



Oral healthcare in the face of new and emerging infectious diseases

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ABSTRACT

Dentists and other oral health professionals may be at higher-than-average risk for COVID-19 due to procedures during treatment that generate aerosols, through which the virus could be transmitted via saliva and blood, should the patient be infected. The American Dental Association has published recommendations and guidance, but additional research and new protocols are needed. New research should focus on tele-dentistry, which has emerged as an alternative to in-person care, in order to limit the spread of infection. Resources need to be allocated for research and development to improve access to care through this medium.

Keywords: Dentistry, COVID-19, aerosolized particles

INTRODUCTION

By the end of December 2020, more than 80 million people worldwide had been affected by COVID-19, the pandemic disease caused by the SARS-Cov2 virus, and more than 1,750,000 deaths had been recorded.¹ Early on in the pandemic, it was reported that dentists and other oral health professionals who work in dental settings may be at higher risk of contracting COVID-19, due to the frequent use of high- and low-speed instruments that generate aerosols. This may enable transmission through aerosolized saliva and blood particles, and suggests that oral health providers and their patients are likely to be at risk if appropriate precautions are not taken, particularly to protect dentists from infected patients, who may be asymptomatic.²

AEROSOL-GENERATING PROCEDURES

The size of the particles generated by dental procedures, and which may carry SARS-Cov2, is important. Both larger droplets and smaller, aerosolized particles are generated during treatment. Particles between 10 µm and 100µm in size tend to deposit in the upper respiratory tract, while particles smaller than 10µm in size can penetrate deep into the lungs.³ SARS-Cov2 has been identified in saliva and studies have theorized how such contamination might occur.⁴ Oral symptoms, such as dry mouth and

amblygeusia (diminution or loss of taste), have been recorded in many COVID-19 patients, showing a link between the disease and the production of saliva.⁵ In response to the COVID-19 pandemic, the American Dental Association first published emergency guidelines for dental settings in mid-March 2020⁶. In the initial stages of the pandemic, they recommended that dentists should treat patients only for emergencies that were potentially life threatening. This included issues such as uncontrolled tissue bleeding, trauma involving facial bones that could potentially compromise the patient's airway, deep pulpal pain due to bacterial infections and abscesses, and tooth fractures. In April 2020, the Centers for Medicare and Medicaid Services recommended postponing all nonessential dental examinations and procedures until further notice.⁷ These guidelines have been revised constantly since, as the COVID-19 pandemic has continued to spread.

BALANCING RISK WITH THE NEED FOR TREATMENT

Since March 2020, many patients have been deferring dental treatments due to fear of contracting COVID-19. This risks leading to a backlog of patients who would be better treated sooner rather than later to prevent complications. In response⁸ to the World Health Organization's

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recommendation that the public should avoid routine dental work amid the coronavirus pandemic, the American Dental Association has updated its initial recommendations on limiting procedures to only emergencies, and has responded that “oral health is integral to overall health and dentistry is essential healthcare”. It has provided updated guidelines to dentists to help them navigate decision making on patient triage, to evaluate the patient for COVID-19 infection, and to minimize risks for patients and staff during dental treatment.⁹ The risk to oral health professionals and their patients is low if guidelines are followed, but there is nonetheless a sense of stress and anxiety in both patients and providers. In the face of changing and sometimes conflicting guidelines, there is a danger that a potential build-up of patients with procedures that can no longer be postponed could create a bottleneck. A second concern is the potential loss of income for dentists and healthcare workers. Umbrella guidelines exist for dental procedures and infection control in the United States¹⁰ but the ultimate decision to seek and provide treatment has been left to dentists and their patients. The U.S. Centers for Disease Control has published guidelines for infection control protocols in dental settings during the COVID-19 pandemic. The guidelines were most recently updated on Dec 4, 2020¹¹ and advise dentists to provide necessary services while minimizing risk to patients and dental healthcare personnel. The guidelines include recommendations based on the most recently updated knowledge of personal protective equipment (PPE) and infection control in dental settings.

EXPERIENCE FROM PREVIOUS OUTBREAKS

During previous serious infectious disease outbreaks such as MERS, Ebola¹² and SARS CoV1^{13,14} it emerged that the dental professional was at higher risk of infection due to aerosolizing procedures and contact with blood and saliva. Despite these past infectious disease outbreaks, there have been limited new innovations to mitigate the spread of similar infectious diseases in dental settings. New and innovative infection control protocols need to be explored and alternative procedures developed that will minimize exposure to the virus in such settings. In

resource poor settings in African countries, for example, the challenges to accessing oral care during the COVID-19 pandemic are compounded by systematic problems present in this region, including intermittent water and electricity supply, challenging transportation systems and limited communications networks¹⁵. These barriers need to be addressed in order to provide regionally specific guidelines and recommendations to oral health providers in resource-poor settings globally. Additionally, PPE depends on availability, accessibility, distribution and affordability and in many African countries, all of these are in short supply^{16,17,18}.

The development and distribution of COVID-19 emergency use vaccines to reduce the spread of the pandemic is encouraging and will impact future access to oral health care. Additional research on the long-term impact of the vaccines and their effect on immunity will drive the future management of COVID-19 in dental settings. Equitable distribution of effective vaccines has to be ensured to improve the oral health of patients globally.

DIRECTIONS FOR NEW RESEARCH

New research should focus on tele-dentistry, which has emerged as an alternative mode of consultation, to limit the spread of infection. Resources need to be allocated to research and development to improve access to care through this medium. Dental health professionals can take on key roles during public health emergencies and help with disseminating the most recent information on the virus, to raise awareness amongst their patient population and educate them on protective measures that can be taken despite the uncertainties surrounding the disease and its causative agent. Dental surgeries can serve as centres for inoculating patients in resource-strapped settings. Using this approach, the dental health professional can contribute to improving patient education, potentially helping with rapid testing efforts, once approved virus detection kits are recommended by the FDA for dental settings. Dentists can thus get involved with national dental practice-based research¹⁴ through existing communities of practice,¹⁹ and actively contribute to improving access and maintaining patient care.

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