Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to Editors

Pentoxifylline and complicated COVID-19: A pathophysiologically based treatment proposal

To the Editor,

Accumulating evidence suggests that a subgroup of patients with COVID-19 might suffer from severe complications, such as acute respiratory distress syndrome (ARDS), coagulopathy with thromboses and acute cardiac injury, increasing the risk of mortality. A proposed common pathogenetic mechanism for these complications is a SARS-CoV-2-induced proinflammatory state (cytokine storm syndrome-CSS) [1]. Immunomodulatory medications such as inhibitors of interleukin (IL)-6 (tocilizumab) or IL-1 (anakinra) have been proposed as potential treatments for the CSS.

Pentoxifylline (PTX), a non-specific inhibitor of phosphodiesterases and well-established hemorheological factor, exhibits pluripotent properties which could be of value in the context of COVID-19-associated complications. First, PTX inhibits the synthesis of diverse pro-inflammatory cytokines (tumour necrosis factor-α, IL-1, IL-6) and prevents the activation, cell proliferation, adhesion, polarisation and hemotaxis of T cells and neutrophils [2]. Second, PTX antagonizes the inhibitory effect of TNF-α on surfactant synthesis by human type II pneumocytes, which is a pivotal mechanism of ARDS pathogenesis [3]. Third, PTX inhibits platelet aggregation and promotes the fibrinolytic activity, which might decrease the risk of thromboses [4]. Fourth, it exerts cardioprotective actions mediated by its beneficial hemorheological, anti-platelet and anti-inflammatory properties [5]. Its antiviral activity against SARS-CoV-2 has not been tested, but PTX exerts potent in vitro activity against HIV, herpes simplex virus, rotavirus and tick-borne encephalitis virus [6].

To our opinion, this profile of actions of PTX is identically harmonized with several levels of the pathophysiology of COVID-19-associated complications, justifying its trial for the prevention or treatment of severe COVID-19.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Stelios F. Assimakopoulos*, Fotios Seintis, Markos Marangos
Department of Internal Medicine, Division of Infectious Diseases, University of Patras Medical School, Patras, Greece
E-mail address: sassim@upatras.gr (S.F. Assimakopoulos).

* Corresponding author at: Department of Internal Medicine and Division of Infectious Diseases, University of Patras Medical School, Patras 26504, Greece.

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