



Review Article

An Interim Report on the Dental Practice Management: COVID-19

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ABSTRACT

There is a new public health crisis threatening the world with the emergence and spread of 2019 novel coronavirus (2019-nCoV). Due to the specialty of oral healthcare settings, the risk of cross infection is severe among patients and oral healthcare practitioners as they work in close proximity to their patients employing droplet and aerosol generating procedures. The transmission modes of SARS-coronavirus appear to be through droplet spread and close contact. Although the principle of universal precautions is widely advocated and followed throughout the dental community, it is not sufficient to help control the spread of this highly contagious disease. Management protocols must be modified to minimize public health risks. This includes the identification, isolation, management and report of possible and probable cases and contacts. Patient assessment should include questions on recent travel to infected areas and, contacts of patients, fever and symptoms of respiratory infections. Hence, there is a need for strict and efficient infection control protocols as the patient may be symptomatic as well as asymptomatic.

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Introduction

On 7th January a virus was identified as a coronavirus that had >95% homology with the bat coronavirus and >70% similarity with the SARS-CoV leading to the name of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) The disease was named COVID-19 by the World Health Organization (WHO) [1]. WHO declared COVID-19 a pandemic 11th March 2020, pointing to alarming levels of spread and its severity throughout the world.

The setting of dental clinics is such that it poses a high risk of cross infection among the dental health care personnel and patients. Thus, this article is to provide dental health care personnel and patients with credible information at a time when information is constantly being updated.

Epidemiology and Pathogenesis

The mode of transmission is via respiratory droplets and contact transmission by both symptomatic patients as well as asymptomatic patients [2]. These infected droplets can spread 1-2 meters and deposit

on surfaces. The virus can remain viable on surfaces for days in favorable atmospheric conditions but are destroyed in less than a minute by common disinfectants like sodium hypochlorite, hydrogen peroxide etc. [3]. Infection is acquired either by inhalation of these droplets or touching surfaces contaminated by them and then touching the nose, mouth and eyes. The incubation period varies from 2 to 14 days [median 5 days] [4]. All ages are susceptible.

Clinical Features

The clinical features of COVID-19 are varied, ranging from asymptomatic state to acute respiratory distress syndrome and multi organ dysfunction. The common clinical features include fever (not in all), cough, sore throat, headache, fatigue, headache, myalgia and shortness of breath. Other atypical symptoms are as follows: diarrhea, vomiting and even conjunctivitis. Thus, they are indistinguishable from other respiratory infections. In a subset of patients, by the end of the first week the disease can progress to pneumonia, respiratory failure and death [5]. The median time from onset of symptoms to dyspnea was 5 days, hospitalization 7 days and acute respiratory distress syndrome (ARDS) 8 days. The need for intensive care admission was in 25-30% of affected patients in published series. Complications witnessed

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included acute lung injury, ARDS, shock and acute kidney injury. Recovery started in the second or third week. The median duration of hospital stay in those who recovered was 10 days. Adverse outcomes and death are more common in the elderly and those with underlying comorbidities (50-75% of fatal cases). Fatality rate in hospitalized adult patients ranged from 4 to 11%. The overall case fatality rate is estimated to range between 2 and 3% [6].

Diagnosis

A suspect case is defined as one with fever, sore throat and cough who has history of travel to areas of persistent local transmission or contact with patients with similar travel history or those with confirmed COVID-19 infection. However, cases may be asymptomatic or even without fever. A confirmed case is a suspect case with a positive molecular test. Specific diagnosis is by specific molecular tests on respiratory samples (throat swab/ nasopharyngeal swab/ sputum/ endotracheal aspirates and bronchoalveolar lavage) [7]. Currently no evidence from RCTs is available for treatment of COVID-19, so the management remains mainly supportive and symptomatic.

Infection Control in Dental Set Up

Since at this time there are no approved treatments for this infection, prevention is crucial [8]. The greatest risk in COVID-19 is transmission to healthcare workers [9]. In a dental clinic the use of high-speed handpiece or ultrasonic instruments make saliva or blood aerosolize resulting in a large amount of droplets. All the procedures are done with the care provider operating in close proximity to the patient. The fact that the droplets spread within a radius of three feet emphasizes the danger. The standard protective measures in a daily clinical work are not effective to prevent the spread of COVID-19, especially when patients are in the incubation period, are unaware they are infected, or simply chose not to reveal their infection [10]. Thus, frequent cleaning and disinfecting areas frequently, including door handles, chairs and restrooms of the dental clinic is recommended. Wall mounted ultraviolet germicidal irradiation (UVGI) devices are being used in some health centers are thought to offer effective filtration against fungi, viruses and bacteria including tubercle bacilli and anthrax spores [11]. Moreover, photocatalytic oxidation (PCO) is based on the principle that irradiated titanium dioxide (TiO₂) produces reactive oxidising radicals that disinfect adsorbed aerosols by oxidising their volatile organic content [12].

Management of Dental Practice

I Evaluation of Patient

Recommendations include [10, 13]:

- i. Ask patients to arrive on time for their appointments to minimize amount of time spent in waiting room.
- ii. Remove reading materials and other objects like toys that may be touched by others and are not easily infected.
- iii. Schedule appointments as such to minimize contact with other patient so as to minimize crowding.
- iv. Screen patients for international travel, signs or symptoms of infection when updating the medical history. Patients showing signs or symptoms should be encouraged to contact a physician.
- v. Include Taking temperature readings as part of their routine assessment of patients before performing dental procedures. During the COVID-19 outbreak every staff should also undergo a temperature check [14].
- vi. Once a case is suspected, the care provider should report the case immediately to health authorities.
- vii. Some patients may be asymptomatic at the time of dental treatment. So, if informed by the physician or local authority that the patient is a confirmed case of COVID-19 contact tracing should be initiated and the dental office should be disinfected thoroughly.
- viii. Making sure the personal protective equipment they use is appropriate for the procedures being performed.
- ix. Wearing of surgical mask and eye protection with solid side shield will protect the eyes, nose and mouth during procedures that are likely to generate splashing of blood and saliva.
- x. The Centers for Disease Control and Prevention (CDC) maintain that a new facemask should be worn for each patient.
- xi. Different levels of mask according to the American Society for testing and Materials (ASTM) are there:
 - a. Level 1 masks have the least fluid resistance, bacterial filtration efficiency, particulate efficiency, and breathing resistance. These can be worn for procedures where low amounts of fluid, spray or aerosols are produced, for example, patient evaluations, orthodontic visits or operatory cleaning.
 - b. Level 2 masks moderately provides a barrier for fluid resistance, bacterial and particulate filtration efficiencies and breathing resistance. These can be used for procedures producing moderate to light amounts of fluid, spray or aerosols. Some examples of procedures are sealant placement, simple restorative or composite procedures or endodontics.
 - c. Levels 3 masks provide maximum level of fluid resistance and are designed for procedures with moderate or heavy amounts of blood, fluid spray or aerosol exposure. Some examples are complex oral surgery, crown or bridge placement, implant placement or use of ultrasonic scalers.

II Oral Examination

- i. The ergonomics of operator and chair position should be followed.
- ii. Thorough hand washing should be done frequently and after treatment, contact with patient and before or after handling protective gear.
- iii. Having patients rinse with a 1% hydrogen peroxide solution before each appointment. Preoperative mouth rinse reduces the number of microbes in the oral cavity [15].
- iv. Using a rubber dam when appropriate to decrease possible exposure to infectious agents.
- v. Autoclaving of handpieces after each patient.
- vi. During the outbreak of COVID-19, procedures that are likely to induce coughing could be avoided if possible or performed judiciously [14].

- vii. Minimize use of aerosol and intraoral periapical radiograph x-ray as these stimulate saliva secretion, coughing, gagging and even vomiting. [16].
- viii. Using high-volume evacuation for dental procedures producing an aerosol to prevent or minimize the dispersion of infectious droplet nuclei into the air by removing them at the source as they are emitted.
- ix. Disinfect surfaces after each patient visit (hospital grade disinfectant including quaternary ammonium-based, phenol-based, and alcohol-based products are effective against coronavirus [17].

III Emergency and Non-Emergency Dental Treatment [18]

During a national outbreak of COVID-19, it is advisable to stop all procedures resulting in aerosols generation. Only dental emergencies should be undertaken only after having taken all the necessary precautions. Royal college of surgeons Ontario defined “a true emergency” as oral-facial trauma, significant infection, prolonged bleeding or pain which cannot be managed by over-the-counter medications.

Examples of urgent dental care treatments, which should be treated as minimally invasively as possible, include:

- i. Severe dental pain from pulpal inflammation. In selected cases, procedures such as chemochemical caries removal or the atraumatic restorative technique (ART) maybe useful [19, 20].
- ii. Pericoronitis or third-molar pain.
- iii. Surgical postoperative osteitis or dry socket dressing changes.
- iv. Abscess or localized bacterial infection resulting in localized pain and swelling.
- v. Tooth fracture resulting in pain or causing soft tissue trauma.
- vi. Dental trauma with avulsion/luxation.
- vii. Dental treatment cementation if the temporary restoration is lost, broken or causing gingival irritation.

Other emergency dental care includes extensive caries or defective restorations causing pain; suture removal; denture adjustments on radiation/oncology patients; denture adjustments or repairs when function impeded; replacing temporary filling on endo access openings in patients experiencing pain; and snipping or adjustments of an orthodontic wire or fixed orthodontic appliances piercing or ulcerating the oral mucosa.

Nonemergency dental procedures, according to the American Dental Association, include but are not limited to:

- i. Initial or periodic oral examinations and recall visits, including routine radiographs.
- ii. Routine dental cleaning and other preventive therapies.
- iii. Orthodontic procedures other than those to address acute issues (e.g., pain, infection, trauma).
- iv. Extraction of asymptomatic teeth.
- v. Restorative dentistry including treatment of asymptomatic carious lesions.
- vi. Aesthetic dental procedures.

In case a patient with COVID-19 requires urgent dental treatment, the dentist and the physician should work together to determine the appropriate precautions on a case by case. This coordinated approach is critical to ensure that the risk of potential transmission among staff, patients and visitors is kept as low as possible. Lastly, just as recommended for SARS, it will be better to defer elective, aerosol generating dental treatments 28 days (two infection cycles) after the community outbreak of COVID-19 has subsided [21].

Conclusion

A comprehensive review of dental procedures that incorporate universal and standard precautions is beyond the scope of this paper as few articles in relation to dental practice are available on the recent COVID-19 outbreak which has been deemed a global health emergency. To maintain a safe practice environment all dental practitioners should follow additional precautionary measures so as to be able to face any such contagious disease in the future. Thus, prevention is the only weapon available now to combat the pandemic potentials of COVID-19 which demands continuous rigorous surveillance until a likely vaccine or cure is developed.

Conflicts of Interest

None.

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