

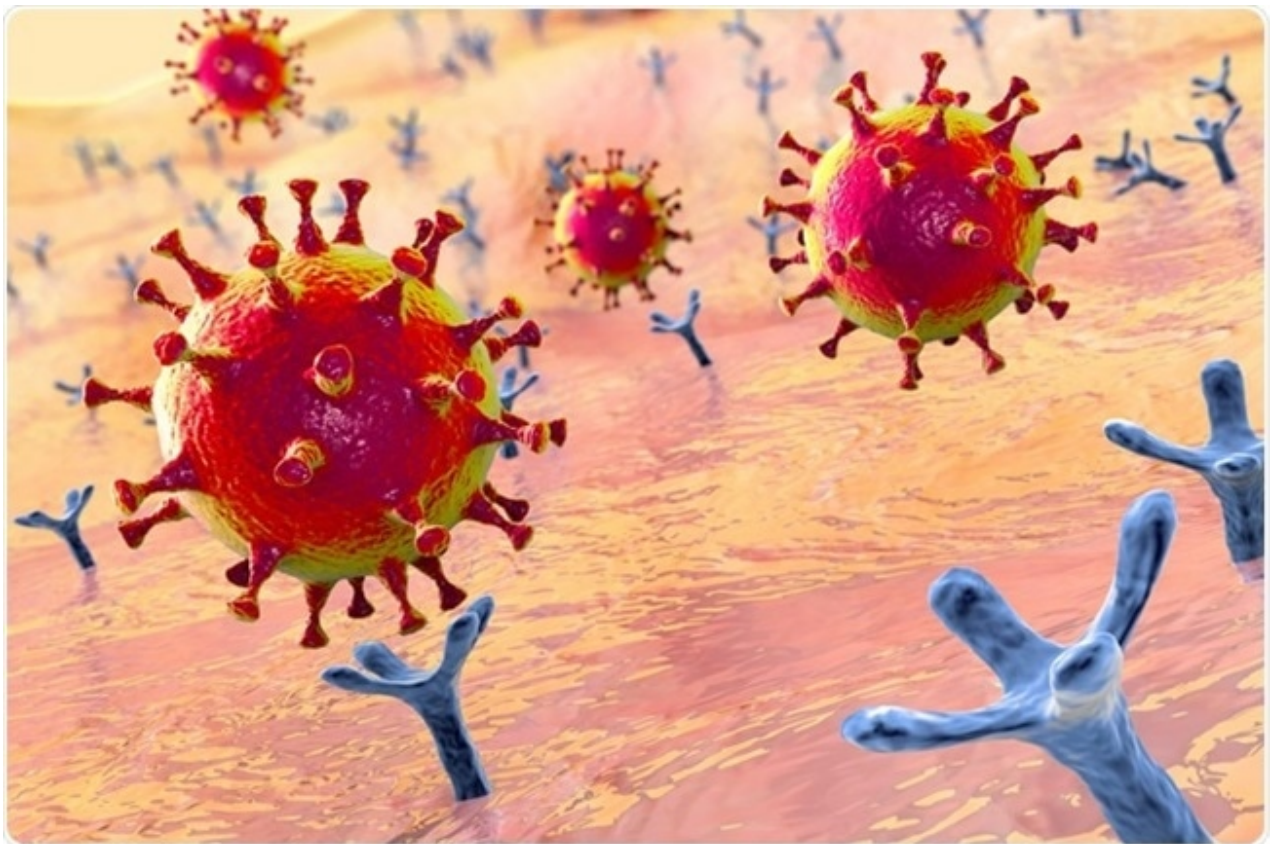
Oral hygiene and severity of COVID-19 – the connection



By Dr. Ananya Mandal, MD

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British researchers have found a link between poor oral hygiene and severity of COVID-19 disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. The study from researchers Victoria Sampson, from the dental practice 38 Devonshire Street, London, Nawar Kamona from the Centre for Nutrition Education & Lifestyle Management (CNELM), London and Ariane Sampson from Orthodontics, Cambridge University Hhospital Trust, United Kingdom collaborated to find the connection between the severity of the infection and poor oral hygiene. Their study titled, "Could there be a link between oral hygiene and the severity of SARS-CoV-2 infections?" was published in the latest issue of the journal British Dental Journal.



SARS-CoV-2 viruses binding to ACE-2 receptors on a human cell, the initial stage of COVID-19 infection. Illustration credit: Kateryna Kon / Shutterstock

The COVID-19 pandemic

Since December last year, there have been steadily increasing numbers of SARS-CoV-2 or novel coronavirus infection that causes COVID-19 disease. The World Health Organization (WHO) declared COVID-19 a global emergency on the 30th of January 2020 and, on the 11th of March 2020, declared it a pandemic when this highly contagious virus infected populations across the world. As of today, globally, 10,434,385 people have been infected and there have been 509,779 deaths attributed to the virus around the world due to this infection.

What was this study about?

Researchers to date have identified several risk factors that are associated with severe COVID-19 course of disease and outcome. While many patients infected with the virus recover without complications, some may need hospitalization, oxygen supplementation, and even ventilation. Some of the risk factors associated with poor outcome of the disease include high blood pressure, diabetes obesity, and heart disease. The team of researchers explains that 52 percent of the deaths due to COVID-19 also occur in healthy individuals, and the cause behind this is unclear. They wrote that the main complications of COVID-19 include “blood clots, pneumonia, sepsis, septic shock, and ARDS (Acute respiratory distress syndrome).” These complications are seen mainly among those with comorbidities and bacterial overload, they wrote.

Bacteria and COVID-19 outcome

The team speculates that there may be a connection between SARS- CoV-2 infection and “bacterial load.” They tried to explore if high levels of bacteria or bacterial superinfections and complications of bacterial infections such as pneumonia, sepsis, and respiratory distress syndrome could be associated with poor outcome from COVID-19.

Oral hygiene and COVID-19

This study explored the complications of COVID-19 seen among those with poor oral health and periodontal disease. The oral microbiome or the

microbial flora of the mouth was explored and its connection with the COVID-19 outcome was analyzed. The authors wrote, “We explore the connection between high bacterial load in the mouth and post-viral complications, and how improving oral health may reduce the risk of complications from COVID-19.”

The authors of the study wrote that during lung infection, there is a risk of aspirating the oral secretions into the lungs, which could cause infection. Some of the bacteria present in the mouth that could cause such infections include “*Porphyromonas gingivalis*, *Fusobacterium nucleatum*, *Prevotella intermedia*,” they wrote. They explained that periodontitis or infection of the gums is one of the most prevalent causes of harmful bacteria in the mouth. These bacteria lead to the formation of cytokines such as Interleukin 1 (IL1) and Tumor necrosis factor (TNF), which can be detected in the saliva and can reach the lungs leading to infection within them. Thus, the researchers wrote, “inadequate oral hygiene can increase the risk of inter-bacterial exchanges between the lungs and the mouth, increasing the risk of respiratory infections and potentially post-viral bacterial complications.”

Results of the study

The team wrote, “Good oral hygiene has been recognized as a means to prevent airway infections in patients, especially in those over the age of 70”. Those with periodontal disease are at a 25 percent raised risk of heart disease, thrice the risk of getting diabetes, and 20 percent raised risk of getting high blood pressure, the researchers wrote. These are all risk factors of severe COVID-19 they wrote.

Conclusions and implications

This study concludes that 20 percent of the patients with COVID-19 progress to severe illness with high levels of “inflammatory markers (IL-2, IL-6, IL-10), bacteria, and neutrophil-to-lymphocyte count”. They noted that the oral microbial environment and COVID-19 could be linked. The four essential risk factors for severe COVID-19, diabetes, high blood pressure, heart disease, and obesity, are also associated with poor oral hygiene, they wrote. They recommend “oral hygiene be maintained, if not improved, during a SARS-CoV-2 infection in order to reduce the bacterial load in the mouth and the potential risk of bacterial superinfection.” These precautions are particularly

important for those with diabetes, heart disease hypertension, they wrote.

Journal reference:

- Sampson, V., Kamona, N. & Sampson, A. Could there be a link between oral hygiene and the severity of SARS-CoV-2 infections?. Br Dent J 228, 971–975 (2020). <https://doi.org/10.1038/s41415-020-1747-8>, <https://www.nature.com/articles/s41415-020-1747-8>
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