

Corona Virus: Its Effects and Management in Dental Practice-A Review

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ABSTRACT

Background: This article inspects current COVID-19 pandemic in relation to the dental practice. Dental professionals are always been exposed to various life-threatening diseases. Coronavirus is very different from other conditions since it is highly contagious and has a long incubation period with the main source of transmission in the form of aerosols. So, there are needs to discuss its effect, prevention protocols and management in dental practice.

Keywords: COVID 19, dentistry, management.

INTRODUCTION

Coronavirus pandemic was first identified in Wuhan, Hubei Province, China, in December 2019. It is a continuing pandemic of corona virus disease 2019 (COVID-19), caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).^[1] The World Health Organization (WHO) announced it to be a Public Health Emergency of International Concern on 30 January 2020 and acknowledge it as a pandemic on 11 March 2020.^{[2][3]} It is an infectious disease which spreads through close contact with the affected person or via small droplets transferred in the form of sneezing and coughing and is not generally considered as an airborne disease, so prevent the expansion of the outbreak quarantine measures are applied.^{[1][4][5][6]}

Face and infected surfaces are more prone areas to catch COVID-19. No vaccine or any antiviral dose is discovered till date to prevent the spread of this disease^{[4][5]}. This outbreak results in reduced supply in daily goods, closure of all institutes, school, colleges either countrywide or on a daily basis.^[7]

Signs and symptom

The two most usual symptoms are fever (88%) and dry cough (68%). Less common symptoms include fatigue, respiratory sputum production (phlegm), loss of the sense of smell, shortness of breath, muscle and joint pain, sore throat, headache, or chills.^{[8][9]} The U.S. Centres for Disease Control and Prevention (CDC) lists emergency symptoms as difficult breathing, tenacious chest pain or pressure, sudden confusion, and bluish face or lips; immediate medical care is advised in the presence of these symptoms.^[10]

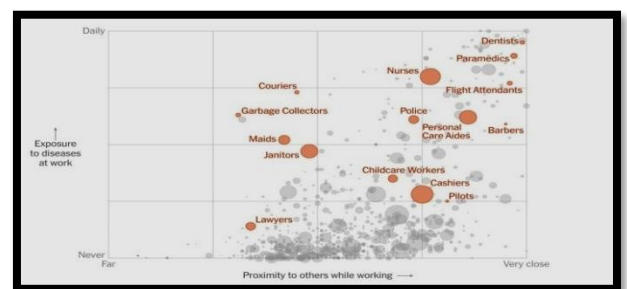


Fig 1: Percentage of exposure to Covid-19 amongst the healthcare and related professionals (Dental surgeon at the top)

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Further spread of the disease can cause severe pneumonia, acute respiratory distress syndrome, sepsis, septic shock and death. So people in intimate contact with the affected person should be examined properly.^{[11][12]}



Fig2: Commonest Symptoms of Covid-19

Diagnosis

General basis:

The provisional diagnosis is on the basis of symptoms, though confirmation is eventually by Nucleic acid amplification tests (NAAT) such as reverse transcription-polymerase chain reaction (RRT-PCR) of infected secretions either respiratory or blood samples or CT imaging.^[13]

Dental basis:

Triage practice should be followed at every clinic. Complete screening of the patient is to do before the start of any procedure. A form should be filled up before the start of treatment which gives detailed information about any travel history, any kind of the previous infection in the body, and any recent contact with the infected person or the person who has travel history. Symptomatic signs such as fatigue, fever, and dry cough mainly should be checked along with vital signs. It is preferable to start diagnosing problems telephonically or through online services.

Control recommendation and interim infection prevention in healthcare settings (e.g., dental triage)^[14]

Recommendations

1. Reduce the chance of exposure

Measures should be taken before the appointment and during the meeting, throughout during patients

visit, and followed till the time patient's room is appropriately clean and disinfected once again.

2. Adhere to Standard and Transmission-Based Precautions (Mouth mask, gloves, gowns, eye protection.)
3. Limit patient's movement in the clinic areas. Start using portable x-rays
4. Take more precautions while carrying out aerosol-generating procedures.- try to use N95 mask for mouth coverage.
5. Train and Educate Healthcare Personnel.
6. Implement Environmental Infection Control- daily cleaning and disinfection procedures are suitable for SARS-CoV-2 in healthcare settings, especially those patient-care areas in which aerosol-generating procedures are done.
7. Implement Engineering Controls- physical barriers or partitions to guide patients through triage areas.



Fig 3: Universally accepted Preventive measures of Covid-19

History repeats itself^[15]

Sometime certain incidents and events in life will somehow revisit. Orangeburg quarantine of 1920 and Americas forgotten pandemic 1918 is a condition arose due to flu or Influenza and affected large population. It turned fatal for at least a half-million Americans. It lasts for almost two months and embossed its mark and impact on population for a longer time.^[15] Since the fourteenth century, quarantine has been the foundation of a synchronized disease-control strategy, which includes isolation, sanitary cordons, bills of health issued to ships, fumigation, disinfection, and management of groups of persons who were

imagined to be answerable for escalating the infection.^[16,17]

In the plague epidemic of 1347–1352, medicine was impotent, and the only way to escape from infection was to avoid contact with infected persons and contaminated objects.^[17,18] Another epidemic called Cholera which is an Asiatic disease appeared during a period of increasing globalization and reached Europe in 1830 and the United States in 1832, petrifying the populations ^[17]. Despite progress regarding the cause and transmission of cholera, there was no effective medical response ^[19] later to prevent disease, initial preventive measures of a plague that is quarantine were applied. It was so unexpected that within a few years, the different nation would again be forced to apply emergency measures in the form of 1918 influenza pandemic. Doctors persuade the use of measures like respiratory hygiene and social distancing. Quarantine and other public health operations are appropriate and valuable ways to control infectious disease outbreaks and public anxiety, but these policies are always been debatable. These measures have evolved (and continue to raise) a variety of political, economic, social, and ethical issues ^[20,21].



Fig 4: Influenza epidemic 1918



Fig 5: Orangeburg Quarantine 1920

Modes of transmission

Respiratory infections are carried through droplets of variable sizes: when the droplet specks are $>5\text{-}10\text{ }\mu\text{m}$ in diameter they are mentioned as respiratory droplets, and when $<5\text{ }\mu\text{m}$ in diameter, they are referred to as droplet nuclei. ^[22] According to recent verifications, COVID-19 virus is especially carried between humans through respiratory droplets and contact routes. ^[23, 24, 25, 26]. Dentists are more exposed to mouth splatter, so chances of transmission are more. Some evidence depicts that COVID-19 infection may cause intestinal infection and can be found in faeces. However, until now, only one study has cultivated the COVID-19 virus from a single stool specimen. ^[27]

Dentistry aerosols

Aerosols and Splatter production in dentistry is one of the biggest problems with the enhancement of infection among both dental professionals and their patients. Coronaviruses and Influenza are of main concern in the dental fraternity. These viruses are transferred from patient to dentist and vice versa through aerosols, droplets, or direct contact with the respiratory fluids of an affected person. The infected particles generated by the virus can resist survival in the air for hours. ^[28] Bacteria, blood elements, viruses, and tooth particles, saliva, debris, and tissue can all build up solid and liquid aerosols. Dental aerosols differ in composition, depending on the health standing of the patient and kind of procedure being performed. ^[29] Ultrasonic scalars generate the most ardent aerosol and splatter discharge in the dental field. The masks are worn by dentists and assistants also have an excessive level of contamination. Protective measures such as face masks also constitute the risk of infection for dental professionals and their patients. ^[30]

Management of aerosols ^[29, 31]

Prevalence of corona virus calls for preventive measures for appropriate infection control and safety of both dentist and their patients as soon as the patient enters the dental clinic. Every possible attempt should be made to prevent cross-contamination of viruses and bacteria. Thorough clinical examination, clear history and mouth rinse with effective mouth wash is prerequisite to start

the treatment. Not only rinse but sticking to the proper span of rinsing is equally important.^[29]

Protective stuff (including gloves), dental face masks that are ASTM level 3, and protective eyewear should be worn at all times during procedures. Mouth and nose should be properly covered with the mask, and should be used one time, and changed for each patient. Microbial amassing in the waterline should be avoided by flushing it every day for at least 30 seconds in the beginning and in between every patient. The appropriate positioning of a high volume suction evacuator should be done which can reduce the production of aerosols by 90%.^[31] Air decontamination in the clinic with HEPA (high-efficiency particulate air) filters, ozonization, ionization, and air sterilization are four technologies present. Some of them are not dependable in getting completely rid of the pathogen.^[31]

According to the CDC, Sterilization of handpieces after every patient is recommended. Ammonia or enzymatic detergent with water should be used daily at the end of everyday to clean suction lines. Nose filters, some masks which cover patient's nose only and eye wears should be used for their protection.^[29]

Protocols that reduce transmission of infection in dentistry ^[32]

Before starting the case, always take consent that he/she is not COVID-19 positive, and the declaration should be signed. If any suspected symptoms are shown, then Identify the case and immediately quarantine the patient and report to the infection control department as soon as possible. Do not perform the treatment.

Body temperature should be checked and questionnaire having specific questions regarding COVID-19 should be filled at the start of any treatment. The survey should have items such as: (1) Do you have a fever within the past 14 days? (2) Any experience of respiratory problems, such as a cough or difficulty in breathing within the past 14 days? (3) Do you have a travel history, within the past 14 days? (4) Do you have any communication or contact with the infected patient of COV within the past 14 days? (5) Have you come



Fig 6: Universally accepted PPE protocol.



Fig 7: Self isolation (home quarantine)

into contact with people who have travel history with recently documented fever or respiratory problems within the past 14 days? (6) Do you have any contact with many unacquainted people you would have met in any recent gathering or meetings?

Defer the treatment until 14 days if the patient answer for any screening question is "yes". If the patient's response is "no", then the dentist can proceed with the treatment with extra precautions. Following hand, hygiene is of utmost importance for dentist especially before examining the patient, before any dental procedures, after touching the patient and the surroundings and equipment without disinfection, and also after touching the oral mucosa, wound, blood, body fluid, secretion, and excreta. The dentist should be extra careful while touching their own eyes, mouth, and nose. Although dentists are not allowed to treat any patient in this pandemic time without an emergency if this occurs then special protective outwear is required. In case due to its unavailability, working clothes (white coat) with extra disposable protective clothing outside should be worn. Along with that disposable doctor's cap, protective

eyewear, face shield, disposable surgical mask, disposable latex gloves, and impermeable shoe cover should be worn.

Mouth rinses, rubber dam isolation, anti retraction handpiece, disinfection of clinic settings and management of medical waste should also be taken into consideration.

CONCLUSION

Corona virus is a highly communicable disease and quickly infects people in negligence of any precautionary measure. It affects the economy of the nation, health and public sector drastically. It has taken the world way back in its growth. Further steps should be made to prevent such outbreaks of the viruses. All should stand together to fight against this condition which is possible by self-quarantine entirely.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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