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Review [Biomed Pharmacother.](#) 2020 Dec;132:110886. doi: 10.1016/j.bioph.2020.110886.

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Potential of natural astaxanthin in alleviating the risk of cytokine storm in COVID-19

Jayanta Talukdar ¹, Bhaskar Bhadra ², Tomal Dattaroy ², Vinod Nagle ², Santanu Dasgupta ²

Affiliations

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Abstract

Host excessive inflammatory immune response to SARS-CoV-2 infection is thought to underpin the pathogenesis of COVID-19 associated severe pneumonitis and acute lung injury (ALI) or acute respiratory distress syndrome (ARDS). Once an immunological complication like cytokine storm occurs, anti-viral based monotherapy alone is not enough. Additional anti-inflammatory treatment is recommended. It must be noted that anti-inflammatory drugs such as JAK inhibitors, IL-6 inhibitors, TNF- α inhibitors, colchicine, etc., have been either suggested or are under trials for managing cytokine storm in COVID-19 infections. Natural astaxanthin (ASX) has a clinically proven safety profile and has antioxidant, anti-inflammatory, and immunomodulatory properties. There is evidence from preclinical studies that supports its preventive actions against ALI/ARDS. Moreover, ASX has a potent PPARs activity. Therefore, it is plausible to speculate that ASX could be considered as a potential adjunctive supplement. Here, we summarize the mounting evidence where ASX is shown to exert protective effect by regulating the expression of pro-inflammatory factors IL-1 β , IL-6, IL-8 and TNF- α . We present reports where ASX is shown to prevent against oxidative damage and attenuate exacerbation of the inflammatory responses by regulating signaling pathways like NF- κ B, NLRP3 and JAK/STAT. These evidences provide a rationale for considering natural astaxanthin as a therapeutic agent against inflammatory cytokine storm and associated risks in COVID-19 infection and this suggestion requires further validation with clinical studies.

Keywords: Acute respiratory distress syndrome; Anti-inflammatory; Antioxidant; Astaxanthin; COVID-19; Cytokine storm.

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Figures



Graphical abstract



Fig. 1 Schematic representation of the putative...

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