

## LETTER TO THE EDITOR

# Neurological, haemodynamic and metabolic disturbs are prevalent symptoms in oral surgeons with post-COVID-19

Dear editor,

Post-COVID-19 is one of the most frequently reported complications in patients with a history of SARS-CoV-2 infection. Although the clinical signs and symptoms have been elucidated over time, the real mechanism and the possible sequelae still require further elucidation. In general, this clinical condition can express itself at different levels (from mild to severe) and remain with variable time.<sup>1</sup> The occurrence of this pathology is described both in patients and health professionals, especially those who work in the front line to fight the pandemic.<sup>1</sup>

During the initial peak of cases of coronavirus disease 2019 (COVID-19) in Brazil (1st semester of 2020), maxillofacial surgeons maintained urgency and emergency activities of public care. As a consequence of the high demand for hospital care jointly with service overload and viral load present in the environment, most professionals became susceptible to infection. From the total set of maxillofacial specialists involved, approximately 75% (15/20, 46.1 ± 5.2 years) were severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) positive and presented the most varied symptoms (fever, myalgia, headache, lack of appetite, diarrhoea, taste and smell change, amongst others). Subsequently, many of these professionals developed prolonged symptoms and organic alterations, compatible with clinical features of the post-COVID-19.

Amongst the set reported symptoms, neurological disorders (stress, depression, anxiety, memory and concentration loss, insomnia, tremors and fatigue), metabolic changes (hypoglycemia, hyperglycemia, thyroid disorders—hypo/hyperthyroidism) and haemodynamic disorders (pressure drop and hypertensive peaks) were the most prevalent symptoms. Physiologically, this varied symptomatology is caused by the fact that the novel coronavirus can infect several types of human cells mainly by linkage to ACE2 and TMPRSS2 receptors.<sup>2–4</sup> As a result, these professionals went through a medical follow-up, and currently, they have shown a significant improvement in their overall condition.

According to the expressions observed in the central nervous system after infection by SARS-CoV-2, the presence of residual viral load and spike proteins present in the cerebrospinal fluid of positive patients has been identified.<sup>5,6</sup>

Consequently, a wide spectrum of neuropsychiatric manifestations has been described, such as encephalitis, encephalopathy, neuromuscular junctions disorders and even Guillain-Barré syndrome.<sup>6</sup> The most commonly observed neurological alterations in patients after initial infection and independent of disease severity grade include 'brain fog', a subtype of cognitive dysfunction as well as anxiety and depression.<sup>7</sup>

In contribution, several studies have demonstrated the neuroinvasive potential of the novel coronavirus and its neurotropic capacity to induce neuronal death and dysfunction of astrocytes as observed in vitro study models.<sup>8,9</sup> Possibly, this mechanism may explain the main alterations observed in the nervous system level by most of the oral surgeons in our team.

In contrast, metabolic and haemodynamic disorders caused by the pathogen correspond to escape alternatives of the host's immune response, inducing severe tissue inflammation.<sup>10,11</sup> Also, SARS-CoV-2 is able of infects the pancreas through affinity for the ACE2 receptor triggering cellular damage to the organ's parenchyma and, thereafter, influencing insulin secretion and development of hypoglycemic frame, even in patients with no history of diabetes mellitus.<sup>11</sup> Regarding that, Pasquarelli-do-Nascimento et al.<sup>12</sup> reiterate that hypercoagulopathy and adipose tissue may exacerbate the inflammatory response of individuals predisposing higher risk of mortality, especially in more susceptible individuals.

To conclude, the post-COVID-19 frame may impact directly the physical and cognitive performance of patients and health professionals. Additionally, it might cause a significant decrease in quality of life, even daily activities. Therefore, it is crucial to develop methods and reliable tools for detecting this new clinical condition, especially emphasizing rehabilitation therapies and continuous follow-up to minimize possible sequels.

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## CONFLICT OF INTEREST


None to declare.

## AUTHORS' CONTRIBUTION

All authors developed the idea and contributed to the final version of the manuscript equally.

## ETHICS STATEMENT

None required.

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