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Compromised periodontal status could increase mortality for patients with COVID-19

In their active surveillance study of patients with COVID-19 in south India, Ramanan Laxminarayan and colleagues¹ reported an increased risk of death in patients who had a history of diabetes (adjusted hazard ratio 2.28, 95% CI 1.79–2.91), hypertension (2.08, 1.62–2.66), other circulatory disorders (3.89, 2.66–5.71), cancer (8.04, 3.47–18.65), or respiratory disorders (4.57, 2.43–8.61). Male sex, older age, and chronic kidney disease were also associated with higher mortality in individuals with COVID-19.¹

Here, we would like to add the possibility of a link between periodontal disease and COVID-19, which went unrecorded and might have played an important role through a direct correlation between periodontal compromise and the disease process in COVID-19 and through an indirect effect in worsening the status of underlying comorbidities. Periodontal disease is a notable contributor to the pathophysiology of numerous systemic conditions, including the ones recorded in the study by Laxminarayan and colleagues. Indeed, studies of the Indian population have established that periodontitis has a considerable effect on COVID-19-related adverse outcomes.^{2,3} It would hence serve one well to be reminded of the close connection between angiotensin-converting enzyme 2 receptors, SARS-CoV-2, and the oral cavity.

We gathered data from 78 patients reporting to the communicable diseases ward or admitted to the COVID-19 Care Centre of the Postgraduate Institute of Medical Education and Research, Chandigarh, India, between Jan 15 and Feb 20, 2021, after their COVID-19 status was confirmed by RT-PCR. Pregnant women, patients

younger than 18 years, and people who were either unwilling or not in a position to give written informed consent were excluded from our analysis. We recorded covariates (eg, age, sex, and smoking habits), COVID-19-related comorbidities or risk factors (eg, diabetes, hypertension, pulmonary disease, chronic kidney disease, cancer, coronary artery disease, and obesity), and other comorbidities. Comprehensive periodontal clinical examination, including gingival recession, probing depth, clinical attachment loss, and bleeding on probing, was done, and the patients were categorised as being periodontally healthy (n=27) or having gingivitis (n=21) or periodontitis (n=30). We recorded blood parameters relevant to COVID-19 progression and COVID-19-related complications, such as the presence of COVID-19 pneumonia, death due to COVID-19, type of hospital admission, and need of assisted ventilation.

Pairwise Z-testing (Bonferroni-corrected) revealed that significantly more people with periodontitis than those without died due to COVID-19 (appendix). Therefore, we suggest that periodontitis is not only associated with COVID-19-related outcomes^{2,3} but might also increase mortality in patients with COVID-19.

Compromised periodontal status has been found to correlate significantly with admission to intensive care units among patients with COVID-19.² Patients with severe periodontitis are at much higher odds of requiring hospital admission and ventilation, developing COVID-19 pneumonia, and dying after SARS-CoV-2 infection compared with COVID-19-positive patients with healthy gums.^{2,3} Bacterial superinfections are common in patients with severe COVID-19. Elevated concentrations of oral commensal bacteria have been noted from the meta-transcriptome sequencing of bronchoalveolar lavage fluid from severely ill patients with COVID-19.⁴ Hence, during this

pandemic, preventive public health interventions and any diagnostic or treatment modalities that can help to reduce oral biobload, thereby decreasing the risk of ventilation-induced complications, are needed.⁵ Maintenance of oral health should assume a greater importance. Further studies and clinical trials are required to increase our knowledge on the potential connection between periodontitis, COVID-19-related complications and mortality, and long COVID (ie, post-COVID-19 syndrome).

We declare no competing interests. The work underlying the data in this Correspondence was done as a part of routine COVID-19 diagnostic activity in the Regional Virus Diagnostic Laboratory under the Indian Council of Medical Research New Delhi by the Department of Virology, Post Graduate Institute of Medical Education and Research, Chandigarh, India.

**Shipra Gupta, Miina Saarikko, Andreas Pfützner, Ismo T Räisänen, Timo Sorsa*
gupta.shipra@pgimer.edu.in

Unit of Periodontology, Oral Health Sciences Centre, Post Graduate Institute of Medical Education and Research, Chandigarh 160012, India (SG); Department of Medicine and Dental Medicine, Karolinska Institutet, Stockholm, Sweden (MS, TS); Department of Internal Medicine and Laboratory Medicine, University for Digital Technologies in Medicine and Dentistry, Wiltz, Luxembourg (AP); Clinical Research Department, Pfützner Science & Health Institute, Mainz, Germany (AP); Department of Oral and Maxillofacial Diseases, University of Helsinki and Helsinki University Hospital, Helsinki, Finland (ITR, TS)

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See Online for appendix