

Covid-19: An Overview of Safety Measures in Dental Clinics.

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Abstract

Coronavirus disease 2019, otherwise called COVID-19, has quickly become an overall crisis. The World Health Organization (WHO) has pronounced the global pandemic. In spite of the fact that the new COVID-19 infection is different from SARS-CoV, it utilizes a similar host receptor, specifically human angiotensin-converting enzyme 2 (ACE2). The coronavirus (COVID-19) has challenged all the health care professionals and health care systems and has evoked various velocities of response also, kinds of reaction around the globe. The job of dental experts in forestalling the transmission of COVID-19 is fundamentally significant. While all normal dental consideration has been suspended in nations encountering COVID-19 sickness during the time of pandemic, the need to organize for emergency dental procedures are required during this time. The only way the procedures can be performed are using personal protective equipment (PPE). Dental experts felt an ethical obligation to diminish routine consideration because of a paranoid fear of spreading COVID-19 among their patients, however were justifiably worried about the budgetary results. In the midst of the blast of data accessible on the web and

through internet-based life, it is hard to distinguish solid research proof and direction, however moral choices and guidelines with available data can be made.

Keywords: COVID-19, Dental Professionals, Dentistry, SARS-Cov-2.

Introduction

The definition of coronavirus includes a large scope of respiratory viruses, which can present with mild to severe manifestations and leads to respiratory failure. The name reminds the microscopic appearance of the virus, characterized by the presence of pointed structures on the surface, resembling a crown. [1]. Coronaviruses are enormous, enveloped single stranded RNA of the family coronaviridae. The beta-coronaviruses of this family includes SARS-CoV (severe acute respiratory syndrome coronavirus) which was first identified in 2002 and the MERS-CoV (Middle East respiratory syndrome coronavirus) which was reported for in 2012. [2]. Coronavirus is zoonotic in root, Chinese horseshoe bats (*Rhinolophus sinicus*) being the most likely origin and once inside the human body it can spread from human to human by methods for contact/respiratory beads.[3]

Toward the start of 2020, the novel virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) showed up, causing the coronavirus illness (COVID-19). The developing infection has brought about a worldwide pandemic declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO) Director-General on the recommendation of the International Health Regulations (2005) Emergency Committee. [4]. The case recognition rate is changing every day and can be followed in practically genuine time. As of 13th May 2020, at 4:43pm IST, the number of cases was 4,360,262 and reported deaths were 293,286 with 1,612,805 recovered patients globally.[5].

Terminology

Initially the disease was termed as NCIP [novel coronavirus-infecte pneumonia]. The virus was renamed as 2019-nCoV [2019 novel coronavirus] by WHO. [6]. Finally, WHO renamed the virus as COVID-19 [a short form for corona virus disease-2019]. The coronavirus study group [CSG] of the international committee on taxonomy of viruses renamed the virus SARS-CoV-2 [a short form for sevre acute respiratory syndrome coronavirus 2]. [7].

Route of Transmission

Respiratory diseases can be transmitted through droplets of various sizes: when the droplet particles are $>5-10\ \mu\text{m}$ in diameter they are called as respiratory droplets, and when at that point are $<5\ \mu\text{m}$ in diameter, they are referred to as bead nuclei.[8]. According to current sources and evidences, COVID-19 infection is essentially transmitted between individuals through respiratory droplets and contact routes. [3]. In an examination of 75,465 COVID-19 cases in China, airborne transmission was not reported. [9].

Droplet transmission happens when an individual is in close contact (within 1 m) with somebody who has respiratory manifestations (e.g., coughing or sneezing) and is consequently in danger of having his/her mucosae (mouth and nose) or conjunctiva (eyes) presented to conceivably infective respiratory droplets. Transmission may likewise happen through fomites in the immediate environment surrounded by the infected person.[9]. Therefore, transmission of the COVID-19 infection can happen by direct contact with contaminated individuals and indirect contact with surfaces in the immediate environment or with objects utilized on the contaminated individual (e.g., stethoscope or thermometer).

With regards to COVID-19, airborne transmission might be possible in explicit conditions and settings in which procedures or supportive treatment protocols that produce aerosols are performed; i.e., endotracheal intubation, bronchoscopy, open suctioning, manual ventilation before intubation, turning the patient to the inclined position, disengaging the patient from the ventilator, and tracheostomy.

Signs And Symptoms

COVID-19 presents with systemic and/or respiratory manifestations. Some of the people infected with SARS-CoV-2 are asymptomatic and can act as carriers. The most common symptoms are fever, cough, fatigue, sputum production, shortness of breath. The less common symptoms are Myalgia/arthritis, headaches, diarrhea, vomiting and sore throat. Few patients also showed symptoms like bilateral pneumonia, with grounded glass opacity and bilateral patchy shadows being the common patterns on computed tomograph. [10].

More than 80% of cases are mild and recover from the infection without needing any special treatments. However, 15% of cases are treated as severely ill and the remaining 5% of cases are categorized under critically ill.

In these severely ill and critically ill patients, the acute respiratory disease can lead to pneumonia, kidney failure and sometimes even death. [11].

Covid-19 and Dentistry

Dental clinics are the ones which are most vulnerable environments due to the close proximity of dentist with patients and the generation of aerosols during the treatment that can make COVID-19 airborne. Aerosols which is a mixture of water (from a dental instrument like high speed handpiece) and patient's saliva or blood. [12]. In an article published by New York Times has identified that dentists are the ones who are at the highest risk of getting infected by COVID-19 from their patients due to cross infection. [13]. SARS-CoV-2 transmission during a dental procedure can therefore happen through inhalation of aerosol or droplets from infected individuals or direct contact with the mucous membranes, oral fluids, and contaminated surfaces. [14]. Given the exposure risk for different working categories, dental professionals are the people who are facing the greatest coronavirus risk. Due to this, many health regulatory bodies globally [National Health Commission of China, American Dental Association, Consejo General of Spain, National health Service of UK, and Indian Dental Association] have advised their registered dental practitioners to perform only emergency dental procedures and to avoid all elective treatments like restorative and extractions of asymptomatic teeth, aesthetic dental procedures, orthodontic adjustments and routine radiographs. [15].

The first case of dentist being a positive for COVID-19 was reported on 23rd January 2020 at the Department of Preventive Dentistry in Wuhan University of Dental Hospital. Later, there was a report of occurrence of 8 cases of COVID-19 among 169 dental practitioners, stressing the high risk of professional contagiousness. [15].

Dental Treatment during the Global Pandemic

Quite a large number of medical staffs were reported to have acquired the disease while working with infected individuals. [16]. Patients diagnosed to have COVID-19 shouldn't get dental treatments, dental emergencies can happen, and close contact would be unavoidable. Besides, both the relatively prolonged incubation period of the sickness (the median incubation period was assessed to be 5.1 days, 95% CI 4.5-5.8 [17] or as long as 14 days for certain cases [18] before any indications could even be distinguished) and the post-infection time frame make it challenging for clinical staff to perceive the presence of COVID-19 contaminations, which could build the transmission of the infection during these lay periods. In this way, patients infected with COVID-19, without showing any symptoms, are of an extraordinary danger to dental specialists and other individuals from the dental group. Dental professionals, consequently, should make sure to have a significant level of awareness and integrity to manage the disease and have the option to control and deal with its spread.

Regardless of the community transmission of COVID-19 in China during the epidemic; demand for urgent dental treatment diminished by just 38% [19]. This shows the requirement for critical dental consideration in any event, during this pandemic will consistently be basic. In any case, as indicated by the US Government COVID-19 reaction plan published by the US Department of Health and Human Services (HHS) on 13 March 2020, this COVID-19 pandemic could last more than year and a half. [20].

Shutting dental clinics on during the pandemic can lessen the quantity of influenced people, yet will build the suffering of the people needing emergency dental consideration. It will likewise incense the burden on hospitals with emergency departments. This requires the

production of standard rules for dental consideration arrangement during the worldwide spread of the pandemic.

Patient Management and Prophylactic Measures To Limit Contagion

Various preventive measures are required for a dental setup during this pandemic. In the following sub-headings, we have reviewed some preventive measures to be adopted to limit contagion.

Patient triage: According to the included articles, triage was performed when patients entered the centers. No telephonic pretriage was depicted. Performing triage to examine current wellbeing status and the presence of risk factors for COVID-19 advancement is firmly recommended while receiving patients. [15]. Specifically, patients should be asked whether any contact with infected individuals or whether they traveled to places which are in highly epidemic areas.

In the event that a patient had a positive history of contact and additionally symptoms, no treatment should be performed, and the patient should be reported to the sterile specialists, to rapidly force quarantine or potentially hospitalization relying upon the seriousness of the circumstance. [15]. Delaying dental procedures to up to 14days after the exposure in asymptomatic patients who had contact with affected subjects or people who travelled to any danger zone, therefore proposing a self-quarantine at home. In instances of the absence of contacts as well as symptoms, dental systems can be performed, provided that the safety measures were executed for patients and the people accompanying with patients. [21].

Screening: Initial screening can be done over telephonic conversations before scheduling any emergency cases. Patient should be asked about previous travel history, contact with a known case of affected person with COVID-19, presence of any respiratory symptoms.

Patients falling in any of the above-mentioned category, he/she must be deferred with treatment until unless it's an emergency. [22].

Management without coming to the clinic: Pharmacological management of infections in the form of antibiotic and pain killers can be provided for infected patients for dental symptomatic relief until the quarantine period. After 14 days and no symptoms, patients can come for treatment.

Evaluating the patient: Patients are requested to wear a surgical mask, follow proper hand hygiene protocols while visiting the dental clinic. Patient should be given a COVID-19 questionnaire and asked to fill it in detail in order to get a detailed travel, medical and dental history. At this situation, even in the waiting room patients are asked to maintain 6 feet distance from each other. Body temperature should be checked and registered using a non-contact forehead thermometer or with cameras having an infrared thermal sensor should be measured. [23]. Patients who present with fever [$>100.4^{\circ}\text{F}=38^{\circ}\text{C}$] or any other symptoms like coughing, sneezing, respiratory difficulty, he/she must be deferred with treatment for at least 2-3 weeks. [22].

Prescription of mouth rinses prior to dental treatment: The use of antimicrobial mouth rinses prior to dental treatment focuses on the oxidative agents to contrast SARS-CoV-2. Mouth rinses containing 1% of hydrogen peroxide or 0.2% of povidone iodine betadine mouth rises or slightly acidic HOCl (hypochlorous acid) can be used to reduce the microbial load in saliva, with a potential effect on SARS-CoV-2. [23].

Hand hygiene: Hand hygiene protocols is a critical measure for reducing the transmission of COVID-19. It is very important to perform hand washing when coming into contact with patients and nondisinfected surfaces. It is

highly recommended to avoid touching the eyes, nose, mouth without washing hands. [15,23]

Personal protective equipment for Dental professionals: COVID-19 transmission can occur predominantly through airborne droplets. In this sense, the use of proper personal protective equipment, including surgical mask, gloves, and face shields are strongly recommended to protect eye, oral and nasal mucosa. Proper sequence of wearing, removing and disposal of PPE should be followed as given by CDC. [15,21,23].

Other protocols to be followed during procedures: Rubber dam should be placed whenever possible during the procedure to minimize the spread of splatter. Minimizing the usage of high-speed handpieces, three-way syringes and ultrasonic equipment. Use of basic disposable instruments can be used. Extraoral radiographs like orthopantomogram should be preferred than intraoral radiographs. When intraoral radiograph is mandatory, sensors should be double barriered to prevent cross-transmission. [22].

Cleaning of contaminated surfaces: careful disinfection of surfaces, with specific attention to door handles, chairs, desks are essential. COVID-19 virus can stay viable in aerosol and survive up to three days on inanimate surfaces at room temperature, with a higher preference of humid conditions. [15,23]. Dental clinics have to disinfect the place using 62-71% ethanol or 0.5% hydrogen peroxide or 0.1% sodium hypochlorite which are recommended for SARS and MERS due to the similarities between them and COVID-19. [24].

Discussion

Global unfold of COVID-19 has affected the world economy in every manner possible. Until this haze of pandemic takes a changeless stop every dental procedure should be done following the universal precautions and proper screening of patients with proper history. Few of

the patients are asymptomatic with COVID-19 since the incubation period can go from 0 to 24 days and most patients generally develop mild symptoms only and while few patients can be carriers of the infection as well. [25]. As health care professionals it's our duty to protect the general public and maintain high standards of care and infection control management in every manner possible even throughout such crisis. Hope that the guidelines proposed in this work can facilitate with the management of transmitting the contagion. And hopefully we can get back to our routine dental life globally. The dental professionals can use this review as a place to begin and still update themselves from varied data given by the dental councils.

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