



Review Article

Coronavirus disease 2019: A new challenge for dental professionals

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ABSTRACT

Infection control is one of the most important elements in dentistry. During the past 6 months, a novel disease namely coronavirus disease 2019 has emerged as a rapidly spreading viral disease all over the globe. Various guidelines have been laid down and measures have been taken by the health professionals, government organizations, and apex like World Health Organization to combat its massive spread. However, dental professionals and health care workers are exposed to patients suffering from these contagious diseases. This article briefly discusses the literature on Coronaviridae, addresses the real risk of cross-transmission of coronavirus among dentists and guidelines by the author on preventive measures and role of dentists in prevention of coronavirus infection.

Keywords: Coronavirus disease 2019 virus, Dental professionals, Cross-infection, Prevention, Control

INTRODUCTION

History of coronavirus

With a decline in the incidence in China, but the number of infected individuals has increased several folds in other countries such as South Korea, Italy, Iran, and India. India is reporting at 3.31 million cases, out of which 2.52 million recovered cases and around 60,472 deaths are reported as on 28 August 2020.^[1] The name coronavirus is derived from the word crown as there are crown-like surface projections on the surface of this virus when seen under electron microscopy.^[2] The novel coronavirus infection has emerged as a new pandemic disease resulting in severe acute respiratory syndrome (SARS) type of illness.^[3,4] The transmission of coronavirus from animals to humans resulted in Southern China due to lack of biosecurity measures in animal cultivation and intake, exotic food habits, and poor controls and norms of wet markets.^[5,6] Cases of crossover infection of coronaviruses from animals to humans have occurred in the past resulting in severe illness and mortality. SARS coronavirus had the mortality rate of 11% and MERS-CoV had the fatality rate of 34%.^[7-9] Because of alarming levels of spread and severity, and by the alarming levels of inaction, the Director-General of the WHO characterized this coronavirus disease as a pandemic, on March 11, 2020.^[10] Complete information about how the virus is spreading is still unknown and the current knowledge is currently based on similar coronaviruses.

MODE OF TRANSMISSION OF CORONAVIRUS

Epidemiological records in China suggest that up to 85% of human-to-human transmission has occurred in family clusters and thousands of health care workers have become infected,

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with an absence of major nosocomial outbreaks.^[11,12] Cases of coronavirus disease 2019 (COVID-19) infection are increasing exponentially since the outbreak with an epidemic doubling time of 1.8 days.^[13] Reports suggest that infection is transmitted through large droplets when symptomatic patients cough or sneeze and this can occur before onset of symptoms also. Infected droplets can spread about 1–2 m and deposit on surfaces. Infection is acquired by either inhalation of infected droplets or contact of contaminated surfaces with nose, mouth, or eyes.^[14] It is also hypothesized that the virus may be present in stool and contaminated water supply, so aerosolization and fecal–oral route of transmission are also a possibility.^[15] Transplacental transmission is not found yet, however, neonatal transmission resulting in neonatal disease has been reported.^[16] The incubation period of virus varies from 2 to 14 days with a mean of 5 days. The virus enters the respiratory tract through angiotensin receptor 2.^[17] Caretakers of old age homes are at higher risk of acquiring this illness as evident from a series of death reports in the US.^[18] Hence, a person-to-person transmission has become the primary mode of transmission of this virus which has occurred in health-care facilities, workplaces, homes, as well as public transportation. The most important route being direct or indirect mucosal contact with droplets or fomites infected with COVID-19.^[19]

There is high possibility of transmission of bacterial and viral infections in dental practice. Saliva and blood are major sources of cross contamination during dental treatment. There are many aerosol-generating procedures in dentistry such as in cavity preparation, ultrasonic scaling, and tooth preparation so droplet contact should be avoided and air borne precautions should also be considered.^[19] Coronavirus is physically stable in the environment, so protective measures by the public are necessary to break the chain of infection. Early recognition of the disease along with isolation of suspected cases is the primary measure to prevent nosocomial spread.^[20]

CLINICAL PRESENTATION

Recently, the WHO reported that the time between onset of symptoms and death may range from about 2 to 8 weeks.^[21] Recognition of signs and symptoms of any infection is very crucial for steps to be taken to reduce cross transmission in health practice. Reported illnesses from coronavirus disease vary from mild cough and fever to shortness of breath and even deaths. Early symptoms of the disease are fever, cough, and shortness of breath. Emergency warning signs such as difficulty in breathing, persistent pressure or pain in chest, confusion or inability to arouse, and bluish lips or face need urgent medical attention.^[22] Coronavirus is physically stable in the environment, so protective measures by the public are necessary to break the chain of infection. Early recognition

of the disease along with isolation of suspected cases is the primary measure to prevent nosocomial spread. For the first 3 months of COVID-19 pandemic, COVID-19 was expected to be an immunizing non-relapsing disease. Nevertheless, rare cases of suspected COVID-19 recurrence or reactivation have been reported.^[23]

CRITERIA FOR TESTING

Sample collection for testing is done with nasopharyngeal and oropharyngeal swabs and aspirates. Respiratory precaution has to be taken for sample collection and preservation in transport media.^[23] The diagnostic tests for this virus are based on nucleic acid amplification assays, antigen detection assays, and antibody detection assays. According to the current testing strategy by Indian Council of Medical Research, health care workers managing respiratory distress/SARS illness should be tested when they are symptomatic. Testing is being done at CSIR, DBT, DRDO, govt. medical colleges, etc., free of cost.^[24]

INFECTION CONTROL MEASURES

Since the virus is enveloped, physically intact, it remains viable on surfaces for days in suitable atmosphere.^[25] The following measures can be adopted by dentists to prevent further spread of coronavirus and reduce the chances of cross transmission from patients to dentist or vice versa.

- a. Chemical disinfectants which are effective against coronavirus are household bleach, sodium hypochlorite, hydrogen peroxide, etc. Viral load is reduced by more than 3 logs within 5 min.^[26] For cleaning of floors of dental hospitals and clinics, no sweeping should be done. The floors should be mopped with detergent water, then plain water and in the last with 1% hypochlorite solution
- b. Respiratory samples containing the virus are found to be infectious for around 7 days at room temperature. Viability of coronavirus is more on plastic/disposable gowns than that on cotton gown surfaces. This can be due to absorbent nature of cotton. Hence, it should be preferred
- c. Risk of infection through card of patients and other papers is very less as the virus cannot be recovered after the drying of a paper form even with a high inoculum^[26]
- d. Standard precautions should be applied routinely in all health-care settings (hospital or private clinics) for all patients (symptomatic or asymptomatic)

Standard precautions are most importantly, hand hygiene; and second, use of personal protective equipment (PPE). Gowns, shoe cover, gloves, face mask, eye protectors, and head cap should be worn properly to avoid direct contact with secretions and body fluids of the patients. Sharp and needle stock injury should be strictly avoided and taken care

of. Correct sequence of donning and doffing of PPE should be followed along with biomedical waste management. Safe disposal of wastes and used PPE should be done in assigned area and color-coded bins. There should be regular checking and certification by administrative and regulatory bodies.

- e. When performing an aerosol-generating procedure: Use PPE (full gowns, double gloves, eye shield, and particulate respirators like N95). The procedure should be performed in a well-ventilated room. This means negative pressure rooms with minimum of 12 air changes per hour or 160 L/s/patient in facilities with natural ventilation. People in the room should be minimized to only very necessary individuals^[27]
- f. Any person showing any respiratory symptoms such as coughing, sneezing, or runny nose should be encouraged to follow respiratory hygiene. That is, nose and mouth should be covered with either medical mask or cloth mask. If no mask is available then at least disposable tissues or even flexed elbow can be used to cover nose and mouth while coughing and sneezing. Thorough hand washing should be done if hands come in contact with respiratory secretions
- g. Hand hygiene.
 - It includes cleansing of hands with soap and water or the use of an alcohol-based hand rub (ABHR), containing at least 70% alcohol for inactivating coronavirus
 - If there is visible soiling of hands, then soap and water is required for washing
 - ABHR is preferred if soap and water is not there and there is no visible soiling
 - Hand hygiene is an essential and repeated step in donning and doffing of PPE. Wearing PPE does not mean that hand hygiene is not required.^[28] Unintentional touching of eyes, nose, or mouth by gloved or ungloved hands by health care workers. Touching one's face with contaminated hands can result in self inoculation of virus and one can get infected. Cleaning and disinfection protocols should be followed vigorously and consistently. This should be checked and ensured by all working in that area. All the surfaces in the working environment should be cleaned with detergent water and disinfectants (such as sodium hypochlorite). This is an effective and sufficient procedure for surface disinfection.^[29,30]

CONCLUSION

The fact that dentists are susceptible to many nosocomial infections and cross-transmission of diseases is often neglected. Reporting of health associated infections in dentists is very less, along with documentation and publications.^[31] Reports suggest that healthcare-associated infections are underreported in literature from the developed world. Hence, the situation may be worse even worse

in developing nations. Therefore, healthcare-associated infections are under-reported in literature from the developed world. The potential threats of COVID-19 are still underestimated. As long as accurate data are absent, the dental team should be fully aware of the risk of dissemination of this potentially hazardous virus and ensure that efficient cross-infection control procedures are being followed.^[32]

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Declaration of patient consent

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Conflicts of interest

There are no conflicts of interest.

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