

IMPACT OF COVID-19 PANDEMIC ON DENTAL PRACTICE: A REVIEW

***Dr. Tulika Rani Roy, Dr. Sanjay Gupta and Dr. A. K Tripathi**

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***Corresponding Author**

Dr. Tulika Rani Roy

CPGIDH, Lucknow

Department of
Periodontology.

ABSTRACT

The corona virus disease (COVID-19) is a major concern these days. As a dentist we are on tremendous risk of COVID-19 infections. The splatter and aerosols that is produced during the various dental procedures leads to the transmission of virus. It can also occur through the droplets during coughing, sneezing and talking, and directly or indirectly from the saliva of infected individual. As this virus is very contagious by nature so the effect of its pandemic burst has become very challenging to the clinicians. This article presents a review of COVID-19 and its consequences in dental health care practice during and after the pandemic.

INTRODUCTION

The Pandemic burst of the COVID-19 has created emergent health situation around the world. As the transmission rate of this virus is very high thus it's very difficult to control the spread at community level. The first case was found in Wuhan, Hubei Province in China in December 2019.^[1] The world health organization had defined it as a *Public health emergency of global concern*^[2] due to the quick spread of corona virus disease (COVID-19) around the world. As a health care professional we are in high risk of the disease due to the direct contact of the infected patients. Being a health care professional we should take precautionary measures for self protection as well as treat the patients at the same time. One should also noted that the transmission rate is extremely high and unavailability of the vaccination is making the pandemic very challenging. The corona virus was firstly identified in year 1960 and the name of the virus was derived from the crown like shape of the virus.^[3] Till now there are four genera of the corona virus is known that is α -COV, β -COV, γ -COV, δ -COV. The α and β forms Infects the humans. The most invasive form for human is the β -COV form it includes MERS (Middle east respiratory syndrome), (ii)SARS (Severe acute respiratory

syndrome), iii. COVID-19 (Corona virus disease 2019) recently explored, coronavirus is single plus standard RNA virus and it belongs from to the family of *Corona viridae* (order *Nidovirales*).^[4] The origin of the Novel corona virus is zoonotic and source identified is chinese horseshoe bat. The Symptoms of this disease includes fever, cough, headache, muscular fatigue. Severe forms shows pneumonia, bronchitis and renal involvement.^[5] Recently this virus is named as “SARS-COV-2” (Severe acute respiratory syndrome corona virus -2) by International committee of taxonomy of virus (ICTV). The transmission of this virus can occur through the contact of salivary and nasal secretions, also through the objects infected with these secretions. Fecal-oral route transmission and transmission from mother to fetus via placenta is also possible. As the incubation period of the virus ranges from 1-14 days so transmission through asymptomatic patients is also possible.^[6] In some cases transmission through the recovered patients can also possible.^[7] It can be also transmitted through the oral mucosa and cornea, eye provides a easy gateway for the entrance of micro droplets. In dental setting the transmission can easily occur through the microdroplets and aerosols generated during the day to day clinical procedures. Also the object inside the dental cabinet/clinic can also be infected by the microdroplets and aerosols. Thus the proper precautionary measures are very important for the clinician to protect themselves as well as to prevent the further transmission.

Consequences of COVID-19 pandemic in dental Practice

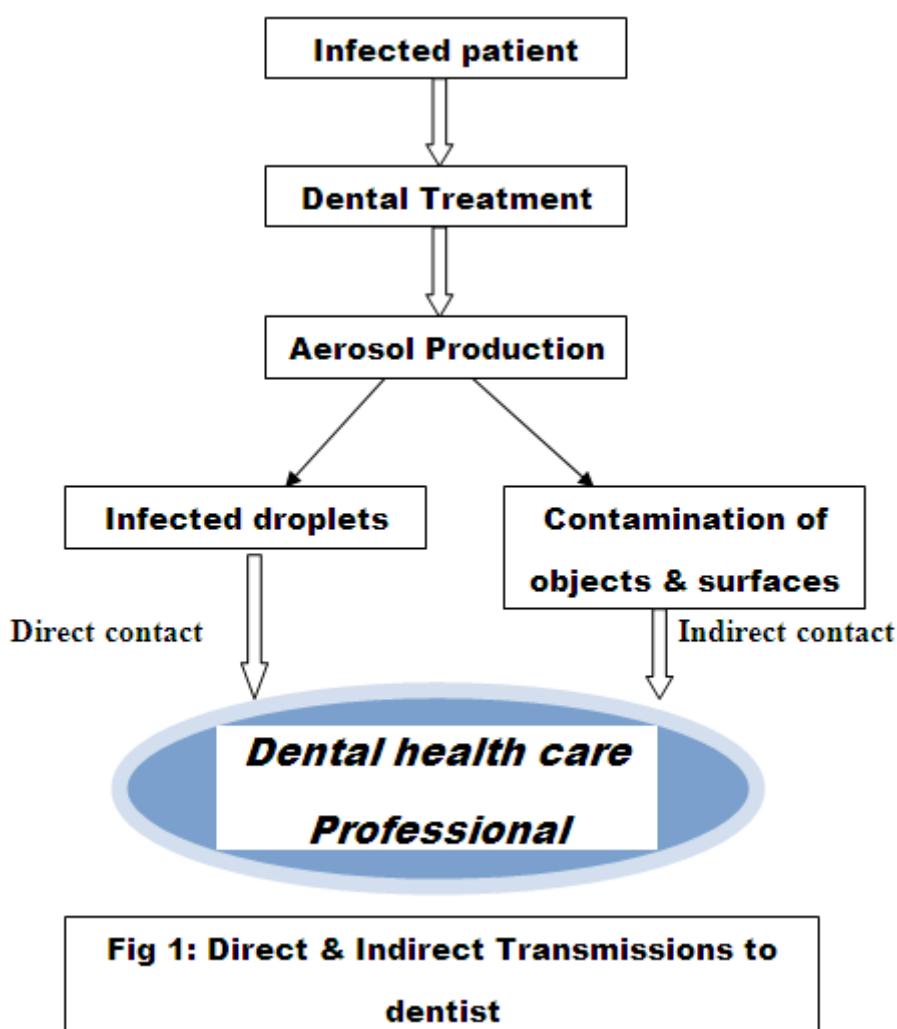
The outbreak of this pandemic has significantly challenged the dentistry. In many countries including India the regular dental treatment procedures has been stopped in high risk zones. As per recent studies saliva and salivary gland have higher potency to harbor this virus. The role of dental health care professionals is critically important in prevention of further transmission.

Possible transmissions in dental clinics

1. Transmission by aerosols: Transmission through the aerosols is most prevalent form of contamination the dental setting area. The respiratory droplets of infected individual leads to the contamination of the surrounding objects and area of the dental cabinet. Studies has been shown that coronavirus has a special ability to survive for long periods in the aerosols.^[8] Many papers has been presented that multiple dental procedures produces aerosols contaminated with the virus.^[9] Thus the transmission of droplets and aerosols are main concern in the dental clinics.

2. Transmission via contaminated surface and objects: Recent studies suggests that SARS-CoV-2 can easily survive in dry surfaces specially when it suspended in human secretions.^[10] It has ability to survive on the surfaces of porous and non porous objects such as rubber, latex, different types of fabrics and paper.^[11] Therefore the contaminated objects and surfaces of the dental cabinet can easily transmit the disease.

3. Transmission by contact: The dental care professional remains on high risk due to direct or indirect contact with the respiratory droplets as well as the aerosols as mentioned above. Also the contaminated dental instruments surfaces also leads to the dental health care professional on risk.



Dentistry and COVID-19 decision making

The spread of the virus has become a major concern for the dental clinics as well as the dental and medical schools in the affected countries. It is very important to have a decision over to

treat the patient or to not. During this pandemic burst it is advisable to all the dentists to treatment should be provided on the case selection basis and only the emergency treatment should be provided. A proper history of the patient should be taken, so that evaluation of risks over the patients can be done. A proper questionnaire should be made to evaluate the proper history of the patients for treatment planning.

Table 1: Questionnaire for patients when they come to Clinic.

Serial no	Questionnaire for the patients	Answers recorded
1.	Travel History : have you travelled or met anyone who have travelled to countries and cities infected by the COVID-19 (location and time should be noted)	Yes/No
2.	In past 14 days you or anyone from your family has contact with COVID-19 patient.	Yes/No
3.	Have you any of these symptoms :fever, cough, cold, difficulty in breathing, muscle pain etc.	Yes/No
4.	Have you had any recent contact with the patients with above symptoms.	Yes/No
5.	Question on dental pain: do you have uncontrolled pain or infection, swelling, bleeding or any trauma.	Yes/No

After recording the answers of the patients the treatment planning should be done accordingly. During the questionnaire session it should be taken care of that the proper precautionary measures should be taken as close contact and talking can lead to transmission of virus via respiratory droplets as mentioned above. If the response given by patients is positive, treatment should be scheduled to next date and patient has to be informed for all the possible risks of being infected, all the hygiene measures should be explained to the patient and ask them to report to the health authorities for the further investigation.^[12]

Measures for Infection control

The decision making for the treatment is an important need. If possible firstly teleconferencing should be done. Only the emergency cases should be treated with all the precautionary measures following strict infection control should be followed during the treatment procedures.

Protection measures for Clinician and staff

Before starting and treatment procedure patient is advised to do mouthwash with 2% chlorhexidine to decrease the bacterial load in oral cavity. Helping staff should wear disposable head caps, mouth masks, cloths, face shield and hand gloves. The Clinician must wear the personal protective kit (PPE) that includes goggles, mask, face-shield, gloves,

gowns (with or without aprons), head cover and shoe cover. The ministry of Health and Family Welfare, Emergency medical relief, Government of India, has given a proper advisory on the use of PPE for the health care professional.^[13] They have elaborated the requirement of PPE, specifications for each component and also risk wise advisory on the use of the PPE. Treating the emergency cases with the strict precautionary measures leads to no risk on the clinicians.

Modification in dental Clinic Setup

During and after the pandemic the modification of dental clinic setup is remains urgent need. The protocols issued by dental council of india (DCI), has suggested all the measures and guidelines that should be followed in the dental clinics or hospitals. They have adviced to prepare the dental operatories in three phases:

- i. Preparatory Phase,
- ii. Implementation Phase and
- iii. Follow up

The *preparatory phase* includes, prophylaxis against the COVID-19 for dental health care professionals, that includes; testing for the COVID-19 before resuming the work in the clinic or hospital^[14] and the hydroxychloroquine prophylaxis.^[15] Preparation of dental clinic that includes, management of ventilation and air quality in the clinic, the air circulation with the natural air through frequent opening of windows should be done. During the procedure the ceiling fans should be avoided and strong exhaust fan should be use for unidirectional flow of air. The window air condition system should be frequently cleaned and serviced so that the accumulation microdroplets and aerosols should be avoided. The display of visual alerts and display should be provided at the clinic entrance, receptions and waiting areas to educate the patients about the respiratory hygiene, cough etiquette, social distancing and disposal of contaminate tissues in trash cans. Glass and plastic barrier should be used at reception desks. The distancing of chairs (at least 1 meter) should be done at waiting area. Cashless or contact less payment system should be preffered.^[16] For clinician hand hygiene measures should be followed as per guidelines given b the world health organization (WHO).^[17] Disinfection protocols should be strictly followed in the dental clinic.

The *implementation phase* includes tele-consult and tele screening as primary step in the treatment procedure. A proper dental history is taken and evaluation of severity of the disease should be done. If possible patient management should be done by advising the analgesics

and local measures. Only pre-appointed patients should be entertained unless and until there is no any life threatening emergency cases. Patient is advised to not to carry any extra accessories and bags when they come to the clinic. The use of facial mask is important need when they enter the clinic and maintainance of social distancing is advised inside the waiting room. The biomedical waste management area should be equipped with bins as per government of india guidelines.^[18] Before closing the clinic proper disinfection protocols should be followed. The 2019-nCoV remain infectious on many inanimate surfaces upto 9 days, the disinfection of the surfaces and objects by 0.1% sodium hypochlorite or 71% ethanol is found significantly effective against the virus infectivity.^[19] Fogging should be done that is no touch surface disinfection, for this commercially available hydrogen peroxide is 11% (w/v) solution which is stabilized by 0.01% of silver nitrate can be used.^[17]

The patient follow up and review should be done once in 24 hours and in a week telephonically to know the status of the patient, also to know if he/she has developed any symptoms related to COVID-19.

What to do if accidental exposure occurs

As the asymptomatic period of COVID-19 patients can lasts for 0-14days in some cases it is reported as 0-24 days. Thus it very likely possible that dentist can treat an asymptomatic patient. If unexpected exposure occurs to the clinician following steps should be taken;

1. Get tested for COVID-19 as soon as possible.
2. If the report is positive the clinician should be quarantined for 14 days and further treatment should be taken.
3. Clinician should provide list of the patients that has been treated after the exposure as well as list of all people he met after the exposure.^[20]

Evaluation of patient history is very important to reduce the risk on the clinician as well as dental staffs and other patients too. The proper history taking through the telescreening decreases risk factors around the dental cabinet. Also patient education is responsibility of the clinician to develop a risk proof surrounding. The patient education includes washing hands frequently, avoid touching your face, eyes or nose, Cover the mouth with elbow during sneezing and coughing, stay at home if he/she feels sick.

CONCLUSION

This pandemic outbreak has put all the health care professionals on risk. Being a dental health care professionals we are frontline workers and cannot deny to treat the emergency cases. Its very important for the dentists to know the all the transmission modalities of novel corona virus 2019 (2019-nCoV), identification of the infected patients through the sign and symptoms and the most important is the self care considerations. A higher rate of virus exposure is associated with the dental health care professionals due to the occupational commitments for their work. Now its time to change do treatment modalities with the higher safety measures to minimize the risk of infection in all aspect of dental practice. During this pandemic burst situation the moral duty felt by the dental professionals is to reduce the routine dental procedure as chances of transmission remains high among their patients and beyond, but on the other hand financial consequences cannot be ignored. In this review we have suggested all the possible consequences of the pandemic burst of Covid-19, advisory for the patients, and all the precautionary measures that should be taken by the dental health care professional. This is the time we need to support each other in our professional family and look out for our mental health as well as our wellbeing.

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