Evidence for the use of mouthwash as a preprocedural preventive measure against COVID-19: Should we rinse and repeat?

To the Editor: Despite the effectiveness of vaccines in limiting severe illness, hospitalization, and death due to COVID-19, the prevention of viral transmission has proven to be a much more elusive target. The coronavirus, enriched in the upper airway, appears to spread via droplet and aerosol even in the absence of symptomatic disease. Research and guidance from otolaryngology and dentistry, specialties at a particularly high risk of exposure, have recommended that in addition to the use of standard infection control measures, patients be given a preprocedural mouth rinse in the outpatient setting.[1-3] As dermatologists, we regularly work in close proximity to patients' mouths while performing biopsies on the face and mucosa or injecting lip and jawline filler. Here, we discuss the safety and efficacy of commonly used oral rinse agents in reducing SARS-CoV-2 viral load and examine the potential role of this preventive measure in routine dermatologic practice (Table I).

Povidone-iodine is a frequently used and well-studied oral rinse because of its broad-spectrum antimicrobial coverage and virucidal activity. In in vitro and in vivo studies, the use of povidone-iodine at a low concentration and for a short duration resulted in a significant reduction in COVID-19 viral load; and may be the most frequently recommended agent for use in this regard.[2,3,5] Importantly, adverse effects were rare and transient; moreover, there is a low likelihood of an allergic reaction with this agent.[5]

Chlorhexidine is considered the gold-standard antiseptic in dentistry. Although it has demonstrated activity against many enveloped viruses, its efficacy against SARS-CoV-2 is more controversial.[1,2] Overall, data supporting the use of chlorhexidine are less consistent than evidence for the use of povidone-iodine as a virucidal oral rinse.[2,5] Furthermore, adverse effects such as dental enamel and tongue staining as well as dysgeusia make it less desirable than other options.[5]

Conveniently, commercially available oral rinse solutions have also shown strong in vitro antiviral activity against SARS-CoV-2.[2,4,5] The active ingredients in these formulations include ethanol, hydrogen peroxide, cetylpyridinium chloride, and essential oils. However, there are limited in vivo studies corroborating their efficacy.[2,4,5]

The ongoing emergence of SARS-CoV-2 variants underscores the importance of engaging all lines of defense against COVID-19 transmission. Although in vitro data demonstrating the virucidal activity of these rinses are compelling, it is premature to directly extrapolate these results to the clinical setting. In vivo reports thus far are either underpowered or lack the necessary control groups to definitively show a clear benefit.[2] Nonetheless, potential harm from an oral rinse is extremely unlikely in limited-use settings such as preprocedural prophylaxis, especially with commercially available formulations. Since SARS-CoV-2 can remain aerosolized for many hours, diminishing the viral load from unmasked talking, exhalation, or coughing during dermatology appointments could improve infection control between patient visits.[3] Further research, including large-scale in vivo studies, is needed to determine whether this relatively inexpensive, low-risk, and easily implementable intervention is truly protective in a real-world clinical setting.

Jia C. Gao, BS,[a] Channing Hood, MD,[a] Bijan Safai, MD,[a] and Shoshana Marmon, MD, PhD[a,b,c]

From the Department of Dermatology, New York Medical College, Valhalla,[a] Department of Dermatology, Coney Island Hospital, Brooklyn,[b] and Department of Dermatology, Cumberland Diagnostic and Treatment Center, Brooklyn, New York.[c]

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Correspondence to: Shoshana Marmon, MD, PhD, Department of Dermatology, Coney Island Hospital, 2601 Ocean Pkwy, Brooklyn, NY 11235

E-mail: Shoshana.Marmon@nychhc.org

Conflicts of interest

None disclosed.

Table I. Summary of key data demonstrating the efficacy and safety of oral rinse agents

Oral rinse agent	Efficacy	Safety
PVP-I	In vitro: Short contact therapy (15-60 s) with 0.23%-1.5% PVP-I caused a significant reduction in SARS-CoV-2 viral load.[1,3] 5% dilution completely blocked viral infectivity.[4] In vivo: 1% PVP-I for 60 s substantially reduced SARS-CoV-2 viral load over 3 h.[3,5] 0.5% PVP-I for 30 s considerably diminished salivary SARS-CoV-2 6 h after use.[2]	There are no known adverse effects of concentrations up to 2.5%, used for up to 5 consecutive mo.[5] Contraindicated in patients with iodine allergy, thyroid disease, pregnancy, or radioactive iodine use.[5]
CHX	In vitro: 12% CHX had minimal antiviral efficacy against coronaviruses.[1] 50% dilution completely blocked viral infectivity; 5% dilution moderately suppressed viral infectivity.[4] In vivo: 0.2% CHX for 30 s showed inconsistent and variable efficacy among study subjects.[2] 0.12% CHX for 15 s led to a transient decrease in the level of SARS-CoV-2 2 h after treatment.[1,5]	Adverse effects include teeth staining, supragingival calculus formation, and gustatory changes.[5]
H_2O_2	In vitro:1.5- 3% H_2O_2 for 15-30 s failed to produce adequate antiviral activity.[3] 5% dilution of Colgate Peroxyl (1.5% H_2O_2) completely blocked viral infectivity.[4] In vivo: 1% H_2O_2 for 30 s showed no significant reduction in SARS-CoV-2 at 30 min after treatment.[5]	No known adverse effects.[4]
Listerine Antiseptic Original (20%-30% ethanol and essential oils)	In vitro: 50% dilution completely blocked viral infectivity; 5% dilution moderately suppressed viral infectivity.[4]	No known adverse effects.[4]
Colgate Plax (CPC)	In vivo: 0.075% CPC for 30 s significantly reduced SARS-CoV-2 load for up to 6 h after treatment.[2]	No known adverse effects.[2]

CHX, Chlorhexidine; *CPC*, cetylpyridinium chloride; *H_2O_2*, hydrogen peroxide; *PVP-I*, povidone-iodine; *RT-PCR*, reverse transcription polymerase chain reaction.

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