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LETTER

Can Ivermectin be Useful for COVID-19 Management as an Immunomodulating Agent?

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Abstract:

The possibility of using ivermectin in the treatment of COVID-19 as an immunomodulating agent, has been discussed, which may prevent life-threatening virally driven cytokine storm syndrome.

Keywords: COVID-19, Ivermectin, NF-κB, Cytokine, Cytokine storm syndrome, Immunomodulator.

Article History

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Dear Editor,

COVID-19 is an emerging and rapidly evolving situation in the world.

The recent report of Caly *et al.*, (2020) [1] stated that an anti-parasitic medicine ivermectin has antiviral action against the SARS-CoV-2 virus (a causative agent for COVID-19) clinical isolate *in vitro* and it is worthy of further consideration as a possible SARS-CoV-2 antiviral drug.

Ivermectin is a well-known anti-parasitic drug with a broad spectrum of activity, high efficacy as well as a wide margin of safety [2].

It is approved by the U.S. FDA for managing such parasitic infections like strongyloidiasis and onchocerciasis [3]. Evidence suggests that oral ivermectin may be a safe and effective treatment for scabies as well; however, ivermectin is not U.S. FDA-approved for this use [4].

Accumulating evidence suggests that a subgroup of patients with severe COVID-19 might have a cytokine storm syndrome [5].

Predictors of fatality from a recent retrospective, multicenter study of 150 confirmed COVID-19 cases in Wuhan (China) suggest that mortality might be due to virally driven hyperinflammation [6].

The transcription factor NF-κB regulates multiple aspects of innate and adaptive immune functions and serves as a pivo-

tal mediator of inflammatory responses. NF-κB induces the expression of various pro-inflammatory genes, including those encoding cytokines and chemokines [7].

Jiang *et al.*, (2019) in their study found that ivermectin at its very low dose, which did not induce obvious cytotoxicity, drastically reversed the resistance of tumor cells to the chemotherapeutic drugs both *in vitro* and *in vivo* by inhibition of the transcriptional factor NF-κB and could potentially be used in combination with chemotherapeutic agents to treat cancers and in particular, drug-resistant cancers [8]. Prior to them, Zhang *et al.*, (2009) indicated that ivermectin might inhibit lipopolysaccharide (LPS)-induced production of inflammatory cytokines by blocking the NF-κB pathway and improving LPS-induced survival in mice [9].

Summarizing all the information, ivermectin could be considered for a clinical trial to determine its efficacy in the management of COVID-19 as an immunomodulating agent which might prevent life-threatening virally driven cytokine storm syndrome.

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