



Letter to Editors

COVID-19 & Periodontitis: The cytokine connection



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ABSTRACT

COVID-19 is now recognized as a pandemic throughout the world, leading to a scramble in order to gather knowledge as well as evidence regarding the 'novel' corona virus which causes this disease.

Chemokines are a family of cytokines which are chemotactic in nature and cause the recruitment of cells of inflammation.

Periodontitis has long been attributed to having its pathophysiology rooted in a cytokine response. The recent COVID-19 pandemic has been reported to have adverse outcomes related to the establishment of a cytokine storm, many of the components of which are common with the cytokine expression profile of periodontitis. This communication explores the connection between COVID-19 and periodontal disease through their cytokine connection to form a translational basis for recommending maintenance of oral hygiene in the COVID era and to red flag patients with periodontitis as having an increased risk of exhibiting COVID related adverse outcomes.

COVID-19 is now recognized as a pandemic throughout the world, leading to a scramble in order to gather knowledge as well as evidence regarding the 'novel' corona virus which causes this disease.

Chemokines are a family of cytokines which are chemotactic in nature and cause the recruitment of cells of inflammation.

A number of pathophysiological mechanisms have been put forth to explain its behavior. One of which is the fact that its symptoms seem to be related to a 'cytokine storm' which exhibits itself as elevated serum levels of IL-1 beta, IL-7, IL-10, IL-17, IL-2, IL-8, IL-9, GM-CSF, G-CSF, IFN-gamma, TNF alpha, MIP1A, MIP1B, MCP1 and IP10 [1]. Patients exhibiting an exaggerated form of symptoms necessitating ICU admission further show even greater levels of IL-2, IL-7, IL-10, IP-10, G-CSF, MIP1A, MCP1 and TNF alpha [1]. Elevated Th17 pathway responses have also been observed in patients of SARS-CoV and MERS-CoV [1]. Th17 type of inflammatory response is involved in the manifestation of the cytokine storm and adverse outcomes pertaining to pulmonary oedema and tissue damage in lung infections including that caused by SARS-CoV-2 [1].

Periodontal disease has long been regarded as a silent pandemic which has a complex multi-factorial pathophysiology with evidence based claims of immune mediated pathogenesis. There has been demonstration of increased IL-17 producing cells in gingival tissue of patients suffering from both gingivitis and periodontitis as compared to healthy controls, not only this, elevated levels of IL-17 have been found in the serum of patients suffering from periodontal disease as well [2]. This gives credence to the fact that elevated levels of cytokines detected in locally inflamed gingival tissue mirror cytokine levels in the systemic circulation [3]. There is also evidence in literature that non-surgical periodontal treatment leads to a fall in the levels of IL-17 both in the GCF (local) and serum (systemic) of patients with periodontal disease [3].

This common pathway of inflammatory response points towards a

possible association between Periodontitis and COVID-19 related adverse outcomes. Understanding of this association underscores the importance of keeping periodontal disease under check and the value of maintaining meticulous oral hygiene in the COVID-19 era. It also points towards the possibility of the presence of periodontal disease as predisposing towards COVID-19 related adverse outcomes.

Contribution statement

Both authors contributed equally to the conceptualization, design and review of the manuscript.

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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