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Carta al editor

Cytokine-dependent inflammatory response in SARS-CoV-2 infection

Respuesta inflamatoria dependiente de citoquinas en la infección por SARS-CoV-2

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Dear Editor,

COVID-19 still represents a challenge, and a periodic update is necessary, mainly on its pathophysiology as an inflammatory-based disease.

Inflammation is the basis of different clinical entities, and the main reason for consultation in Cuba and the world; known term, commonly seen as a symptom or a risk factor, with an erroneous perception that it is an isolated entity.(1) Both the innate and the acquired immune response act in this process with


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numerous local and systemic effects, being a response body homeostasis where the functions of almost all organ systems are modified.[2]

Different molecules favor its development, such as vasoactive substances, chemokines, lipid metabolites, immunoglobulins, as well as the kinin, coagulation and complement systems, but the main molecules are cytokines;[3] small peptides that function as intercellular messengers.

A crucial role is then played by anti-inflammatory cytokines, made up of T-helper 2 lymphocytes, producers of interleukins (IL) 10, 13, 24 and 42, responsible for bringing the defensive response to normal.[4]

Knowing the role of cytokines in inflammation is essential to understand the specific expression of inflammatory-based pathologies, which could mean a significant shift in the management of infectious diseases such as COVID-19.

The arrival of the new coronavirus has generated an unbridled use of epidemiological resources to contain it; however, it will be impossible if the biopsychosocial factors and the conditions of the immune response that are triggered in response to the disease are not known.[5]

SARS-CoV-2 is capable of activating the immune system, giving rise to an uncontrolled systemic inflammatory response, due to the production and secretion of pro-inflammatory cytokines and chemokines by immunoeffector cells. This "cytokine storm" is key in the pathophysiology of lung damage, hemodynamic instability, multi-organ failure, and the lethality observed in these patients.[5]

Cytokine storm is a term that, although recently in widespread use, lacks a strict definition. It refers to the overproduction of inflammatory substances with a wide range of biological activity from a variety of tissues and cells, as a result of an infectious process and the loss of negative feedback on the immune system.[6]

A cytokine storm is suspected in all patients with symptoms and signs of COVID-19, associated risk factors, and a torpid course of the disease. It should be taken into account that this entity is associated with a marked elevation of IL-6 (poor prognosis factor in adults with COVID-19) and IL-1, hence the treatment should be aimed at reducing the state of hyperinflammation.[4]

The cytokine storm is not a new concept to immunologists and clinicians, even though it has become more widely known in the wake of COVID-19. They occur in other infections, in autoimmune diseases,

and in people with certain "faulty" genes. However, although it is a previously known term, it is still under study, and many of its treatments are still in the experimental phase.

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