



Preventive measures for Dental Professionals during worldwide emergency COVID-19

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ABSTRACT

Coronavirus (CoV-2) is a rapidly spreading viral infection all over the world. World Health Organisation declared COVID-19 as the pandemic disease. Professionally, Dentists are prone to get the cross-infection. And are at 100% risk. This is because Dentists come across face to face communication with the patients, frequent exposure to saliva, blood, other body fluids while handling the teeth and sharp instruments. So, precautionary and preventive measures should be taken to prevent and minimize the cross-infection and spread of COVID-19. The susceptible people of COVID-19 are those who had a travel history from abroad, elderly people, immuno-compromised, and people with co-morbidities. This condition is more prevalent in males when compared to females. Transmission can be broadly divided into the direct and indirect transmission. In general, a COVID infected patient shows signs of symptoms like fever, cough, sore throat, fatigue, headache, body pain, lethargy, and breathlessness. At present, no cure or vaccine has been discovered. Currently, a combination of anti-viral and anti-malarial drugs is being used to treat patients. Simultaneously, multi-vitamins and Hydroxychloroquine is administered to most susceptible patients after consulting the physician. Prevention for aerosol, body fluids, nasal discharge is a must. Disinfection of surrounding and personal protective wear, which includes a face shield, mask, gown, head cap, double gloving, and glasses, should be worn by healthcare professionals to limit the contact to the virus. Social distancing is a must to control the transmission of this disease.

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INTRODUCTION

Coronavirus (CoV-2) is a rapidly spreading viral infection all over the world. It originated from Wuhan City(2019) and spread worldwide (Wang *et al.*, 2020a). In India to date, that is 5/4/2020, the total number of cases recorded have been 3374, 77 deaths, 266 recoveries have been reported. All over the world, total cases have been 1203188, 64747 deaths, recovery of 246760 has been reported. WHO declared COVID-19 as pandemic disease. Professionally Dentists are prone to get cross-infection. They are at 100% risk. This is because, while handling patients, Dentists come across face to face communication, frequent exposure to saliva,

blood, other body fluids, and sharp instruments. So precautionary and preventive, measures should be taken to avert and minimize the cross-infection and spread of COVID-19 (Richman *et al.*, 2016).

Morphology of Coronavirus

Corona Virus is an RNA virus. They are ranging in size from 60 nm to 140 nm in diameter with spike-like projections on the surface. Coronaviruses, namely HKU1, NL63, 229E, and OC43, are reported in humans, causing mild respiratory disease (Mailles *et al.*, 2013).

Origin and Spread of COVID-19

In December 2019, there was a marked increase in patients of pneumonia of unknown causes in China. Among these cases, many had common exposure to the seafood market and live animals. Samples of such patients and seafood were sent for lab testing to detect the cause and aetiology. On 7th January, it was found to be a viral disease caused by Coronavirus, and its source was also confirmed as seafood. Indirect transmissions of the Corona Virus occurred from infected people to healthy people. Coronavirus spread worldwide due to travelling from China to other countries or in contact with such people (Li *et al.*, 2020).

Epidemiology and Pathogenesis

Pathogenesis is more common in males (68%) than females. The more prevalent age range is 35-55 and less common in children and infants, susceptible to death in the age range of 48-89 years, more vulnerable people are those having travel history, elderly people, immune-compromised and, people with co-morbidities. The Window period of the Corona Virus is 14 days. The fatality rate is estimated to be 2-3%. The nasal cavity shows a maximal viral load. Infections spread from droplets released during coughing, sneezing by symptomatic or asymptomatic patients (Li *et al.*, 2020). Viruses present in feces, water contaminated by viruses may also spread the infection. Infection may be acquired by inhalation of this droplet or touching eyes, mouth, nose, or by contacting the surface infected by these droplets. Coronavirus can live for days in favourable condition. However, it can be killed by the use of surface disinfectants immediately, like 60% alcohol/5.25%NaOCl. To date, the trans-placental transmission has not been reported. But the infection can be acquired to neonates. Through Angiotensin receptor virus, enter respiratory mucosa (Cheng and Shan, 2020).

Transmission routes of COVID-19 in dental clinic

Transmission can be broadly divided into the direct and indirect transmission. Dentists are exposed

to various bacteria, viruses, fungi that infect the oral cavity and respiratory system. Contact with such microorganisms occurs during the dental procedure because of aerosol production containing saliva, blood that remains suspended in the air for a prolonged period. Droplets that are released during cough and sneeze may also come into contact with (oral, eye, nasal membrane), which leads to inhalation of a microorganism in the body (Singhal, 2020).

Clinical Features

Most of the common symptoms of any other viral or bacterial infections may be associated with this infection also. Therefore, it is a challenge to diagnose this disease (Huang *et al.*, 2020). An infected person may show signs and symptoms like fever (88.7%), cough (67.8%), sore throat, fatigue, headache, body pain, lethargy, and breathlessness. Conjunctivitis may be seen in some patients. Some patients may be asymptomatic (Wang *et al.*, 2020b). In patients with compromised immunity and elderly patients, diseases can advance to pneumonia, respiratory failure, and death. An increase in the count of inflammatory cytokines is seen. It is considered that patients vaccinated by the BCG vaccine are less susceptible to this infection (Jin *et al.*, 2020).

Diagnosis

An individual is said to be susceptible when one has signs, symptoms of fever, cough, sore throat, weakness, body pain, breathlessness, travel history to an area prone to this infection, or in contact with people having COVID-19 (Chen *et al.*, 2020). Such patients undergo investigation for confirmation. The examinations are like PCR, specific molecular test on throat/nasal swab, sputum, Broncho-alveolar lavage. TLC, DLC count, which may be low (Ganguly *et al.*, 1995). ESR level is elevated. Chest X-ray. CT scan gives accurate findings of investigations to check respiratory signs, showing ground-glass opacity and sub-segmental consolidation (Biswas and Kher, 2001).

Differential Diagnosis

It includes all types of respiratory viral, bacterial infection (Singhal, 2008).

Preventive measures and treatment

To date vaccine against, Coronavirus is not introduced (Deo *et al.*, 2009). Therefore, the best option for people are to prevent exposure. According to WHO guidelines, the use of face masks cover the face during coughs and sneezes with the flexed elbow or using tissues while coughing or sneezing, which are then safely disposed of (Kumar *et al.*, 2019). Washing-hands every 15- 20 minutes interval with soap or disinfectant. Avoid contact with infected

people. Maintain a distance of 3 feet. Avoid touching eyes, nose, mouth by unwashed hands. Isolation of COVID-19 patients. Avoid panic and educate the population and stop rumours about Coronavirus (Dhar *et al.*, 2019).

Measures for avoiding transmission of COVID-19 at Dental clinic

1. Paste a chart at the clinic's entrance to show that patients with symptoms of cough, sneeze, cold, and fever, difficulty in breathing from the date it occurred, or last 14 days, should consult a physician and reschedule their dental appointment.
2. Self-explanatory posters showing coughing etiquette, i.e., to cover mouth and nose while coughing and sneezing, how to hand scrub, how to dispose of a mask, tissue after use should be pasted at the main door, operation area, elevators, waiting for lobbies.
3. Reschedule the appointments of patients having a history of travel to foreign countries or in areas or cities having COVID-19 prevalence. Also, patients having a history of contact with patients having COVID-19 and patients should be immediately reported to the health department.
4. Avoid non-emergency treatment.
5. Patients should be asked to sanitize hands before entering the clinic and rinse the mouth by 10% povidone-iodine and wear masks on the mouth.
6. The dentist should wash hands before and after direct contact with the patient. This washing should be done soon after the removal of gloves and, beforehand, handling sharp and invasive devices. Washing hands should be done immediately after bare hands come into contact with blood, body fluids, saliva, and when moving from a contaminated to a clean body site.
7. Also, Plastic barrier should be applied at places that are going to come in contact with the patient. This barrier should be changed after each patient.
8. Before treatment, take detailed medical history primarily related to the respiratory system, travel history, temperature assessment, address, and contact details of the patient.
9. Personal protective wear which should include a gown, eyeglasses, face shield,

mask(N95/FFP2), head-cap, gloves should be put on before coming in contact with the patient by both doctor and assistant. This will prevent contact of aerosol to oral, nasal, eye membranes.

10. Use of rubber dam, high-pressure suction to reduce aerosol production.
11. Operatory area should be disinfected using a surface disinfectant like 5.25% NaOCl, 2% savlon after each patient
12. Complete set of instruments, hand-piece should be autoclaved after each patient. There is no approved treatment for COVID-19 to date as prophylactic dose Chloroquine drug is given to the susceptible patient. Complete isolation of the infected patient is a must. Supportive and symptomatic treatment is initiated. The basic principle is to control fever, cold and proper nutrition, and hydration. The use of antibiotics and oseltamivir anti-viral drug should be prohibited. Inpatient with hypoxia, supplemental air supply through a face mask, nasal cannula, non-invasive and mechanical ventilation should be provided. Anti-viral medications such as ribavirin, lopinavir, ritonavir have been used based on the experience with SARS.

CONCLUSIONS

Prevention is better than cure is the only way to win over the Coronavirus until a vaccine is introduced. Coronavirus outbreak has challenged the economic, medical, and public health infrastructure. It is spreading across the world at an alarming rate. Elderly and immune-compromised are most susceptible. Few treatment guidelines have shown effective results. Still, a complete cure is not available, and no vaccine has been introduced. With proper preventive measures, the virus can be contained, and humans may be protected.

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Conflict of Interest

The authors have no conflict of interest

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