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Cytokine Storm and COVID-19: A Short Communication

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Colony-Stimulating Factors (CSF), Interferon (IFN), Tumor Necrosis Factor (TNF), Cytokine storm, Inflammatory, Therapeutic

Ctokines are small glycoproteins produced by many different types of cells in the body. When released, cytokines can promote a wide range of functions, some of which involve the control of cell proliferation and differentiation, autocrine, paracrine and/or endocrine activity, as well as endocrine regulation of immune and inflammatory responses. Some of the most studied cytokines include Interferon (IFN), interleukins, chemokines, Colony-Stimulating Factors (CSF), and Tumor Necrosis Factor (TNF). The first documented use of the term "cytokine storm," also known as hypercytosis, appeared in a 1993 paper discussing graft-versus-host disease. Since 2000, however, cytokine storms have been referred to in various infectious diseases, which is why the term is most commonly used to describe an uncontrolled inflammatory response of the immune system [1]. The term "cytokine storm" conjures vivid images of a malfunctioning immune system and out-of-control inflammatory response. The term has captured the attention of the public and the scientific community and is increasingly used in both the mass media and the scientific literature. However, while the general concept of excessive or uncontrolled release of proinflammatory cytokines is known, there is still a lack of a realistic definition of what constitutes a cytokine storm. In addition, there is no good understanding of the molecular events that cause a cytokine storm, the contribution of such a "storm" to the pathogenesis, or the therapeutic strategies that can be used to prevent storm or appease when it begins [2].

Symptoms of a cytokine storm are varied and can include: Fever and chills, Tired, Swollen extremities, Nausea and vomiting, Muscle and joint pain, Headache, Rash, Cough, Shortness of breath, Fast breathing, Convulsion, Concussion, Difficulty coordinating movements, Confusion and hallucinations and Lethargy and poor reaction. Very low blood pressure and increased blood clotting can also be signs of severe cytokine storm syndrome. The heart may not pump as well as it should. Thus, cytokine storms can affect multiple organ systems [3].

The novel COVID-19 continues to challenge health systems worldwide, and the scenario continues to escalate. COVID-19 poses an increasing threat to humans with a death rate of 6.4% to date. COVID-19 infection is accompanied by an active inflammatory response with the release of large amounts of pro-inflammatory cytokines in an event known as a "cytokine storm". The host immune response to the SARS-CoV-2 virus is overactive, leading to an overactive inflammatory response. Several studies analyzing the cytokine profiles of patients with COVID-19 have suggested that cytokine storm is directly associated with lung injury, multiple organ failure, and poor prognosis of severe COVID-19 [4].Why is "cytokine storm" so closely related to COVID-19? During the SARS outbreak caused by SARS-CoV-1, the term cytokine storm was described as a hallmark and associated with adverse events. Several initial COVID-19 case series reported elevated plasma levels of certain cytokines above normal. However, in most cases, they were lower than the plasma concentrations of previous ARDS patient populations. Interleukin-6, an inflammatory cytokine, is a key mediator in the acute inflammatory response and is known as a cytokine storm [5].

Elevated serum cytokine levels in patients with a cytokine storm associated with Covid-19 including interleukin-1β, interleukin-6, IP-10, TNF, interferon-γ, Macrophage Inflammatory Protein (MIP) 1α and 1β and VEGF. Higher levels of interleukin-6 were strongly associated with shorter survival time. The relative frequencies of circulating activated CD4+ and CD8+ T cells and plasmablasts are increased in Covid-19. In addition to elevated levels of systemic cytokines and activated immune cells, several clinical and laboratory abnormalities, such as elevated CRP and d-dimer levels, hypoalbuminemia, dysfunction renal function and effusion, also seen in Covid-19, when they were in a stormy state. dysregulation of cytokines. Lab test results reflecting hyperinflammation and tissue damage have been shown to predict worsening outcomes in Covid-19. General treatment strategies for cytokine storm include supportive care to maintain vital organ function, control underlying disease, and eliminate aberrant and immunomodulatory immune system triggers, targeted or nonspecific immunosuppression to limit collateral damage of the activated immune system [6].

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