

ASSERTION OF A DIDACTIC ILLUSTRATIVE SCHEME OF THE HYPERINFLAMMATORY RESPONSE IN COVID-19

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Marcos Jessé Abrahão Silva^{1,*}, Layana Rufino Ribeiro², Maria Isabel Montoril Gouveia², Beatriz dos Reis Marcelino², Karla Valéria Batista Lima², Luana Nepomuceno Gondim Costa Lima²

¹ Graduate Program in Epidemiology and Health Surveillance (PPGEVS), Evandro Chagas Institute (IEC), Ananindeua 67030-000, PA, Brazil.

² Bacteriology and Mycology Section, Evandro Chagas Institute (IEC), Ananindeua 67030-000, PA, Brazil.

* **Correspondence:** jesseabrahao10@gmail.com

Abstract

COVID-19 is a multisystemic disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The immunopathogenic conditions of the hyperinflammatory response that cause systemic inflammation are extremely linked to its severity. This research sought to review and build a didactic model about the immunopathological elements that contribute to its progression. This is a systematic review using the PUBMED, LILACS, MEDLINE, and SCIELO databases through articles of the types of clinical trials, case-controls, *in vitro* trials, case reports, cohort, case-control, cross-sectional studies, reviews, and experimental studies between May 2020 and July 2022 with the following search terms in conjunction with “AND”: “SARS-CoV-2”; “COVID-19”; “ARDS” and “Cytokine Storm”. The quality appraisal and risk of bias were assessed by the JBI checklists and the Cochrane Collaboration’s RoB 2.0 and ROBINS-I tools, respectively, and the risk of bias for *in vitro* studies by a pre-defined standard in the literature. From this, the schematic construction was made on paper with office supplies, and, therefore, its digitization and painting in Adobe Photoshop CS6 program. The search resulted in 39 articles. The main actors in this response denote SARS-CoV-2 Spike proteins, cellular proteases, leukocytes, cytokines, and proteolytic cascades. The “cytokine storm” itself brings several complications to the host through cytokines such as IL-6 and chemokines (such as CXCL10), which influence tissue inflammation through apoptosis and pyroptosis. There is an increase in several clinical parameters in patients, such as D-dimer, alanine aspartate aminotransferase (AST), alanine aminotransferase (ALT), C-reactive protein (CRP), ferritin, and lactate dehydrogenase (LDH). The hyperinflammatory response causes several unfavorable outcomes in patients, and systemic inflammation caused largely by the dysregulation of the immune response should be controlled for their recovery.

Keywords: SARS-CoV-2; COVID-19; ARDS; cytokine storm; immunity