

Prevalence of COVID-19 associated cytokine storm in diabetic versus non diabetic patients

Abstract

Introduction: COVID-19, a global pandemic has created a worldwide disaster since its first outbreak in December 2019 in Wuhan, China. Diabetic patients with COVID-19 have a worse prognosis and increased mortality. Cytokine storm is an aggressive inflammatory response to the SARS-CoV-2 virus and is associated with lung damage, multiple organ failure, and a bad COVID-19 prognosis.

Aim of the study: The study aimed to evaluate the levels of some cytokine storm parameters in COVID-19 infection, besides a comparison of these levels between diabetic and nondiabetic Egyptian patients.

Subjects and Methods: the current cross-sectional study recruited 80 adult individuals. All patients were divided into two groups: 42 diabetic patients with COVID-19 and 38 nondiabetic patients with COVID-19. Patients with diseases of inappropriate cytokine inflammatory load, such as autoimmune diseases or malignancies, were excluded. The medical history and clinical examination were performed. The cytokine storm inflammatory markers, such as C-reactive protein (CRP), Ferritin, Lactate dehydrogenase (LDH), D-dimer, Neutrophil-Lymphocyte Ratio (NLR), and Interleukine-6 (IL-6) were tested, in addition to the examination of the Glycemic state: HBA1C, FBS, and 2HPP. Duration of hospital admission and mode of respiratory support were recorded.

Results: The results showed that 61% of diabetic patients needed more intensive care unit (ICU) admission than 36.8% of non-diabetics ($P=0.025$). The mean serum level of IL-6 was 126.55 ± 45.65 pg/ml in diabetic patients compared to 99.58 ± 52.77 pg/ml in non-diabetic, which was statistically significant ($P=0.033$). The ROC curve analysis showed that IL-6 was a significant marker of mortality ($P<0.001$) with a cut-off level >136 pg/mL at 95.65% sensitivity and 87.72% specificity. Furthermore, HBA1C was a significant marker of mortality ($P<0.001$) with a cut-off value >7.8 % at a sensitivity of 65.22 % and specificity of 63.16 %.

Conclusion: Our study confirmed that diabetic patients had significantly earlier onset of cytokine storm, higher inflammatory response, longer hospital admission duration, higher admission rate to ICU, and more need for mechanical ventilation compared to non-diabetics.