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COVID 19: from pandemic dilemma to rebooting dental service

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Abstract

The outbreak and diffusion of SARS-CoV-2, responsible for the coronavirus disease (COVID-19) has caused an emergency in the health system worldwide. After a first development in Wuhan, China, the virus spread in other countries and was declared as a pandemic by the World Health Organization. This article is an attempt to highlight the coronavirus disease 2019 (COVID-19) in detail, its testing and guidelines for dental practice. It is important that dental professionals should be undertaken with the same high priority as that of medical healthcare workers in hospitals. The risk of a dental practitioner being positive for COVID-19 and potentially infecting patients attending emergency dental services should not be underestimated. Proactive and preventive measures need to be established as mainstay protocol to contain the spread of the virus.

Keywords: covid, pandemic, virus, dental, guidelines, frontline workers.

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus ^{1,2} In early 2020, after a December 2019 outbreak in China, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. SARS-CoV-2 is one of seven types of coronavirus, including the ones that cause severe diseases like Middle East respiratory syndrome (MERS) and sudden acute respiratory syndrome (SARS). A Chinese study of 103 COVID-19 cases suggests the virus that causes it has done just that. They found two strains, which they named L and S. The S type is older, but the L type was more common in early stages of the outbreak. The virus that causes COVID-19 is mainly transmitted

through droplets generated when an infected person coughs, sneezes, or exhales.

Symptoms

Patients with COVID-19 usually present with clinical symptoms of fever, dry cough, myalgia with nausea, diarrhea, reduced sense of smell (hyposmia) and abnormal taste sensation (dysguesia)³. Notably, about 70-80% of these patients have only mild symptoms that resemble flu and seasonal allergies. These asymptomatic patients can act as "carriers" and also serve as reservoir for re-emergence of infection. It is to be noted that the incubation period ranges from 0 to 24 days, therefore transmission can occur before any symptoms are apparent ^{4,5.} Radiographically, abnormal chest X-ray findings such as ground-glass opacities can be found in the chest ^{4,6.} Although mortality rate is not that high compared to SARS but patients with preexisting chronic illnesses such as cardiovascular disease or immune suppression manifests symptoms typical of pneumonia or acute respiratory distress syndrome ⁴.

Route of transmission

SARS-CoV-2 infections typically spread through respiratory droplets or by contact¹ such as coughing or sneezing by an infected person (within a radius of approximately 6 ft). Another important route of transmission is if droplets of SARS-CoV-2 land on inanimate objects located nearby an infected individual and are subsequently touched by other individuals¹.Studies have shown the presence of SARS-CoV-2 in both saliva and feces of the affected patients ^{7,8} Therefore, there is a potential for transmission of COVID-19 via aerosol, fomites, or the fecal-oral route that may contribute to nosocomial spread in the dental office setting .Thus, disinfection of objects and handwashing are essential for halting the spread of this disease. This led to the recent recommendation of social distancing to minimize community spread of the disease.

Patient Evaluation

Patients are evaluated based on travel history, symptoms, their severity, any pre-existing illness, age.

Telescreening and Triaging

Initial screening via telephone to identify patients with suspected or possible COVID-19 infection can be performed remotely at the time of scheduling appointments. The 3 most pertinent questions for initial screening should include

a) Any exposure to a person with known or suspected COVID-19 presentation,

b) Any recent travel history to an area with high incidence of COVID-19,

c) or presence of any symptoms of febrile respiratory illness such as fever.

A positive response to any of 3 questions should raise initial concern, and elective dental care should be deferred for at least 2 weeks.

Upon patient arrival in dental practice, patients should complete a detailed medical history form, COVID-19 screening questionnaire. Dental professionals should measure the patient's body temperature using a noncontact forehead thermometer or with cameras having infrared thermal sensors ⁹. Patients who present with fever (>100.4°F = 38°C) and/or respiratory disease symptoms should have elective dental care deferred for at least 2 weeks. As per the Centers for Disease Control and Prevention guidelines, it is said that individuals with suspected COVID-19 infection should be seated in a separate, well-ventilated waiting area at least 6 ft from unaffected patients seeking care¹⁰. Patients should be requested to wear a surgical mask and follow proper respiratory hygiene, such as covering the mouth and nose with a tissue before coughing and sneezing and

then discarding the tissue ¹⁰. After informing the patients to self-quarantine themselves, dentists should instruct the patients to contact their physician to rule out the possibility of COVID-19.

Recommended Measures during the COVID-19 Outbreak

For easier management and equal division of work, the hospital premises has been divided into the following workplace

Yellow: this is the triage and waiting area. The triage staff in the yellow area wear disposable surgical mask, cap and work clothes.

Orange: this constitutes the dental clinic. Here, dental staff is provided with Personal Protective Equipment (PPE), including disposable N95 masks, gloves, gowns, cap, shoe cover, and goggles or face shield. The area is disinfected once every half day.

Red: this forms the isolation clinic. The isolation clinic in the red area was set up on February 21. It is designed for patients who are suspected with COVID-19, who are recovering from COVID-19 (but <1 mo after they are discharged from hospital), or who need dental procedures producing droplets and/or aerosols ¹¹. Separate entrances for patients (red arrow) and staff (blue arrow) are provided in the area. Dental staff should wear protective clothing besides the aforementioned PPE. In addition, the entire isolation area is disinfected immediately after the treatment is over and the patient has left.

Green: this constitutes the resting area for staff only. They are recommended to enter the room by turn and to keep wearing medical masks unless they are eating or drinking.



Fig 1: flow chart for management of covid patients

Diagnosis and Treatment

The diagnosis of COVID-19 can be based on a combination of epidemiologic information (e.g., a history of travel to or residence in affected region 14 d prior to symptom onset), clinical symptoms, CT imaging findings, and laboratory tests (e.g., reverse transcriptase polymerase chain reaction [RT-PCR] tests on respiratory tract specimens) according to standards of either the WHO (2020a) or the National Health Commission of China (2020a). It should be mentioned that a single negative RT-PCR test result from suspected patients does not exclude infection. Clinically, we should be alert of patients with an epidemiologic history, COVID-19– related symptoms, and/or positive CT imaging results.

In suspected or confirmed cases of COVID-19 infections requiring urgent dental care for conditions such as tooth pain and/or swelling, pharmacologic management in the form of antibiotics and/or analgesics is an alternative. This approach may offer symptomatic relief and will provide dentists sufficient time to either refer the patient to a specialist or deliver dental care with all appropriate measures in place to prevent the spread of infection.A series of clinical trials are being carried out to investigate interventions that are potentially more effective (e.g., lopinavir, remdesivir; Del Rio and Malani 2020).

Infection Control in Dental Settings

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Dental patients who cough, sneeze, or receive dental treatment including the use of a high-speed handpiece or ultrasonic instruments make their secretions, saliva, or blood aerosolize to the surroundings. Dental apparatus could be contaminated with various pathogenic microorganisms after use or become exposed to a contaminated clinic environment. Thereafter, infections can occur through the puncture of sharp instruments or direct contact between mucous membranes and contaminated hands (Kohn et al. 2003).Due to the unique characteristics of dental procedures where a large number of droplets and aerosols could be generated, the standard protective measures in daily clinical work are not effective enough to prevent the spread of COVID-19 ¹², especially when patients are in the incubation period, are unaware they are infected, or choose to conceal their infection.

Effective Infection Control Protocols

Hand hygiene has been considered the most critical measure for reducing the risk of transmitting microorganism to patients (Larson et al. 2000). SARS-CoV-2 can persist on surfaces for a few hours or up to several days, depending on the type of surface, the temperature, or the humidity of the environment (WHO 2020c). This reinforces the need for good hand hygiene and the importance of thorough disinfection of all surfaces within the dental clinic. The use of personal protective equipment, including masks, gloves, gowns, and goggles or face shields, is recommended to protect skin and mucosa from (potentially) infected blood or secretion. As respiratory droplets are the main route of SARS-CoV-2 transmission ^{12,13}, particulate respirators (e.g., N-95 masks authenticated by the National Institute for Occupational Safety and Health or FFP2-standard masks set by the European Union) are recommended for routine dental practice 14,15

Oral Examination

Preoperative antimicrobial mouth rinse could reduce the number of microbes in the oral cavity (Kohn et al. 2003; Marui et al. 2019). Procedures that are likely to induce coughing should be avoided (if possible) or performed cautiously (WHO 2020a). Aerosol-generating procedures, such as the use of a 3-way syringe, should be minimized as much as possible...2. Intraoral x-ray examination is the most common radiographic technique in dental imaging; however, it can stimulate saliva secretion and coughing (Vandenberghe et al. 2010). Therefore, extraoral dental radiographies, such as panoramic radiography and cone beam CT, are appropriate alternatives during the outbreak of COVID-19¹⁶.

Treatment of Emergency Cases

Dental emergencies can occur and exacerbate in a short period and therefore need immediate treatment. Rubber dams and high-volume saliva ejectors can help minimize aerosol or spatter in dental procedures. Furthermore, face shields and goggles are essential with use of high- or low-speed drilling with water spray (Samaranayake et al. 1989). According to our clinic experience during the outbreak, if a carious tooth is diagnosed with symptomatic irreversible pulpitis, pulp exposure could be made with chemomechanical caries removal under rubber dam isolation and a high-volume saliva ejector after local anesthesia ¹⁵. Following which pulp devitalisation can be performed to reduce the pain. The filling material can be replaced gently without a devitalizing agent later according to the manufacturer's recommendation. After treatment, environmental cleaning and disinfection procedures were followed. Alternatively, patients could be treated in an isolated and

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well-ventilated room or negatively pressured rooms if available for suspected cases with COVID-19^{16,17}.

The treatment planning of tooth fracture, luxation, or avulsion ¹⁸ is dependent on the age, the traumatic severity of dental tissue, the development of the apex, and the duration of tooth avulsion (Andersson et al. 2012; DiAngelis et al. 2012; Malmgren et al. 2012). If the tooth needs to be extracted, absorbable suture is preferred. For patients with facial soft tissue contusion, debridement and suturing should be performed. It is recommended to rinse the wound slowly and use the saliva ejector to avoid spraying¹⁹. Life-threatening cases with oral and maxillofacial compound injuries should be admitted to the hospital immediately, and chest CT should be prescribed if available to exclude suspected infection because the RT-PCR test, besides timeconsuming, needs a laboratory with pan-coronavirus or specific SARS-CoV-2 detection capacity²⁰.

Conclusion

It's too soon to tell how long the pandemic will continue. It depends on many things, including researchers' work to learn more about the virus, their search for a treatment and a vaccine, and the public's efforts to slow the spread. More than 100 vaccine candidates are in various stages of development and testing. This process usually takes years. Researchers are speeding it up as much as they can, but it still might take 12 to 18 months to find a vaccine that works and is safe.

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