

A Review on Covid 19, Oral Manifestations and Its Impact on Dentistry

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Abstract

Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) is a new public health disaster. This virus outbreak has been declared as a public health emergency of international concern by WHO. This article provides a brief review of the structure of this virus, transmission, clinical features and oral manifestations of covid-19 disease. The aim of this article is to endorse the effect of this pandemic situation on dentistry, patient management and protocols to provide ideal dental care.

Keywords: Covid 19, dentistry, oral manifestations, fumigation, teledentistry.

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Introduction

The 2019 novel corona virus (2019-nCoV) or the severe acute respiratory syndrome corona virus 2 first detected in Wuhan city in Hubei province in Central China. During the month of December 2019, a considerable number of patients developed pneumonia of unknown cause in Wuhan. These cases had a history of exposure to human seafood wholesale market. The disease then rapidly spread from Wuhan. Later an outbreak of the 2019-nCoV occurred, spreading rapidly to other regions of china as well as to other countries. Till December 7, 2020 a total of 65 870 030 cases were confirmed in 220 countries[1-3]. WHO has been deeply concerned by the alarming levels of spread and therefore, on 11 march 2020 made the assessment that covid 19 can be characterized as pandemic. Doctors and health care workers who are responding to this global health crisis have found themselves as unexpected targets in the fight against Covid 19. And we dental care professionals face a tremendous risk of this disease due to face to face communication and exposure to saliva. So better understanding of virus characteristics, modes of transmission, clinical and oral manifestations are helpful to form a protocol for dental treatments. This backing helps us to reduce infection exposure with better treatment.

Structure

Coronaviruses are enveloped positive sense RNA viruses ranging from 60 nm to 140 nm in diameter with spike like projections on its surface giving it a crown like appearance under the electron microscope: hence the name corona virus. The virus belongs to the Nidovirales order that consists of families, namely, Roniviridae, Arteriviridae, and Coronaviridae. At the same time, the Coronaviridae family is divided into two, which include Torovirinae and Coronavirinae. Further, the Coronavirinae subfamily is classified as into alpha-, beta-, gamma-, and delta- COVs⁵. SARS-CoV-2 belongs to Betacoronavirus together with two highly pathogenic viruses, SARS-CoV and MERS-CoV[4-6]

Mode of transmission

The source infection of original cases was related to huanan seafood wholesale market. Since there is similarity between the SARS-CoV-2 and Bat-CoV RaTG13 (a gene detected from a bat), researchers

supposed that bat is an initial host[7-11]The intermediate animal through which it crossed to humans is uncertain; pangolins and snakes are current suspects. Infection was thought to be transmitted through zoonotic agents; despite the closure of seafood market rate of infected patients increased which indicates human to human transmission. Respiratory droplets and direct contact such as shaking contaminated hands, or with contaminated surfaces are main sources of transmission. Still, whether blood transfusion and organ transplantation, as well as transplacental and perinatal routes, are possible routes for SARS-CoV-2 transmission needs to be determined [12]SARS-CoV-2 is also more likely to infect people with chronic co-morbidities such as cardio-vascular and cerebrovascular diseases and diabetes. The highest proportion of severe cases occurs in adults ≥ 60 years of age, and in those with certain underlying conditions, such as cardiovascular and cerebrovascular diseases and diabetes. Few COVID-19 cases have been reported in children less than 15 years or if infected shows mild symptoms than adults[6]

Clinical manifestations

The clinical features of COVID-19 are varied, ranging from asymptomatic state to acute respiratory distress syndrome and multi organ dysfunction. Research from the Chinese CDC observes that around 80% of coronavirus cases are mild, around 15% of patients have infected severe cases, and 5% have become critically ill. In the starting day of the symptom, the patient suffers from fever along with fatigue, muscle pain, and a dry cough. Few of them may experience nausea and diarrhoea a few days before the arousal of symptoms. Patients may suffer from breathing problem especially if they are elderly or have some pre-existing health condition. These are the symptoms of the patient that lead the patient to be admitted in the hospital. 15% of patients (according to the Chinese CDC) develop acute respiratory distress syndrome (ARDS), a condition where the fluid fills up in the lungs and this is mostly fatal. This usually happens in severe cases and at this point the patient is shifted to ICU[7,8]

Diagnosis and investigations

Diagnosis of COVID-19 is based on questionnaire and accurate tests like molecular methods, serology and viral culture. RT-PCR (Real Time Polymerase Chain Reaction) is standard for diagnosis⁹. Lower respiratory tract samples are better than upper ones because they have higher viral load. The chest X-ray usually shows bilateral infiltrates but may be normal in early disease. The Computed

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tomography is more sensitive and specific. Chest CT in patients with COVID-19 most commonly demonstrates ground-glass opacification with or without consolidative abnormalities, consistent with viral pneumonia. Chest CT abnormalities are more likely to be bilateral, have a peripheral distribution, and involve the lower lobes[14] Serological methods such as lateral flow assay and ELISA can be applied to detect past and present infection. Rapid tests that have been developed for the detection of SARS-CoV-2 IgG-IgM antibodies are based on lateral flow immune assay techniques. These tests can detect IgM and IgG antibodies simultaneously against SARS-CoV-2 virus in human blood within 15 min, which can detect patients at different infection stages

Treatment

Interferons- α nebulization, broad-spectrum antibiotics, and anti-viral drugs were used to reduce the viral load, however, only remdesivir has shown promising impact against the virus. Remdesivir only and in combination with chloroquine or interferon beta significantly blocked the SARSCoV-2 replication and patients were declared as clinically recovered In case of critically ill patients, plasma transfusions improve clinical condition and decrease mortality rates, though, further studies and controlled clinical trials are always mandated to determine its efficiency and exact role in treatment of Novel corona virus (2019-nCoV)[10-13]

Oral manifestations

In a case report by J. Amorim dos Santos et al, a 67 year old man who was covid positive had a white plaque on dorsum of tongue and multiple pin point yellowish ulcers on the tongue dorsum resembling the late stage of herpetic recurrent oral lesions[15]. True loss of taste is extremely rare, and it is usually preceded by the inability to perceive the odor of food due to olfactory dysfunction. In the study by Ameen Biadsee et al 25.8% reported an impaired sense of smell with impaired sense of taste in the absence of other symptoms. It is also important to notice the high proportion of patients with covid presented only with impaired sense of smell and taste[17-19] A case report of age 45 years who was covid positive, having an ulcer on dorsal side of tongue. Author stated that an irregular oral ulcer could be an inaugural symptom of Covid-19 which needs to be proven in larger cohorts of patients[25-27]

In other studies, patients with covid positive shows various oral manifestations like oral candidiasis, desquamative gingivitis, lip blisters[20-24]. The oral health of COVID-19 patients can be affected by the infection; but there is still doubt whether these manifestations could be a typical pattern resulting from the direct viral infection or may result from systemic deterioration, considering the possibility of opportunistic infections and also adverse reactions to treatments.

Covid 19 and dentistry

The spread of coronavirus has posed significant challenges for dentistry and medicine. Because of the infection risks associated with aerosol generated procedures, dental services across the world have been closed since late march 2020. During this period there was limited access to emergency dental care[21] Dental services are now slowly and tentatively beginning to re-open, although there is considerable variation in the guidance being issued on the safety procedures required. When dental devices work in the patient's oral cavity, a large amount of aerosol and droplets mixed with the patient's saliva or even blood will be generated. Particles of droplets and aerosols are small enough to stay air borne for an extended period. Thus, droplet and aerosol transmission of 2019-nCoV are the most important concerns in dental clinics and hospitals. And dental professional's frequent direct or indirect contact with human fluids, patient materials, and contaminated dental instruments or environmental surfaces makes a possible route to the spread of viruses. New approach such as teledentistry is very helpful in present pandemic situation[18]. Initial screening via telephone should include the questions such as any exposure to person who is covid positive, recent travel history and any symptoms like cough, fever or respiratory emergencies. This helps dentists to interact with patients

without risk of cross infection. Based on the information provided by dental council of India dental emergencies were classified, that helps dentists to decide a dental emergency[28]. These include emergency procedures (situations which increase the patient's death risk) and urgent procedures (situations which require priority care but do not increase the patient's death risk) Based on the patient condition, if person needs to visit dental clinic for treatment; protocols has to be followed to prevent spread of infection. Patients were requested to limit their accompanying persons. Patients and accompanying persons have to undergo screening tests and are advised to wear face masks. Alcohol based sanitizers should be provided at entrance /check in areas. Patients should be educated with posters or notices at waiting room regarding covid 19 and safety measures to follow[24-29] While treating a patient dental surgeon and assistant should wear personal protective equipment (PPE) disposable/reusable face shield that covers the front and sides of the face, and a N954 or higher level respirator. Use of FFP3 respirator offers a filtration rate of 99% of all particles measuring up to 0.6 μm (COVID-19 measures around 0.12 μm)[25]. Dental surgeon should wash their hands before patient examination, dental procedures, after touching the patient, after touching the surroundings and equipment without disinfection, and after touching the oral mucosa, damaged skin or wound, blood, body fluid, secretion, and excreta and this procedure is mentioned as two-before and- three-after hand hygiene[24] Dental professionals should be cautious to avoid touching their own eyes, mouth, and nose. Preprocedural mouth rinse with 0.2% povidone-iodine or 0.5-1% hydrogen peroxide mouth rinse has to be done as they reduce the load of virus in saliva[34]. We know that mouthwashes can be effective in reducing the risk of ventilator-associated pneumonia[19] Use of disposable diagnostic instruments, syringes, to prevent cross contamination is encouraged. Intra oral imaging may cause gag or cough reflex so extra oral imaging such as OPG and cone beam CT are advocated[16]. When intraoral imaging is required, sensors must be doubly covered to prevent perforation and must be correctly disinfected after use to avoid cross-contamination[31] Use of rubber dam during such procedures is recommended as it could significantly reduce airborne particles by 70% within approximately three foot diameter of the operational field[35] Four-handed dentistry with powerful spray mist suction system (300L/min) for aerosols should be implemented along with regular suction. Emergency dental care for covid 19 positive patients should be carried out in negative pressure rooms[34]

Fumigation/disinfecting dental clinics

It has been shown that HCoV remains infectious from 2 h up to 9 days at room temperature, and persists better at 50% compared with 30% relative humidity[24] Thus, keeping a clean and dry environment in the dental office would help decrease the persistence of 2019-nCoV. After treatment, fumigation has to be carried on daily basis in clinical or high contact areas and biweekly in non-clinical or low contact areas. Place the Fumigation machine at one corner of the room after filling the fumigation solution in it and switch on the machine. Leave the room for the process for 30 minutes after complete sealing[28]

Psychological impact of covid 19 on dental students and professionals

The occupational safety and health administration placed dental care professionals/students in the very high exposure risk category. Dental procedures are known/suspected potential spread of virus. So, this leads to significant psychological pressure on dentists[30-33] In study done by hakami et al there were elevated levels of depression, anxiety, and stress reported by the dental students during the COVID-19 pandemic[32]

Conclusion

During this pandemic situation, dental professionals have to take every needed step to provide optimum dental care with at most safety measures. We must be aware of these infectious hazards that challenge the current infection regimen. Many dental professionals

have taken part in frontline health services during this crisis and have developed new knowledge in the process.

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