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Review Article

Prevention of Covid-19 infection in Dental Setup: A Review

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ABSTRACT:

In last month of 2019, Wuhan Health Commission of Hubei province of the Republic of China reported a group of 27 patients with pneumonia of obscure etiology, presenting with a constellation of symptoms such as fever, non-productive cough, dyspnoea, and bilateral ground-glass opacities with patchy shadows in computed tomography of the lungs. The patients were epidemiologically traced back into Huanan Seafood Wholesale Market, trading live species of bats, pangolins, snakes, and badgers which bolstered the hypothesis that a live animal had been the intermediary of transmitting a pathogen to the patients. On 11th of February 2020, World Health Organization named the novel viral pneumonia as “Corona Virus Disease (COVID-19)” while the International Committee on Taxonomy of Viruses (ICTV) named this novel virus as “SARS-CoV-2” following phylogenetic and taxonomic analysis. In terms of the exposure risk for various working categories, dental practitioners confront the highest risk of COVID-19 infection due to constant exposure to saliva, droplets, blood, and aerosols. Therefore, inhalation of infected droplets/aerosols and direct contact with contaminated instruments or surfaces puts both dental practitioners and patients at stake. Present article provides the insight of Covid-19 infection and precautions and considerations to the practice dentistry in this pandemic.

Keywords: Covid-19, Corona Virus, Pandemic, Dentistry

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INTRODUCTION

The corona virus disease pandemic has emerged as a community health disaster and is spreading exponentially across the globe. The first case of Covid-19 was reported in Wuhan City, China, in late December 2019. On 11th of February 2020, World Health Organization named the novel viral pneumonia as “Corona Virus Disease (COVID-19)” while the International Committee on Taxonomy of Viruses (ICTV) named this novel virus as “SARS-CoV-2” subsequent phylogenetic and taxonomic analysis.¹

COVID-19 infection generally spreads through respiratory droplets or through contact. Air-borne spread occurs after the infected person coughs or

sneeze (radius approximately 6 feet).² Another possible route of spread is through infected inanimate objects. Studies suggest that the virus can be viable at room temperature for up to 3 days on inanimate surfaces.³ COVID-19 virus has been isolated from both saliva and feces of infected persons. SARS-CoV-2 can bind to human angiotensin-converting enzyme 2 (ACE-2) cells of human salivary glands. The risk of vertical transmission (mother to fetus) is still to be confirmed.^{1,4}

Fever, dry cough, sore throat, loss of taste, loss of smell (anosmia), or tiredness are the most common symptoms at onset of illness and headache,

haemoptysis, nausea, vomiting and diarrhoea are the less common symptoms.⁶ Some patient may report difficulty in breathing or shortness of breath. Pneumonia is also developed in some cases which can be seen on chest X-ray or chest CT. Novel corona virus infection primarily target lung and most common symptoms is acute respiratory distress syndrome (ARDS), effect were also seen in other vital organ such as heart (acute cardiac injury), kidney (acute kidney injury), liver (liver impairment) and death can occur in severe cases.^{7,8}

The primary route of spread of COVID-19 is via respiratory droplet, which makes it more vulnerable to dental professionals. Dental setups invariably carry the risk of COVID-19 infection due to the specificity of its procedures (aerosol production), proximity to the oropharyngeal region, and frequent exposure to saliva.

ORAL MANIFESTATION

The common symptoms that patients report to the dental office even at the pre-symptomatic stage are loss of taste (ageusia), loss of smell (anosmia), and hyposalivation. Few literature state that along with unexplained ulcers in the oral cavity, desquamative gingivitis, herpetiform ulcers on attached gingiva, blisters/irregular ulcers on the tongue's dorsal surface, enlargement of submandibular glands, and cervical lymph node enlargement. These oral manifestations may be associated with an erythematous rash on the face or viral enanthema. Dysgeusia or ageusia and anosmia are found to be common in COVID-19 patients, and the range varies from 5.6%– 88.8% of patients. These symptoms are more common in young individuals and females, and these symptoms usually get resolved in 03 weeks

DENTAL PRACTICE DURING PANDEMIC

COVID-19 pandemic has affected the economic, psychosocial, and social lives of dentist as well as dental patients, with increased levels of anxiety and distress. COVID-19 pandemic leads to the complete

RISK IN DENTAL CLINIC

Transmission of Covid-19 occurs primarily through droplet spread or contact routes. Due to these characteristics Dental staff and dental practitioners are considered to be at the highest risk of acquiring SARS-CoV-2 infection because of their prolonged face to face exposure to patients and exposure to respiratory secretions and aerosols produced during procedures like ultrasonic scaling and cavity/access preparation using a high-speed air rotor with water jet cooling systems.

closure of almost all dental practices throughout the world except for managing dental emergencies, which are potentially life-threatening due to airway obstruction, continuous tissue bleeding, trauma, facial bone fractures, and severe pain not manageable by medications alone. With the ease in lockdown, dental practices across the countries are opening up but with many changes in the way the treatment.^{9,10} These changes are specially necessary as the infection usually spreads through respiratory droplets or fomites, and a very high viral load is found in the oral and nasal cavity of the infected patients. The virus has been found in saliva in the early stages of COVID-19 patients. The dental surgeons/health care workers must be aware of this as they are at an increased risk of getting infected. Besides the very high viral load in respiratory droplets and saliva, the closed working environment and use of various instruments like high and low-speed turbines, ultrasonic scalers/piezoelectric instruments, 3-way syringes, dental intraoral X-rays, etc., also put the dental surgeons and health care workers at high risk of getting infected. Not only the saliva, various oral secretions, and blood may aerosolize because of inadvertent coughing by the patient or during the treatment procedure leading to cross-contamination. Thus, the aerosols may persist in the clinic environment for approximately 03 hrs, imposes an additional infection source. It should be kept in mind that the incubation time for COVID-19 after the exposure to SARS-CoV-2 is 14 days, with patients developing COVID-19 disease 4–5 days (range between 2 and 7 days) after being infected. This information is crucial as even the asymptomatic and symptomatic patients can act as carriers of SARS-CoV-2 and can cause transmission of infection. As per a report published by Rothe *et al.*, 2020, patients in the recovery phase also can be the potential sources of virus transmission. Till the time the report is negative, every patient must be considered infective, and proper measures are to be taken to avoid cross-infection.^{10,11,12}

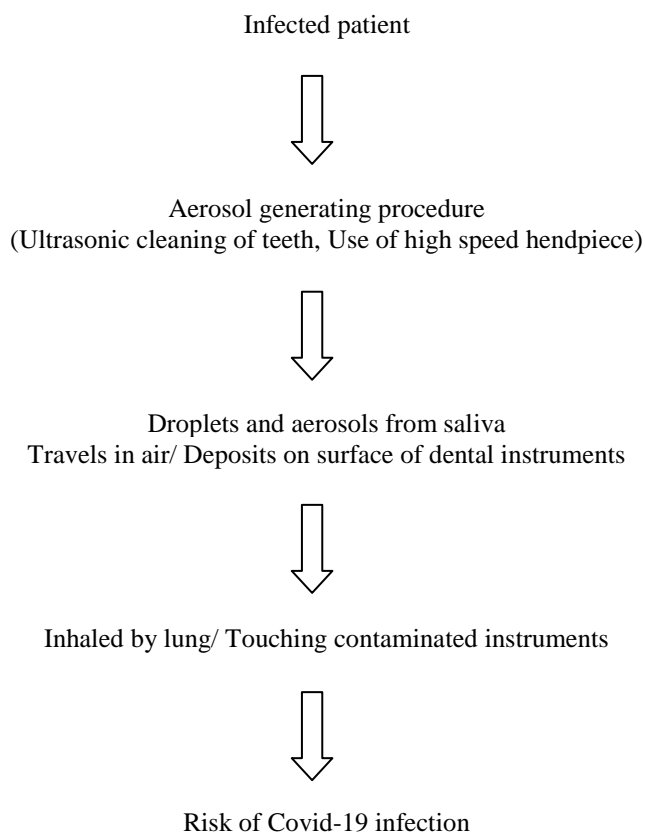


Figure no 1: Risk of Covid-19 infection

PRECAUTION TO BE TAKEN

All patients instructed to follow guidelines provided by the authorities to prevent COVID-19 infection.¹³

As soon as the patient enters the reception area, ask them to wash their hands using hand wash or alcohol-based hand rub. Use tissue paper or hand dryer to dry the hands instead of towels. Tissue paper dispenser and foot-operated waste bin are mandatory. Include temperature recordings as part of your routine patient assessment before performing any dental procedure. A noncontact forehead thermometer can be used to measure the patient's body temperature. Use of glass/plastic protective barrier at the reception desk or registration counter help in reducing the chances of infection and ensure safety of staff members. Appointments should be scheduled such that social distancing can be maintained in the waiting room. Another alternative is for the patient to wait outside or in their vehicle and they can be contacted via telephone when it is their turn to be seen. It is recommended that the patients avoid bringing companions to their appointment, except for instances where the patient requires assistance. This can be communicated to the patient at the time of scheduling an appointment.¹

For suspected or confirmed patients with COVID-19, non-emergency dental treatment should be delayed, and emergency dental treatment should be carried out in the negative pressure clinic according to the designated independent isolation route. Patients without suspected symptoms of COVID-19 and with negative test report should wear surgical masks and be placed in the waiting room with effective ventilation conditions (air exchange at least once within 3 min) and should be arranged in accordance with the principle of one person in one room to ensure that each patient is treated in a separate clinic. When patients leave the dental clinic, they are asked to wear masks again.¹⁴ The patients were asked to contact the dental clinic by the telephone number provided if they have suspected symptoms or are confirmed of COVID-19 within 14 days since their visit. The dental assistant will flush water pipeline with chlorine disinfectant, clean the surfaces of the objects with quaternary ammonium salt and disinfectant wipes, clean the floor with chlorine disinfectant, and turn on the ultraviolet light for more than an hour.¹⁵ If the patient is later confirmed to have COVID-19, the dentists and nurses who contact the patients directly will be asked to take a test for COVID-19 and further measures will be taken. To avoid the infection caused by the patient who is later confirmed of COVID-19, dental personnel need to strictly stick to the principle one person one room and disinfect the room after each treatment.

General Protection against Covid-19

| Protection level | Protection standards |
|-----------------------------|--|
| General protection | The dental personnel should strictly abide by the standard prevention principles; wear work clothes, medical latex gloves, surgical masks, work caps and goggles or face masks; strictly perform hand hygiene procedures |
| Primary protection | The dental personnel need to strictly abide by the standard prevention principle and rules and regulations on disinfection and isolation; Wear overalls, medical sterile gloves, isolation gown, surgical mask, medical cap and goggles or face mask, strictly perform hand hygiene procedures. Pay attention to the protection of respiratory system and mucosa membrane at work and dispose the personal protective equipment in an appropriate way when off duty. |
| Secondary protection | The dental personnel should follow the prevention principle strictly, abide by the rules and regulations on disinfection and isolation, perform hand hygiene procedures strictly. Clean area, potential pollution area and pollution area need to be set up and treatment should be carried out in the negative pressure isolation room. Dental personnel should wear isolation gown, medical sterilize gloves, surgical masks, medical cap and goggles or mask. The procedures should be followed strictly when wear and remove the protective equipment. Body temperature and physical signs are monitored twice a day |
| Advanced protection | The dental personnel should wear full-face respirators besides the procedures of secondary protection Body temperature and physical signs are monitored twice a day |

CONCLUSION

The outbreak of COVID-19 has affected all businesses including general dental practices, which are suffering huge financial losses as they have been advised to give only emergency dental care because dentistry is a profession where the doctor as well as the dental staff works in close range of patients mouth. A dentist should be very careful before examining a patient and should a proper medical history and travel history of the patient. The Clinic/ Operator should be sterilized every day by chemical sterilization methods. Wear eye protection in addition to their facemask to ensure the eyes, nose, and mouth are all protected from exposure to respiratory secretions during patient care encounters, including those where splashes and sprays are not anticipated. Use an N95 respirator or a respirator that offers an equivalent or higher level of protection during aerosol - generating procedures.

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