

COVID-19: Impact on Dentistry

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Abstract:

In December 2019, an outbreak of coronavirus disease, caused by a novel severe acute respiratory syndrome coronavirus -2 (SARS-CoV-2) was reported. They are the large family of viruses causing illness from common cold to most severe disease such as MERS (Middle East Respiratory Syndrome) and SARS (Severe Acute Respiratory Syndrome). 2019-nCoV belongs to the family of single-stranded RNA known as Coronaviridae. This disease was originated in Wuhan, China in late December 2019. 1st reported case outside china was diagnosed with COVID-19 in Japan on 20th January 2020. WHO on March 11th declared it as a Pandemic. The purpose of this article is to summarize its mode of spread, clinical signs, and symptoms, method of prevention, and the effect of this disease on dental clinics.

Keywords: Pandemic, COVID-19, Preventive Measures

Introduction

COVID 19 is derived as CO- Corona VI- Virus D-disease and 19 as it originates in the year 2019. Credible evidence is available that this novel coronavirus has a resemblance to that coronavirus species found in bats, pangolin confirming the zoonotic nature of this new cross-species viral-mediated disease.¹ Disease is transmitted by human to human contact. This disease was named as the 2019-novel coronavirus (2019-nCoV) on January 12th, 2020 by WHO.² It is believed that symptoms of 2019-nCoV infection occur within 2 to 14 days following infection. Preliminary information suggests that older adults and persons with underlying health conditions or compromised immune systems might be at higher risk for severe illness from the virus.³ Sources of contamination are patient's saliva, aerosols.

Modes of transmission:

1. Since it is a virus, it requires entry into individual human cells to infect the human host. Once inside, the virus binds to proteins that the cell normally uses for its functions, essentially hijacking the cell and converting into a coronavirus factory, which then spills out and spread to new cells.⁴
2. Disease is transmitted to humans through person to person contact, droplets, aerosol and fomites.
3. Virus enters the mucous membrane of the mouth, nose, and eyes. It can be transmitted between people via respiratory droplets and contact routes.
4. Transmission of the virus can occur directly by contact with infected people, or indirectly by contact with surfaces or with objects used on or by the infected person such as a thermometer, stethoscope.⁵
5. Virus has been reported to remain infectious on inanimate surfaces in the range between 2 hours-9 days.⁶
6. Patient with dental treatment leads to the production of aerosol which can also be the reason for transmission of disease.

7. Coughing and sneezing from an infected person to another person.
8. Person on close contact within the radius of 6 feet.

Signs and Symptoms⁷

They can be classified into major or minor symptoms.

Major

1. Fever
2. Dry Cough
3. Running nose
4. Difficulty in breathing
5. Loss of smell and taste
6. Sore throat

Minor

1. Headache
2. Myalgia
3. Nausea
4. Diarrhea
5. Loss of appetite
6. Nasal Congestion

Patient with age above 60 years and immunosuppressed patients shows atypical symptoms. Notably early symptoms in some patients can be very mild or unspecific.

Effects on dental clinics and efforts to prevent the spread of infection:

1. Only emergency treatment or urgent care should be provided. These include acute pain, swelling, abscess due to infection or fractured teeth, bleeding due to acute periodontitis, broken denture, extensive dental caries causing pain, etc.
2. The patient should be recommended through remote consultation on maintaining good oral hygiene.
3. The patient should book an appointment before visiting the dental clinic.
4. Telecommunication, regular sanitization, use of HEPA filters, thermal screening
5. Informed consent, Self-declaration form should be signed by the patient.
6. Thermal screening or pulse oximeter check should be done before allowing the patient to sit on a dental chair.
7. Ask the patient not to bring anyone to the clinic unless very urgent. Waiting chairs placed preferably a 3 meter apart.
8. A detailed history of the patient, regarding symptoms, traveling, large gathering, 1st line defense patient.
9. De-clutter all work surfaces in the treatment area. Set out only the instruments that are indispensable for the treatment to be performed.⁸
10. Strictly follow hand hygiene protocol according to the WHO "Five Moments".
11. Use of Personal protection equipment such as gloves, face shields, eye protection, medical mask, fluid resistant disposable gown.
12. Ask the patient to do a mouth rinse before treatment. 1% hydrogen peroxide or 0.2% Povidine iodine for 20 seconds.
13. The visual or tactile examination should be performed, without an intra-oral x-ray.
14. HEPA Filters or UV light should be installed in clinics to decrease aerosol production as they are the air cleaning system.⁹
15. High volume extra oral suction to be used.

16. Avoid the use of a fan during the procedure.
17. Maintain proper ventilation with natural air.
18. After each patient, room with a dental chair should be sanitized.
19. For payment digital or online mode should be used.
20. Maintain social distancing.
21. All staff members should follow strict rules of personal hygiene such as donning and doffing of PPE, avoid the use of personal attire, and hand hygiene.

Disinfection of Dental Clinics

The virus can potentially survive for several days or hours. So, it is very important to clean the surfaces before its re-use. For floors 2 steps cleaning should be performed (freshly prepared 1% sodium hypochlorite with a contact time of 10 minutes). Damp dumping should be done in straight lines that overlap one another. Frequency: before starting daily work, after every procedure and after completion of the treatment. Electronic equipment should be wiped with alcohol-based rub swab before each patient.¹⁰

Impact of COVID-19 on Dental Schools and Colleges

1. Both dental undergraduate and postgraduate teaching halted their daily face to face teaching, hands-on training.
2. American Dental Education Association had introduced certain teaching modalities such as online education. Dental educators are providing with the opportunity to modernize their approach to appropriate pedagogy via new digital concepts as well as enhancing online communication and usage of learning platforms.
3. The recent advancement of haptic technology has fitted the virtual reality simulators to bring a range of educational opportunities in dental school. It can provide tactile feedback that allows the trainee to feel and touch virtual teeth.¹¹
4. There is decrease in working capacity of the dental schools. 96% of clinical work was performed by senior staff with only 30% of post-graduate students.
5. Undergraduate students have been asked to help only in non-clinical activities.¹¹

Preventive Measures

1. **Patient evaluation and screening** using Infrared thermometer, Pulse oximeter, and a detailed history of the patient. Questioning patient regarding history of fever, the history of travel to the epidemic area, history of contact with an infected area.
2. **Screening and triage of the patient:** Screen patient either by virtual technology or telephone.¹²
3. If urgent oral health care is medically necessary for a patient who has or is suspected of having, COVID-19, the patient should be referred to specialized oral health care with appropriate measures.
4. Maintaining a physical distance (at least 6 feet) with other individuals.
5. Wear a mask to cover the nose
6. Avoid large gathering
7. Perform hand hygiene by washing hands with soap or handwash.¹³
8. Regular exercise, eating food rich in Vitamin C, Zinc.
9. Use of sanitizer (alcohol-based), when outside if water not available.
10. Avoid touching eyes, nose, and mouth.

10. Avoid touching eyes, nose, and mouth.
11. Routine cleaning and disinfection of environmental and other frequently touched surfaces.

Future trends

The need for a vaccine is the utmost requirement in this pandemic. Scientists began working on the coronavirus vaccine. There is various platform looked at for the development of its vaccines. These include RNA, DNA, non-replicating viral vectors, and inactivated vaccines.¹⁴ Vaccine development traditionally takes 10–15 years and to condense this to a period of only 15 months comes with its drawbacks and challenges. Accelerating vaccine development by combining phases involves trials being done on smaller groups. Most of the vaccines are in the trail II or trail III phase. Many companies all around the world are trying to introduce vaccines such as Moderna and Pfizer Inc.

As claimed by the company, Moderna vaccine against COVID-19 is strongly effective as it reduces the risk of infection by 94.3%. It is a Biotechnology company pioneering mRNA therapeutics and vaccines to create a new generation of medicine for patients. Pfizer vaccine has also completed a Phase III trial. It is believed to be 95% effective. It was cleared by the UK in late November 2020. Until a vaccine is not discovered precaution is the only way to prevent infection.

Conclusion

Practicing dentistry in the current pandemic situation is challenging. But the use of the virtual assistance method represents a good option for managing patients. Reinforcing strict infection control measures and minimizing personal contact and aerosol production helps to control the spread of infection. As dental health professionals it is our duty to prevent the spread of this deadly pandemic and at the same time meet up to the expectations of our dental patients who are in need with greater care and following precautions as advised by the higher health authorities, then only we would be able to contain this disease.

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