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Risks of COVID- 19 Transmissions during Dental Diagnostics and Procedures

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Commentary

The SARS-CoV-1, MERS-CoV and, latest notably, the new SARS-CoV-2 (COVID-19) have all emerged in the past 2 decades causing serious human illnesses and death. SARS-CoV-1 transmitted to 32 countries throughout Nov 2002 to Aug 2003, with a fatality rate of 10.87 percent. MERS-CoV infected 2,496 people in 27 countries during April to December 2012, resulting in 868 fatalities. As of June 2020, the COVID-19 infection had spread even faster, resulting in a worldwide pandemic with millions of people affected and many deaths.

A lot of research is being done to develop tests that will let doctors to diagnose and quarantine patients with COVID-19, even if they show no symptoms, in order to stop the infection from spreading. RT-PCR identification of SARS-CoV-2 is indeed the best format for COVID-19 identification so far. Self-collection kit such as a flocked tapered swab is effective substitute for sample collection. Nevertheless, multiple investigations have found that such specimens have a low specificity for identifying SARS-CoV-2. Close contact at the collection time also raises the risk of infection for doctors.

The common generally established mechanism of COVID-19 spreading is close communication with airborne droplets or aerosol. In ordinary dental procedures, rotational or surgical devices such as hand pieces, ultrasonic scalers, or air–water syringes produce conspicuous spatter and mucus and blood droplets. The distance travelled by droplets is inversely proportional to their sizes, with larger droplets settling more quickly. Very tiny droplets may evaporate, forming droplet nuclei or aerosol, and contributing to infection spread through the air. The amount and size of saliva droplets produced vary not only by dental treatment but also by individual, implying a diverse transmission potential. After ultrasonic cleaning, salivary droplets were found on clinical gowns and the inside surfaces of masks used by dentists. Although surgical masks protect the mucous membranes of the mouth and nose from splatter, they do not protect against airborne pathogens completely.

Airborne transmission is determined by the pathogenic agent's resilience in aerosols and the sensitivity of the person in the aerosol's route. The endurance of airborne SARS-CoV-1 as measured by RT-PCR and in live cultures implies that coronaviruses are transmitted via short- and long-range aerosols. The stability of COVID-19 virus in saliva droplets or aerosols is unknown at this time. The SARS-CoV-2 genome was detected not only in air samples from COVID-19 patients' rooms, but also in 66.7 percent of air samples taken from corridors outside the patients' rooms, according to a research from the University of Nebraska Medical Centre. Van investigated the stability of COVID-19 virus and SARS-CoV-1 in aerosols using a Bayesian regression model. They discovered that, like the SARS-CoV-1 virus, the COVID-19 virus remained alive in aerosols for the whole 3-hour length of the study.

To control the COVID-19 pandemic, it's critical to develop procedures for identifying the virus that can be employed by a wide spectrum of health-care providers. Saliva is a suitable specimen for home-based collection for epidemiological research because of the less potentially infectious nature of the collection procedure, the simplicity of collection, and the convenience of frequent collection for real-time monitoring. When it comes to COVID-19, saliva has the extra benefit of increased sensitivity and the ability to identify infection at an early stage.

However, the benefits from a diagnostic standpoint must be balanced against the possible risk to dental practitioners from infected patients' saliva. Although not verified in COVID-19 patients, it is indicated that antimicrobial mouth rinses such as chlorhexidine, hydrogen peroxide, or sodium hypochlorite solutions might lower viral load in saliva droplets and minimize the risk of direct transmission based on studies of SARS-CoV-1. Because large saliva droplets can stick to inanimate surfaces, changing personal protective equipment such as clinical gowns, gloves, masks, protective eyewear, and face shields between patients, as well as decontaminating work surfaces in the clinic, can help to reduce the risk of indirect contact transmission.

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