

COVID 19 and Dental Practice: A Comprehensive Review

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ABSTRACT

The emergence of the highly infectious novel coronavirus SARS-CoV-2 has led to a global COVID-19 pandemic. Since the outbreak of COVID-19, worldwide healthcare systems have been severely challenged. The rapid and explosive surge of positive cases has significantly increased the demand for medical care. Though dentists and physicians have different scopes of practice, their trainings share many similarities. Hence, dental professionals, with their knowledge of basic human science and sterile surgical techniques, are an invaluable resource in the COVID-19 pandemic response. In the present review, we aim to highlight some of the important aspects of COVID 19 and dental practice.

Key words: COVID 19, Dental practice

Introduction

Several epidemics (such as H1N1, H5N1, avian influenza, Ebola, SARS, Zika, and Nipah) have affected India and other countries in the past, which were successfully tackled with appropriate research.¹ The emergence of novel human pathogens and re-emergence of several diseases are of particular concern.² A novel human coronavirus initially referred to as the Wuhan coronavirus (CoV), currently designated as severe acute respiratory syndrome (SARS)-CoV-2, is responsible for the latest pandemic that is affecting human health and economy across the world.³ On 30 January 2020, the WHO declared the Chinese outbreak of COVID-19 to be a Public Health Emergency of International Concern because of its rampant spread, thus posing a high risk to countries with vulnerable health systems. According to the WHO situation report (14 May 2020) update on COVID-19, there have been more than 42,48,389 reported cases and 2,94,046 deaths worldwide. By imposing a nationwide lockdown, India has curtailed the spread of this virus to a certain extent; however, the total

number of reported cases has crossed 78000 with approximately 2500 deaths and these numbers continue to rise.⁴

Dental team

Dental teams, led by the dentist, are very familiar with universal personal protective equipment and other cross infection control measures and risk assessment. While these issues have become prominent during the pandemic, there has been uncertainty regarding the most appropriate Personal Protective Equipment (PPE) and way of working. Each country of the world has been required to develop policies to counter COVID-19 rapidly and has interpreted medical and scientific evidence and advice from the WHO in very different ways. Similarly, the guidelines written for COVID-19 and advice published for the safe and effective practice of dentistry have shown much variation around the world and also within countries. Perhaps this is due to the lack of evidence-based research on the efficiency of the proposed guidelines. It is well known that developing an effective vaccine that implements widespread immunization takes time; therefore, it is critical to find new practical methods in our daily dental practice so that we can offer much-needed care for patients with oral health issues. The long term consequences of this pandemic are currently unknown, but they will undoubtedly result in a 'new normal' for the provision of dental care. Many suggestions and protocols have been issued for the re-opening of or reorientation of dental clinics over a short period. However, many of the protocols have been produced posthaste (for understandable reasons) with a focus on the ideal rather than a realistic point of view.⁵⁻⁷

Possible risk of transmission of COVID-19 in dentistry

While it may be difficult to identify the particular mechanism of infection for individual patients, we are aware of the common routes of transmission. Droplet transmission and transmission through fomites (objects or materials which are likely to carry infection) are the main modes of transmission by the respiratory system in intrapersonal contact and especially during sneezing, dry coughing, or even talking. Eye exposure has also been reported as a route of transmission for the virus, with infectivity even higher than that of SARS. We also know that COVID-19 is present in saliva, but transmission through this route has not been conclusively confirmed. Considering the main path of transmission of the COVID-19 disease, dental procedures that lead to the spray of saliva particles into the air (which means almost all dental procedures) could heighten the possibility of contamination. Much effort has been made in the literature to define droplets and aerosols and to distinguish between their ability to carry the COVID-19 virus. Knowing which dental procedures produce aerosols that could carry the virus is important to help define the level of risk that these procedures create. This then helps to define what Personal protective equipment (PPE) is appropriate. As a result, both kinds of particles, or better to say, anything that comes out of the patient should be considered hazardous. Given the fact that the majority of dental instruments are made from metal and polymers, the COVID-19 could adhere and persist on these surfaces for several days. Consequently, they could present a risk of virus transmission if they are not adequately decontaminated. Fundamentally, COVID-19 in dentistry may be transmitted through air, droplets, and contact. Not only could the professionals act as transmitters, but also, they could become infected during human-to-human transmission, through non-invasive salivary secretions like a patient's cough or sneeze, or treatment procedures, such as using a high-speed handpiece or ultrasonic instruments which release aerosols which may contain saliva or blood bacteria and viruses into the environment. Therefore, using appropriate protective wearing is critical, given the fact that the spreading of saliva and dental fluids has the

potential of virus transmission because of the close distance between patients and professionals.⁸⁻¹¹

Importance of Disinfectants in the Sterilization of the Dental Office

Various disinfectants available on the market, can effectively inactivate the SARS-CoV-2. The Italian Dentists Association recommends covering all surfaces, where possible, with polyethylene wrap. The results obtained demonstrate compliance and homogeneity between the authors. Rabenau et al. and Kampf et al illustrated that various groups of disinfectants, such as propanol, sodium hypochlorite, and ethanol, in percentages ranging from 80 to 95% (as a hand rub) or 62 to 71% (as a surface disinfectant), can reduce SARS-CoV-2 load to below recording levels in a variable lapse of time. Pertinent papers on this topic are limited. The WHO guidelines recommend the use of 5% sodium hypochlorite, with a 1:100 dilution, to be applied on surfaces for an average action time of 10 min; constant ventilation of the dental surgery room is also recommended. Studies have shown that other biocidal agents such as 0.05–0.2% benzalkonium chloride or 0.02% chlorhexidinedigluconate probably have lower efficiency. The Spanish Dentists Council suggests the use of 1% sodium hypochlorite for the disinfection of the impressions. The action time of the disinfectant varies depending on the material used: 10 min for alginate, and 15–20 min for elastomers.¹²⁻¹⁵

Post-Treatment

Doffing of PPE: an appropriate doffing sequence and disposal in designated bags should be followed as per local biomedical waste protocols

- Glasses and face-shields must be washed and disinfected after each procedure.
- ABHR must be used after each patient.
- Follow-up: all patients must be followed up after 7 days for any flu-like symptoms.
- Employee care: daily log for employees' temperature and symptoms must be made and reviewed periodically. An in/out daily log book needs to be maintained as to who all entered and left the office along with the date and time.
- Post-procedure disinfection and decontamination: all sterilizable instruments should be cleaned, disinfected, and sterilized expediently, while all disposables, whether used or not, should be presumed to be infected and discarded appropriately. Concentrations between 62% and 71% of ethanol, 0.1 and 0.5% sodium hypochlorite, and 2% glutaraldehyde decreased coronavirus infectivity. An analogous effect is expected against the SARS-CoV-2. Hydrogen peroxide vaporizer can be utilized for operatory decontamination.
- Patients previously suffering from COVID-19 who have completed home isolation clearance can receive emergency dental care after fulfilling the latest CDC guidelines.¹⁶⁻²⁰

Patients with Suspected or Confirmed COVID-19

If a patient with doubtful or confirmed COVID-19 present for dental treatment, the dental procedure should be deferred. The patient should be provided with a mask to cover the nose and mouth and advise them to contact a medical provider. Refer the patient to a medical facility, if acutely sick. However, if the emergency dental care is unavoidable, it is recommended that airborne precautions should be taken, which include an airborne infection isolation room with negative pressure relative to the surrounding area and a N95 filtering disposable respirator for persons entering the room. Dental treatment should be provided in a hospital or other facility with the available precautions.¹⁸⁻²⁰

Conclusion

It is evident that COVID-19 has a negative impact on oral health as well as a significant transmission risk to dental personnel and patients. Following the recommendations of

regulatory authorities would significantly reduce the risk of transmission. Maintaining the necessary operation during the expansive phase of the outbreak depends on the availability of human resources, whose retaining has been much more threatened by their ability to coping with the situation mentally, than by the infection itself. Mental health support services, therefore, are crucial to be accessible for staff members along with the physical protection against contracting the disease.

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