

Importance of using Chlorhexidine mouthwash prior to dental treatment: A literature review

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Abstract

A recent outburst of coronavirus 2 (SARS-CoV-2) first appeared in a Chinese province known as Hubei. Coronaviruses, also regarded as SARS-CoV-2, are large enveloped, single-stranded, and single-sense RNA viruses. These viruses can infect a wide variety of animals as well as humans. Dental care providers, particularly dentists, work intimately with patients and therefore have an enhanced risk of direct transmission of coronavirus 2. Several studies hypothesized that mouthrinses would reduce SARS-CoV-2 viral load in the oropharynx and its fluids, thereby lowering viral load in dental aerosol. This literature review discusses the potential use of preprocedural mouthrinses, particularly chlorhexidine, along with the COVID-19 effect on oro-maxillofacial treatments and the new threats of the coronavirus pandemic.

Keywords: Covid19; Mouthwash; Chlorhexidine; Dental treatment

1. Introduction

The recent outburst of coronavirus 2 (SARS-CoV-2), which first appeared in a Chinese province known as Hubei, has escalated to numerous other states. In 2020, a worldwide health emergency was declared by the WHO due to increasing COVID-19 notification rates in China and other states. The rate of case detection is altering daily and can also be tracked directly on the portal provided by the University of Johns Hopkins and other online platforms [1]. Coronaviruses, also called SARS-CoV-2, are giant enveloped, single-stranded, and single-sense RNA viruses; these viruses have infected a wide variety of animals and humans. The term "coronaviruses" was first narrated by David Tyrell and M.L. Bynoe in 1966, who cultured human coronaviruses from individuals with viral rhinitis [2]. They were named coronaviruses in reference to their structure as round virions along with a viral core and peplomers, or surface projections, that appeared like a stellar corona. Alpha, gamma, beta, and delta are four different variants of coronavirus. Whereas alpha and beta strains derive from the class Mammalia, especially bats, variants including delta and gamma derive from the avian and porcine classes, respectively. The apparent size of the genome extends between 26 and 32 kilobytes.

Approximately seven discrete subtypes of SARS-CoV-2 could infect humans; among them, the beta-coronaviruses can induce severe illness and even death. Alpha-coronaviruses, on the other hand, cause asymptomatic or mildly symptomatic illness. Coronavirus 2 relates to the beta-coronavirus B lineage and is intimate with the coronavirus [3, 4]. Coronavirus 2 successfully moved from the animal group to human beings on the domestic seafood market in China. Pneumonia was the primary manifestation of coronavirus 2, which aided in the detection of COVID-19 illness. Earlier studies also determined gastrointestinal manifestations and symptomless illness, specifically among children [5]. Studies until now have recommended an average incubation period of five days and a median incubation time of approximately three days [6, 7]. The ratio of people infected by coronavirus 2 who remain symptomless amid the period

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of illness has not so far been ascertained. Symptoms of coronavirus 2 usually appear after a few days in people who have manifestations, and include pyrexia, cough, stuffy nose, fatigue, and other upper airway infection manifestations. The illness can progress to an acute illness accompanied by breathlessness and critical chest manifestations similar to pneumonitis. In this study, we summarized the data available on preprocedural mouthrinses, especially chlorhexidine, along with the effect of coronavirus 2 on oro-maxillofacial surgery treatments and new possible COVID-19 threats [8].

2. Discussion

2.1. Mouthwashes in dentistry to avoid transmission of Covid19

Dental care providers, particularly dentists, work intimately with patients and therefore have an enhanced risk of direct transmission of coronavirus 2. A coronavirus 2-free environment is considered a dental care provider's responsibility, but health centers are unable to carry this out due to the easy and rapid spread of coronavirus 2, particularly during dental procedures, resulting in the closure of a large number of clinics during this pandemic; however, many dental patients in need of emergency dental care are unavoidable, so it is critical to perceive a different way to effectively treat them.

The use of preprocedural mouthwashes has been suggested to decrease the viral burden of ptyalin and oral cavity tissues, thus reducing the viral burden in the aerosol produced during dental procedures. Despite the presence of several types of mouthwash, such as chlorhexidine, mouthrinse has antiviral properties. There is finite data available regarding the clinical effectiveness of any mouthwash in decreasing the risk of SARS-CoV-2 transmission during dental procedures [9–11].

A study that included about 38 RCTs by Fang Hua et al. observed that dental cleanliness by mouthrinses can reduce the occurrence of ventilator-associated pneumonitis in severely ill patients [12]. In another study conducted by A. Wood et al., the antiviral activity of various mouthrinses, including chloroxylenol, chlorhexidine, and benzalkonium chloride, was checked against different enveloped and non-enveloped viruses with the aid of the suspension test technique. Each solution showed efficacy within a minute [13].

2.2. Chlorhexidine mouthwash

Chlorhexidine, a bisbiguanide compound, is considered a broad-spectrum antiseptic. In 1953, it was initially presented in medical practices as an antimicrobial or antiseptic cream. Chlorhexidine is a strong primary compound that is insoluble in water antiseptic. In 1953, it was initially presented in medical practices as an antimicrobial or antiseptic cream. Chlorhexidine is a strong primary compound that is insoluble in water. Chlorhexidine digluconate and other water-soluble chlorhexidine salts are frequently utilized in dentistry. It can be used in various pharmaceutical formulations, including mouthrinses, sprays, and gels. Various difficulties could arise when providing chlorhexidine in the form of toothpaste or a gel, as the main ingredient can bind to components in the formulation, decreasing its effectiveness. Despite recent significant advances in chlorhexidine formulations, mouthwashes are more efficient due to their long history of use as oral healthcare agents. These mouthwashes were previously accepted as a component of daily dental hygiene procedures and utilized with usual tooth brushing [14]. Jan A. M. Keijser et al. demonstrated that the effects of chlorhexidine compound on microbe biofilms are highly dose-dependent [15].

In a study, Yoon et al. showed suppression of coronavirus 2 for approximately 2 hours just after utilizing CHX mouthrinse once, recommending that the use of CHX could effectively control coronavirus 2 transmission [16]. Another study by Denis Damio Costa et al. reported that chlorhexidine gluconate (0.12%) is highly efficacious in decreasing salivary coronavirus 2 burden for approximately 60 min [17]. The prescription of CHX mouthwash prior to dental procedures or treatment is considered a routine procedure that helps to reduce the number of oral microbes in the human aerosols produced during various dental procedures. R. W. K. Li et al., *Br Dent J.*, highly recommended the use of CHX mouthwashes prior to dental procedures because of CHX's capability to reduce the coronavirus 2 burden [18].

2.3. Covid19 affected dental and oral and maxillofacial surgery treatments.

In 2019, coronavirus 2 was first identified. COVID-19 and its associated infections are increasing the load on the health system. The most frequent manifestations of coronavirus 2 are pyrexia, cough, headache, dyspnea, and fatigue. Many non-pharmacological interventions and vaccines help prevent the occurrence of coronavirus 2 [19–22].

Utilization of handpieces along with different ultrasonic tools during oro-dental procedures results in the production of salivary droplets and blood. Consequently, these droplets can lead to the contamination of dental tools and the surrounding environment. Hence, dental care providers and patients are at heightened risk of getting the COVID-19

infection. Various studies have observed that dental setups could be a significant source of virus transmission. These viruses could infect both patients and dental care providers during dental treatment. In dental clinics, there is a heightened risk of attaining COVID-19 infection due to the production of micro-droplets by infected individuals and the close contact of dental care providers and their tools with the dental patients [23].

The coronavirus 2 pandemic has agitated oro-maxillary dental practices worldwide. Kuldeep Vishwakarma et al. surveyed India. He observed that coronavirus 2 has adversely impacted the clinical practices and usual routine of several oral and maxillofacial surgeons [24-27]. H. Tanaka et al. investigated the association of oro-maxillary practices with COVID-19 transmission. The study showed that coronavirus 2 clusters could be prevented in dental settings with the help of various protective measures [27].

2.4. New threats of COVID-19

The appearance of new variants of coronavirus is a major threat. The public health administration should keep an eye on this matter. Furthermore, comprehensive research and many studies are required to cope with new coronavirus variants. Mandatory regulations, including the travel ban, isolation, good hygiene practices, and hand washing, should not be abandoned. Coronavirus 2 testing and contact tracing are crucial for new variant characterization. Healthcare organizations, including WHO, should monitor the mutations of coronaviruses. Furthermore, vaccines are considered an effective way to prevent the epidemic from spreading, but counterfeit vaccination cards can enhance the spread of coronavirus, which can further lead to more pandemic waves [28, 29, 30].

3. Conclusion

Various dental procedures may lead to the spread of COVID-19 in dental setups or clinics. As a result, oro-maxillary surgical treatment in dental settings was negatively impacted. Pieces of evidence are present that preprocedural mouthwashes, especially chlorhexidine, can remarkably decrease the microorganism count in the dental setup. Public health organizations should monitor new COVID variants as well as all threats that could result in new COVID pandemics.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest.

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