

RESEARCH INSIGHTS

'The dentist will see you now...'

Reduction of SARS-CoV-2 salivary viral load with pre-procedural mouth rinses: a randomised, controlled, clinical trial. *Br Dent J* 2023; **234**: 593–600.

The COVID-19 pandemic has had a devastating impact on society, claiming over six million lives since its first detection in December 2019.¹ Despite such adversity, health care practitioners continue to dutifully serve those in need. Given the role of the oral cavity in the pathogenicity and transmission of SARS-CoV-2 and routine exposure to aerosol generating procedures, dental care professionals are at great risk of contracting the disease. Alongside stringent handwashing and the use of level 3 personal protective equipment, the American Dental Association also advocated the use of pre-procedural mouth rinses to reduce oral SARS-CoV-2 viral load.²

Although their use is now supported by systematic reviews,^{3,4,5} the recommendations of mouth rinsing prior to routine dental procedures were largely based on laboratory findings, with little empirical evidence available at the time. These mouth rinses were shown to be effective in reducing oral viral load, but the significance of this in preventing disease transmission during dental procedures was unknown. As such, the authors of this paper set out to investigate the ability of pre-procedural rinses to suppress oral viral load over a clinically meaningful period of time.

Thirty-three eligible COVID-19 patients were recruited from the Augusta University Medical

Centre drive-through testing facility (Georgia, USA) for a prospective trial investigating the effectiveness of 0.12% chlorhexidine gluconate, Listerine (McNeil-PPC Inc., USA), 1% povidone-iodine and 1.5% hydrogen peroxide-based mouth rinses in reducing oral SARS-CoV-2 viral load compared to rinsing with water. Unstimulated whole saliva samples were collected by participants under remote supervision a few days after testing positive. Samples were collected before, immediately after, one hour and two hours after rinsing for two minutes with a randomly allocated, coded mouth rinse. Real-time reverse transcription polymerase chain reaction was then used to determine oral viral load at each timepoint via nucleocapsid and ORF1ab gene markers.

Despite past recommendations of using 1% povidone-iodine and 1.5% hydrogen peroxide pre-procedural mouth rinses, this study suggested their protective effects were short-lived at best. The abundance of the nucleocapsid gene marker for all interventions was significantly lower than the control immediately after rinsing. However, only Listerine was capable of significantly reducing both nucleocapsid and ORF1ab gene marker abundance when compared to water. The protective effect of Listerine was also sustained across the two-hour follow-up period.

The authors of this study encourage the findings to be interpreted with caution. Difficulties in participant recruitment, retention and sample collection left this study underpowered and biased towards the effectiveness of Listerine. Whilst no mouth rinses showed any significant difference in oral viral load across time points, the study highlights the need for further investigation into the ability of pre-procedural mouth rinses to prevent COVID-19 transmission.

References

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Why did you decide to undertake this study?

When the COVID-19 pandemic hit in early 2020, the world as we knew it was upended, with no long-term solutions in sight. Gradually, people realised that sheltering was not sustainable, and we would have to learn to cope with the virus, as its elimination was nearly impossible. The dental community was particularly vulnerable because our very service is in faces and mouths, from which

the virus spreads. We noted that providers were taking many precautions to protect themselves, from homemade PPE to cleansing rituals, but with little evidence to support their practices. Providers in our own community were using everything from bleach and peroxide to private concoctions as pre-procedural mouth rinses, but there was very little clinical literature on the effectiveness of mouth rinses in reducing oral viral load, virtually nothing specific to COVID-19, and sparse information on what performed best and for how long. We set out to study which of four commonly used mouth rinses performed best, if any, in reducing oral SARS-CoV-2 viral load, and for how long over clinically meaningful time points in participants with active SARS-CoV-2 infection. We encountered many hurdles given

the nature of our study, including challenges in enrolment and with safety precautions.

Did any of the results surprise you?

To our surprise, while limited in study power, we found that Listerine, an alcohol-based mouthwash with oils including thymol, worked better and longer than other rinses including diluted betadine and hydrogen peroxide.

What do you think the next steps should be considering your findings?

Our findings provide additional evidence to support the use of mouth rinses, like hand-washing, in preventing the spread of infectious agents in the dental office, and we hope to enrol more patients in a larger trial to expand our clinical evidence. ■