 infection. Furthermore, receiver operating characteristic (ROC) curve performance referred that the CTN-I had the highest area under the curve (AUC) at (1.00) with 100% of sensitivity, specificity and accuracy and was considered as the best discriminatory power as compared with another test. Followed by MYO where the AUC was at 0.990.

In conclusion, adverse consequences of Covid-19 infection had related to induced cardiovascular events and heart injury with a high rate of mortality.

Key words: Covid-19 and cardiac damage, Antioxidant enzymes and Covid-19, Cardiovascular dysfunction, Mortality in Covid-19.