PVP-I mouth rinse in dental practice

In vitro virucidal activity of povidone iodine gargle and mouthwash against SARS-CoV-2: implications for dental practice. *Br Dent J* 2020; 229: <https://doi.org/10.1038/s41415-020-2402-0>.

additional measures currently in place to reduce transmission.⁵ This study aims to assess the *in vitro* virucidal effectiveness of Betadine oral rinse against SARS-CoV-2 at varying time intervals.

Betadine gargle and mouthwash (povidone iodine; PVP-I) was tested for virucidal activity against SARS-CoV-2 in both clean (0.3 g/l bovine serum albumin) and dirty conditions (with added 3 ml/l human erythrocyte inclusion to simulate organic soiling). This was completed at two concentrations (1% PVP-I and 0.5% PVP-I).

The virus was prepared by infecting confluent monolayers of Vero E6 cells with the virus, which were then cultured in Dulbecco's Modified Eagle Medium supplemented with 10% fetal bovine serum maintained at 37°C in a 5% CO₂ atmosphere. Following this, the virus was centrifuged and titred. Further tests were completed to assess the cytotoxic activity of the PVP-I on host cells, which was taken into account in subsequent testing.

The virus kill time assay was completed with two concentrations under different contact times (15s, 30s, 60s) in both clean and dirty conditions. Saline was used as the control. The virucidal activity was calculated as the difference in reduction in virus titre with respect to the control.

The results demonstrate a $\geq 4 \log_{10}$ reduction of SARS-CoV-2 titres, which corresponds to a $\geq 99.99\%$ kill rate at all contact times in both clean and dirty conditions. A $> 5 \log_{10}$ reduction was achieved using 1% PVP-I at all contact times and both conditions, whereas 0.5% PVP-I elicited a $> 4 \log_{10}$ reduction at 15 seconds, and $> 5 \log_{10}$ at 30 and 60 seconds.

This *in vitro* study has shown that the addition of a virucidal mouthwash to the measures already in place could reduce the risk of COVID-19 transmission within the dental setting. Caution must be applied when considering these results in clinical practice, particularly as replenished saliva has the potential for reinfection, and the substantivity of PVP-I is not known.

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Coronavirus disease (COVID-19) is caused by the virus, SARS-CoV-2. Transmission of the virus is via droplet spread through contaminated surfaces and subsequent contact with mucous membranes. Recently, it has been demonstrated that the potential for airborne spread of the virus following aerosol generating procedures (AGPs) exists.¹

Dental procedures can be considered high risk for COVID-19 transmission due to the close proximity of the clinician to the oral cavity and nasopharynx, as well as the frequent generation of both aerosol and splatter through treatment provision.¹ Current evidence suggests the saliva of infected individuals contains a viral load of up to 10^7 /ml.² As a result, the pandemic has had a significant impact on the provision of dental services internationally.³

Throughout the COVID-19 pandemic, dental treatment has been delayed or indeed reserved for emergency care only in the UK.⁴ Currently, treatment provision has not yet returned to normal; additional PPE and fallow times have decreased the number of appointments being offered, therefore having an impact on service provision and waiting lists. A number of mitigating factors have reduced the fallow time and indeed the risk of transmission, which include an increase in air ventilation and the use of rubber dam.^{5,6} Mouth rinses have also been included as

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