



The Coronavirus Disease-19 Infection and the Oral Mucosa

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Abstract

BACKGROUND: The current coronavirus disease (COVID-19) pandemics induced a modification of daily life and clinical practice. Health care workers, particularly dentists and dental hygienists, have been obliged to limit their activity and to establish new operative protocols.

AIM: We aimed to discuss an easy protocol for the prevention of cross-infections in dental settings.

METHODS: We revised literature data about COVID-19 and oral health to establish how to work safely with dental patients.

RESULTS AND CONCLUSION: A few papers are currently available about the effective prevention of COVID-19 during dental procedures. Most of the revised articles report a potential strong effectiveness of povidone-iodine and its safety for both patients and dental professionals.

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Introduction

The novel coronavirus (CoV), officially named as severe acute respiratory syndrome (SARS)-CoV-2, is a newly discovered virus, responsible for the so-called CoV infectious disease (COVID)-19, an infection originating in the upper airways. COVID-19 infection occurs mainly by air droplets and after a considerable introduction of viruses particles in closed and poorly ventilated rooms, at close contact with the presumed positive person; also by contact with contaminated objects, where COVID-19 can survive for some hours [1], [2], [3].

Then, it is spread through direct or indirect contact with the oral, the nasal cavity and the eye mucous membranes. At this level, SARS-Cov2 seems to cause chemosensory dysfunction as ageusia and anosmia [2].

The most likely cause for transient hypogeusia and hyposmia in SARS-CoV2-infected patients is a direct contact and interaction of the virus with gustatory receptors or olfactory receptor cells [3]. The oral mucosa could be

stimulated by speaking, coughing, and sneezing and viral particles have the ability to become aerosolized; they can stay in the air for 3 or more hours and may spread to contaminate multiple surfaces in the surrounding area [4]. As a consequence, the SARS-CoV-2 became able to interfere with both respiratory and oral environment, also determining temporary (and perhaps permanent) damages of central nervous system [5], [6].

Given the capability of the SARS-CoV-2 of surviving over surfaces for several hours, it is crucial to perform an appropriate disinfection of the oral mucosa before any intervention [7], [8]. Furthermore, arising evidences exist about the positive action of antiviral and anti-allergic drugs in the oral district that seems to be useful in ameliorating the inflammatory status and reducing potential infection transmission. However, at least 10 clinical trials have been started to evaluate the efficacy and potential side effects of other products, including the ones used for oral hygiene [7], [8], [9].

While studies on virucidal activity of povidone-iodine (PVP-I) have not yet been performed specifically on SARS-CoV-2, several *in vitro* studies demonstrated

its effectiveness against multiple viruses including related CoVs; for example, Eggers *et al.* examined a diluted PVP-I (0.23%) formulation against SARS-CoV-1, MERS-CoV, and influenza A (H1N1) applied for 15 s and found >99.99% reduction of viral titers [10]. Mouthwash/gargles for 1 min with a solution of PVP-I diluted 1:3 (for 7.5% PVP-I) or 1:4 (for 10% PVP-I) to achieve <3% concentration is safe and may help to reduce the viral load and the potential aerosolization of SARS-CoV-2. It could be effective to reduce viral load from asymptomatic COVID-19 patients, also providing a protective oropharyngeal hygiene measure for the health professionals. Moreover, as suggested by Sampson [11], oral hygiene should be improved during a COVID-19 infection aiming to reduce the bacterial load in the mouth and the risk of a bacterial superinfection. These easy-to-do, cost saving tips may be performed in any dental setting and effective to reduce the risk of severe infections [12], [13], [14]. Our suggestion is to maintain an extremely high level of oral hygiene to avoid any dental emergencies, therefore, patients should wash their teeth at least twice a day, floss daily, and use a PVP-I mouthwash thrice a day. This not only reduce the risk of dental emergencies but the oral viral load also and might, even if there is no evidence, reduce the risk of contaminating the surrounding environment [15], [16], [17].

By the way, based on the current literature, we can use local iodine-based products associated with systemic antiviral and anti-inflammatory drugs to avoid the infection spreading [18], [19], [20].

Conclusion

We must deepen our knowledge about SARS-CoV-2 biology and better understand the oral pathophysiology of COVID-19 to establish specific protocols to prevent its transmission and clinical consequences.

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