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Review Article

COVID- 19 infection in dental practice- A review

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ABSTRACT:

COVID- 19 infection is caused by Coronavirus (2019-nCoV). The patient's COVID-19 status needs to be established and patients managed accordingly to national guidelines. The present article mentioned about dental practice in present condition with COVID- 19.

Key words: Coronavirus, Dental, Severe acute respiratory syndrome.

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Introduction

The COVID-19 pandemic first originated in Wuhan China in December 2019. It has been identified as a public health emergency of international concern by the World Health Organization (WHO) and by the 29th April 2020, it reached 2954222 confirmed cases worldwide. It was first identified in samples of broncho-alveolar lavage fluid in patients with pneumonia on the 3rd January 2020, and found to be typical of a lineage B beta coronavirus, following which, it was termed novel Coronavirus (2019-nCoV). On the 11th February 2020, the International Committee on Taxonomy of Viruses (ICTV) announced "severe

acute respiratory syndrome coronavirus 2 (SARS-CoV-2)" as the name of the new virus as it was genetically related but different to the coronavirus responsible for the SARS outbreak of 2003. Moreover, the WHO named the disease caused by this virus as COVID-19.² It is problematic to quantify the exact size of this pandemic as it would necessary to count all cases including not only severe and symptomatic cases but also mild ones. Unfortunately, to date, there is not a global and standard response to the pandemic and each country is facing the crisis based on their own possibilities, expertise and hypotheses. Thus, there are different criteria for testing, hospitalisation and

estimating of cases making it difficult to calculate the number of people affected by epidemic. Based on the data we have so far, the estimated case fatality ratio among medically attended patients is approximately 2%, but, also in this case, a true ratio may not be known for some time.²

Risk assessment

The GDC has stated that ‘dental professionals’ will need to continue exercising their professional judgement and weigh the risks in any given situation’, an approach endorsed by the FGDP (UK). Ideally, initial risk assessment should be undertaken by phone or other remote triage before entering the dental practice (or at two-meter social distance upon entering). The patient’s COVID-19 status needs to be established and patients managed accordingly to national guidelines. Mitigating the risks of staff exposure to COVID-19 is paramount. Personalized risk assessment

for members of the dental team is also important, particularly relating to the increased risks associated with COVID-19 infection in certain groups (age, gender, ethnicity, pregnancy, co-morbidities etc). Safety applies to the team members at all times, which will involve the need to work as a team, and members must be trained for unprecedented events such as these so that they can ‘support the patient and their colleagues if there is a medical emergency’.³

The American Dental Association (ADA) has published interim guidance for the management of emergency and urgent dental care to assist dentists in making informed decisions concerning patient evaluation and treatment during the COVID-19 pandemic. In addition, many other international and local regulatory bodies have published guidelines and protocols for urgent dental treatment during the COVID-19 pandemic.⁴

List of emergent and urgent dental care adopted from ADA intern guidance (2020)⁵

Dental Emergency	Cellulitis, extra or intraoral swelling compromising airways
	Facial trauma
	Uncontrolled bleeding
	Dental pain due to pulpal inflammation
	Pericoronitis
	Dry socket
	Localized dental abscess (periapical or periodontal)
	Tooth fracture causing pain
Urgent Dental Needs	Dental trauma, avulsion or luxation
	Suture removal
	Denture repair due to injury to soft tissue or prior to medical care
	Soft tissue injury from orthodontic wire/ appliance
	Dental treatment prior to medical care <i>e.g.</i> radiation therapy
	Biopsy of abnormal tissue
	Replacement of lost temporary filling or cementation of permanent bridges if the temporary prosthesis is broken

Risk of transmission in dental offices

In dental practices, COVID-19 transmission is expected *via* droplets and aerosols generated during clinical procedures especially when using drills or ultrasonic devices that cause aerosol release. Based on previous reports on COVID-19 patients undergoing endotracheal intubation, aerosol transmission in an environment exposed to high concentrations of aerosols for a long time led to the spread of SARS-CoV-2. Furthermore, splatters created during oral surgery procedures, like aerosols, are also contaminated by respiratory pathogens. Another important potential mode of transmission in dental practice could be contact with contaminated environmental surfaces.⁶

During various dental procedures, aerosols and splatter can be produced by either patient, dental unit waterlines (DUWLs) or instruments used. For patients, microorganisms present in their mouth and respiratory tract may be transported in the generated aerosol; the amount of contamination is dependent on the amount of saliva, nasal and throat secretion, blood, dental plaque, periodontal infection, and the presence of any dental infection. The contamination of DUWL with very adherent organisms may be precipitated by the design of narrow lines, water stagnation, heating of dental chair unit and anti-retraction valve failure. Microorganisms may shed to the oral cavity during the use of DUWLs in dental procedures and can lead to the

spread of infection. Instruments that can produce dental aerosols include ultrasonic and sonic scalers, air-water syringe and air turbine hand piece used for tooth preparation.⁷

Aerosols are defined as a combination of both liquid and solid particles (of less than 50 µm in diameter) and when the liquid evaporates, solid particles form droplet nuclei of 0.5 to 10 µm composed of saliva, dried serum and microorganisms. These droplet nuclei can reach pulmonary alveoli carrying bacteria and viruses and transmitting various infectious diseases such as SARS-COV-2 and *Mycobacterium tuberculosis*, or it can remain afloat in the air for several hours. Splatters consist of a mixture of air, water and / or solid substances, which are of 50 µm to several millimeters in diameter and are visible to the naked eye. Due to the mass, splatters are able to have the kinetic energy to move in a ballistic manner and settle atop objects due to gravitational forces with limited penetration into the respiratory system.⁸

It is important to select the appropriate PPE after undertaking a risk assessment of the procedure, the staff and the patient, together with taking into account the current national COVID-19 alert level in order to best protect all concerned.³ Dental practices will need to follow national guidelines regarding what PPE should be available for managing a medical emergency, including a cardiac arrest. Whether an aerosol generating procedure (AGP) will be required to manage the emergency or not will determine what level of PPE will be required.⁹

Hand hygiene Hand hygiene precautions are also key in helping prevent the transmission of COVID-19. This is essential before and after all patient contact, removal of protective clothing and decontamination of the environment.¹⁰ 'Use soap and water to wash hands or an alcohol hand rub if hands are visibly clean.' It is highly likely that this hand hygiene advice is already being followed by most dental practices, although it is worth checking that the hand hygiene gel being used is effective against enveloped viruses, as not all hygiene gels have similar efficacy. Also, that hand-washing is performed correctly and for the recommended amount of time (a minimum of 20 seconds). In conclusion, although there is justifiably widespread concern about the spread of COVID-19, at this time most patients presenting in primary dental care settings are unlikely to have COVID19.¹¹

Simple screening procedures should be undertaken to ensure that any at-risk patients avoid the practice while in self isolation for two weeks. As no specific therapies

are available for COVID-19, early containment and prevention of further spread is critical to control and contain this new coronavirus. Many of the measures recommended cleaning and decontamination of surfaces, use of hand gels and personal protective equipment are already routinely in place in dentistry. With robust protocols and effective disinfectant products, UK dental practices are well placed to help prevent the spread of COVID-19.¹²

Prescription of pain medication or antibiotics might be needed to treat mild pain or localized infection. There has been a number of reports that nonsteroidal anti-inflammatory drugs (NSAIDs) may exacerbate symptoms in COVID-19 patients. Ibuprofen use has been found to be associated with increases in angiotensin- converting enzyme-2 (ACE2) receptor expression, which may facilitate infection with COVID-19. However, the literature does not provide any conclusive evidence against the use of NSAIDs in COVID-19 patients. The World Health Organization has published a scientific brief regarding the use of NSAIDs in COVID-19 that concluded a lack of evidence of severe adverse events as a result of NSAIDs use in COVID -19 patients. Therefore, prescribing NSAIDs in combination with acetaminophen to manage dental pain, is appropriate until further evidence emerges.¹³

Asymptomatic patients without known exposure to COVID- 19 cannot be assumed to be free of the SARS-COV-2 virus. Therefore, recommendations are given that all aerosol-generating dental procedures should be done in isolated and adequately ventilated rooms or in a negative pressure room (when available). The use of the highest PPE available, including eye protection and face shield, is essential as is the use of fitted N95 respirators or FDA approved N95 equivalent masks for both the dentist and the dental assistant. For none-aerosol generating procedures, the use of a surgical mask and a face shield is required (if N95 masks are unavailable/ in limited supply); however, there is a moderate risk of infection and professional judgment regarding patient treatment that must be exercised. The SARS-CoV-2 virus is viable in aerosol for three hours, which emphasizes the importance of following the correct sequence of wearing and removal of PPE as recommended by the CDC.¹⁴

CONCLUSION

COVID- 19 has become international concern. Dental practice in today's time has become challenging owing to high risk of virus transmission. Adhering to strict precautionary measures is helpful in prevention of disease.

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