REVIEW ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare & Pharmascope Foundation Journal Home Page: www.ijrps.com

# Dental treatment during the lock down period — safe or not

Neha N[1], Anjali A. K[2], Brundha M. P[*3], Jayalakshmi Somasundaram[4]

[1]Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai- 600077, Tamil Nadu, India
[2]Department of General Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai- 600077, Tamil Nadu, India
[3]Department of Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai -600077, Tamil Nadu, India
[4]White Lab - Material research centre, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai- 600077, Tamil Nadu, India

*Article History:*

Received on: 20 Jul 2020
Revised on: 15 Aug 2020
Accepted on: 19 Aug 2020

*Keywords:*

Coronavirus,
COVID-19,
SARS-CoV-2,
lockdown,
droplet infection,
aerosols,
dental treatment

ABSTRACT

The coronavirus causing COVID-19 is officially named as SARS-CoV-2. The coronavirus disease 2019 (COVID-19), which originated in Wuhan, China, has become a major public health concern all over the World. Infection control measures are necessary to stop the virus from spreading further and help to manage the pandemic situation. Many countries have implemented lockdown measures and social distancing to slow down or prevent the spread of COVID-19 pandemic. This implementation is believed to possess a significantly decreased rate of growth and increased doubling time of cases. Due to the spread through respiratory droplets, the incidence of infection will be high between patients and dental practitioners. The dental clinics and hospitals within the containment areas of COVID-19 should follow infection control protocols precisely in order to confer safety to both the patients and the practitioners. This article thus provides important and requisite knowledge about COVID-19 and therefore, the restrictions and strict protocols to be followed for or while undertaking dental treatment during the crucial lockdown period of COVID-19.

*Corresponding Author

Name: Brundha M. P
Phone:
Email: brundha.sdc@saveetha.com

ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11iSPL1.3071

Production and Hosted by

IJRPS | www.ijrps.com



## INTRODUCTION

The SARS epidemic has uplifted the interest in research on biodiversity and genomics of coronavirus. Before 2003, there were only 10 coronaviruses known; but after the SARS epidemic, there was an addition of 16 genetically sequenced coronaviruses. On January 8, 2020, the coronavirus was officially declared as the causative organism of COVID-19 by the Chinese Center for Disease Control and Prevention. The coronavirus disease 2019 (COVID-19) was first reported in Wuhan, China, in December 2019 and has now become a serious public health problem not just for China but also for other countries, presenting as a serious pandemic disease causing the death of people at a high rate, throughout the World.

On January 30, 2020, the WHO announced that the outbreak of COVID-19 had become an international public health concern due to gradual increase in the death toll (Mahase, 2020). The novel corona virus

was initially named 2019-nCoV and then officially as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). It initially started as an endemic in China, but its faster rate of spread throughout the World has made it a pandemic disease.

Coronaviruses are enveloped, single-stranded, positive-strand RNA viruses that belong to the family Coronaviridae (subfamily Ortho coronavirinae) which is largely the family of respiratory tract pathogens of mammalian and avian species. The family is classified within the order Nidovirales and under 4 genera, namely alpha, beta, gamma, and delta. CoV is a beta type. Four lineages are recognized within the Beta-CoV genus, namely A, B, C, and D. The taxonomy of coronaviruses is predicted based on their structure. Corona means crown-like morphology. These viruses represent large pleomorphic spherical particles with bulbous surface projections resembling a crown (corona-crown like) morphology in electron microscopy.

There were different types of coronaviruses (non-human) depending on the organisms susceptible (other than humans) which include Murine coronaviruses (primarily affecting the liver and the brain of mice), Porcine coronaviruses (causing viral enteritis and fetal diarrhoea in pigs), Avian coronaviruses (which spread by aerosols, replicated in upper respiratory tract causing infection of bronchi and severe diseases in birds), Feline enteric coronavirus (FeCoV) (which caused severe and lethal diseases in Cats) and Bovine coronaviruses (causing respiratory and enteric disease in cattle).

Before SARS-CoV emerged, there were only two prototypes of human coronavirus, which were the etiologic agents of mild respiratory diseases like the common cold. Since the 21st century, Coronaviruses (CoVs) have caused outbreaks of pneumonia in humans. In November 2002, SARS-CoV (Severe acute respiratory syndrome coronavirus) emerged, which was the causative organism of the SARS epidemic in China, the first serious illness caused by a coronavirus in humans. It is assumed that the SARS-CoV could have arisen from a non-human host (mostly horseshoe bats) that somehow developed or acquired the ability to cause infection in human subjects and had a fatality rate of 9.6%.

Later in September 2012, Middle East respiratory syndrome coronavirus (MERS-CoV) emerged, causing MERS, which was acquired as a zoonotic infection from dromedary camels to humans in Saudi Arabia and spread across 27 countries. It was reported to possess a death rate of 34.3% mainly among household members and health care workers (HCWs). Mode of transmission for both MERS and SARS was through respiratory droplets and close contact and caused symptoms of upper and lower respiratory tract infections. Interestingly, COVID-19 is additionally following the identical pattern as MERS and SARS. There have been no cases of SARS in the recent 10 years, but MERS is an ongoing health problem.

**Structure of coronavirus**

The pathology of any disease is difficult to understand. Morphological identification is the key to understanding the pathogenesis of any condition, and histopathology provides confirmatory information about any suspected condition that could have been missed in clinical diagnosis. Proper diagnosis and management of the patient are incredibly important. Thus, knowledge about structure is very important to verify the presence of COVID-19. Coronaviruses are spherical, 125 nm in diameter, having spikes projecting from their surface, resembling a solar corona (Malik, 2020).

The envelope of the infective form of the virus consists of three proteins, the spike protein (S) which initiates viral attachment and entry, the membrane protein (M) and the envelope protein (E), responsible for assembly and also the inter cellular fusion of infected cells; aiding the replication of the virus inside the body of the host. COVID-19 differs from other coronaviruses due to the presence of an additional protein called hemagglutinin esterase (HE) (Belouzard *et al.*, 2012). Thus, it is identified by encoding the additional glycoprotein that has acetyl esterase and haemagglutination.

**Covid-19**

According to the information available through recent researches, SARS-CoV-2 is also assumed to possess a zoonotic origin, the Chinese horseshoe bats being the most predictable origin. Studies suggest that many individuals who initially acquired the disease were related to the animal market in Wuhan city, highlighting the likely zoonotic origin of COVID-19. SARS and MERS have relatively higher fatality rates than COVID-19, yet COVID-19 is more infectious because the underlying SARS-CoV-2 virus has spread more easily among humans, resulting in the highest number of case reports.

Although COVID-19 has a lower death rate and a higher recovery rate, the number of deaths from COVID-19 so far surpasses that of SARS and MERS. The disease has manifested as an asymptomatic infection or with symptoms of mild to severe pneumonia, resulting in an outbreak of viral infection (Bai *et al.*, 2020).

**Mode of transmission**

The corona virus has succeeded in making its transmission from animals to humans within the seafood market of Wuhan, China. COVID-19 is caused by a beta-coronavirus named SARS-CoV-2, which contains a faster transmission rate and affects the respiratory tract and manifests as pneumonia in humans. The transmission is through droplet infection which can be either direct (person to person contact, touching the mucus of the nose and then rubbing eyes (Ferdioz and Brundha, 2016), face) or indirect (through fomites, aerosols are driven by cough or sneeze of an infected person).

**Clinical presentation**

COVID-19 most commonly manifests as fever, dry cough, and tiredness. Less common symptoms include headaches, pharyngitis, sore throat, diarrhea, conjunctivitis, loss of taste or smell, skin rash, discolored fingers, or toes. Serious symptoms include shortness of breath, chest pain, pressure on the chest, loss of speech or movement (Cascella, 2020).

**Treatment**

There is no specific drug that could be used in the treatment of COVID-19. Although many drugs are being tested, and several other trials are being carried out for the event of the development of vaccines. For now, the treatment provided is symptomatic supportive therapy (Huang, 2020) and a course of pro biotics also accompanied by the antibiotic treatment (Ananya *et al.*, 2020).

The efficacy and safety record of Chloroquine has suggested the assessment of inhibition of viral replication in patients suffering from COVID-19; however, the results are inconclusive. Maintaining a sound immune system is vital in combating the disease. Vitamins are important to maintain immunity. Individuals are more susceptible to infections when there is a deficiency of Vitamins (John and Brundha, 2016).

Several home remedies can be employed to combat Vitamin deficiencies, e.g. use of Apple cider vinegar for Vitamin B1, B2. B6, and C deficiency. Chia seeds (Akash *et al.*, 2020) serve as super foods for improving immunity against respiratory infections. Immune compromised people falling under children, and older age groups, diabetes patients (Kumar and Brundha, 2016), etc. are at a higher risk of susceptibility to infections (Preethikaa and Brundha, 2018). One of the postoperative complications of dental treatment seen in diabetes patients is taste dysfunction (which could be confused with the symptom of corona virus). Acquired oral fungal and bacterial infections have also been reported in patients with diabetes.

**Lockdown period of covid-19**

Many countries have implemented lockdown measures to slow down the spread of COVID-19 pandemic, putting more than one-third of the World's population under mobility restrictions. An assumption behind the lockdown measures is that the rate of spread of infection will reduce naturally followed by suppression. In the absence of vaccines and treatment, the only effective ways of controlling the spread of infection appear to be the implementation of lockdown and social distancing measures.

Strict and stringent measures are required to reduce the route of transmission. Contact transmission should be reduced to the maximum amount as possible. Due to the introduction of these regulations, the Lockdown is showing the desired effect on the pandemic curve and has almost flattened the epidemic curve.

**Impact of lockdown**

**Positive impact**

Lockdown has decreased the growth rate of COVID-19 and increased doubling time of cases in China. More strict and stringent confinement of individuals in the containment zones and higher risk areas seem to be having the potential of slowing down the spread of COVID-19.

**Negative impact**

One of the consequences resulting from COVID-19 in India is the spread of wrong information and blame. The violence against the health care workers has increased and stigmatization of individuals with or suspected COVID-19, driven by fear which could prevent or delay the reporting of illness.

The pandemic has also resulted in fanning anti-muslim sentiment and violence as being answerable for the spread of many cases Lockdown has appeared to have given the low-income groups a difficult choice to make between health and income. It has resulted in devastating short and long term effects as a result of which the mobility gap phenomenon is observed. It has also been observed that Lockdown has increased the incidence of mosquito-borne diseases.

**Cross infection in dentistry**

Cross-contamination and cross-infection can occur via direct contact with microorganisms or indirect contact with contaminated objects, droplet transmission, and inhalation of air-borne pathogens (Abichandani and Nadiger, 2013). Owing to the high pollution in our surrounding, people of all age groups are affected by respiratory diseases,

among which wheezing is very common. Cough and sneeze from an infected patient and close contact with the patient's mouth are very risky and almost an unavoidable problem. Patients visiting dental clinics might have underlying systemic medical conditions, many of which have manifestations in the oral cavity (Shreya and Brundha, 2017).

A blood test (Dhivyadharshini and Brundha, 2020) is frequently advised by the doctors for a conclusive diagnosis of any disease ranging from anaemia to cancer, and many diseases are transmitted through blood. Thus it is important among the dentists and the patients to have obtained childhood vaccination of hepatitis, tetanus, diphtheria, and influenza to prevent the development of these infections while availing treatment.

The operatory surfaces become routinely contaminated with patients' saliva, blood, and other fluids. Cross-contamination is also possible via hands, improperly sterilized instruments (Ram *et al.*, 2020) and needle stick injury. Blood or fluid spills (Deepika *et al.*, 2020) are difficult yet very important to manage in order to prevent cross infections. Thus, proper blood/ body fluid spill management protocols have to be pre-educated and have to be followed strictly by the clinicians for their own and their patients' safety.

**SARS and dental treatment**

There was an alarming spread of SARS in health care facilities wherein a large number of healthcare workers were infected with SARS. About 21% of the reported cases of SARS were developed in healthcare workers. Strict usage of standard precautions became necessary to prevent the nosocomial spread of SARS, which include patient evaluation, preprocedural antimicrobial mouth rinse, hand hygiene, PPE like eyewear, masks, gloves, over wear, etc., and rubber dam isolation was strictly implemented to minimize the spatter of contaminated saliva, blood, and aerosols.

**Corona virus and dental treatment**

In general, people of all age groups are susceptible to COVID-19. However, people who are in close proximity with the patients of COVID-19; especially the doctors, nurses, family members, other workers and patients in the hospital are more likely to get infected The cough or sneeze, blood, saliva and other secretions generated by the patients while receiving dental treatment aerosolized the surrounding. Since the spread of COVID-19 is through droplets, the regular measures which are used routinely in daily clinical practice aren't sufficient to prevent transmission. Also, patients in the incubation period of COVID-19 are unaware if they are infected and serve as risky carriers for acquiring the disease by others.

Thus, proper masks authenticated by OSHA and NIOSH are recommended. Proper patient evaluation and use of preprocedural antimicrobial mouth rinse could reduce the number of microbes present in the oral cavity. Carrying out procedures which could result in the generation of large quantities of aerosols could be avoided to a possible extent. Extra oral radiographs could be preferred over intraoral X-rays due to the stimulation of saliva secretion and coughing. Proper disinfection practices among students and health care workers and Hospital safety can prevent the spread of communicable infections (Mounika, 2016). A sound knowledge and strict application PPE is necessary among the dentists, dental assistants, and health care workers (Ravichandran and Brundha, 2016).

Buccal smears are generally used in the diagnosis of malignancies, bacterial, fungal, and viral infections (Hannah, 2019). With the help of the non-invasive fluid "Saliva" (Merlin *et al.*, 2020), it is easy to detect COVID-19. Saliva collection is cheap, easy, and non-invasive when there is no contact with it. It could be taken in sterile containers for avoiding any kind of contact. This could minimize the nosocomial transmission of COVID-19 to the health care workers.

**Limiting dental visits to emergencies only**

In order to avoid the consequences of acquiring infections by the circumstances as mentioned above, frequency of dental visits could be decreased during the lockdown period and restricted or limited only to cases of dental emergencies like trauma, fractures, avulsed teeth, periodontal tissue damage (Timothy *et al.*, 2019) severe bleeding (Douglass and Douglass, 2003), abscess formation, xerostomia, hyperplasia (Harsha and Brundha, 2017) progressed caries, toothache or severe pain, bad breath, pulpitis, etc. and online consultations and home remedies could be taken in other non-emergent conditions.

## CONCLUSION

The pandemic of COVID-19 has a major impact on many countries all over the World. Many countries have implemented lockdown measures and social distancing to slow down or prevent the spread of the disease. Due to the spread through respiratory droplets, dentists, healthcare workers, and dental patients are more susceptible to acquire the infection. Thus, the frequency of dental visits could be decreased during the lockdown period, restricting

or limiting to only dental emergencies. Proper infection control protocols and strict usage of personal protective equipment could help in the prevention of COVID-19.

**Acknowledgments**

Authors are very thankful to Saveetha Dental College for supporting to conduct the study.

**Funding support**

The authors declare that they have no funding support for this study.

**Conflict of interest**

The authors declare that they have no conflict of interest for this study.

**REFERENCES**

Abichandani, S., Nadiger, R. 2013. Cross-contamination in dentistry: A comprehensive overview. *Chronicles of Young Scientists*, 4:51–51.

Akash, N., Rani, S. L., Brundha, M. P., *et al.* 2020. Awareness on benefits of chia seeds among college students. *Drug Invention Today*, 14(2).

Ananya, B., Rani, S. L., Brundha, M. P., *et al.* 2020. Knowledge and attitude of probiotics among outpatients visiting dental operatory. *Drug Invention Today*, 14(2).

Bai, Y., Yao, L., Wei, T. 2020. Presumed Asymptomatic Carrier Transmission of COVID-19. *JAMA: the journal of the American Medical Association*, 323(14):1406–1407.

Belouzard, S., Millet, J. K., Licitra, B. N., Whittaker, G. R., *et al.* 2012. Mechanisms of Coronavirus Cell Entry Mediated by the Viral Spike Protein. *Viruses*, 4(6):1011–1033.

Cascella, M. 2020. Features, Evaluation and Treatment Coronavirus (COVID-19). *StatPearls. Treasure Island (FL): StatPearls Publishing*. Updated on: 04 May 2020.

Deepika, R., Preejitha, V. B., Brundha, M. P. 2020. Knowledge and awareness of blood/body fluid spill management among the third-year dental students. *Drug Invention Today*, 14.

Dhivyadharshini, J., Brundha, M. P. 2020. Comparison of effects of interpretation of lab reports among the undergraduate dental students. *Drug Invention Today*, (3):14–14.

Douglass, A. B., Douglass, J. M. 2003. Common dental emergencies. *American family physician*, 67(3):511–516.

Ferdioz, J., Brundha, M. P. 2016. Awareness of style. *International Journal of Pharmaceutical Sciences Review and Research*, unknown(1):30–32.

Hannah, R. 2019. Liquid Paraffin as a Rehydrant for Air Dried Buccal Smear. *Research Journal of Pharmacy and Technology. A & V Publications*, 12(3):1197–1200.

Harsha, L., Brundha, M. P. 2017. Prevalence of Dental Developmental Anomalies among Men and Women and its Psychological Effect in a Given Population. *Journal of Pharmaceutical Sciences and Research*, 9(6):869–869.

Huang, X. 2020. Epidemiology and Clinical Characteristics of COVID-19. *Archives of Iranian Medicine*, pages 268–271.

John, D. A., Brundha, M. P. 2016. Awareness of Vitamin A Deficiency among Middle-Aged Men-Research. *Vitamins & Minerals*, 5.

Kumar, M. D. A., Brundha, M. P. 2016. Awareness about nocturia-A questionnaire survey. *Research Journal of Pharmacy and Technology*, 9(10):1707–1707.

Mahase, E. 2020. China coronavirus: WHO declares international emergency as death toll exceeds 200. *BMJ*, 368:408–408.

Malik, Y. A. 2020. Properties of Coronavirus and SARS-CoV-2. *The Malaysian journal of pathology*, 42(1):3–11.

Merlin, A. R. S., Preejitha, V. B., Brundha, M. P. 2020. Estimation of salivary pH in hypertensive patients with and without periodontitis. *Drug Invention Today*, 14(4).

Mounika, S. 2016. Analysis of Knowledge about the Hospital Warning Symbols among the Undergraduate Dental Students-A Comparative Study. *Journal of Pharmaceutical Sciences and Research*, 8(8):856–856.

Preethikaa, S., Brundha, M. P. 2018. Awareness of diabetes mellitus among general population. *Research Journal of Pharmacy and Technology*, 11(5):1825–1825.

Ram, A. J., Preejitha, V. B., Brundha, M. P. 2020. Awareness of classes and types of autoclave among dental interns. *Drug Invention Today*, (7):14–14.

Ravichandran, H., Brundha, M. P. 2016. Awareness about personal protective equipment in hospital workers (sweepers and cleaners). *International Journal of Pharmaceutical Sciences Review and Research*, 40(1):28–29.

Shreya, S., Brundha, M. P. 2017. Alteration of Haemoglobin Value in Relation to Age, Sex and Dental Diseases-A Retrospective Correlation Study. *Research Journal of Pharmacy and Technology*, 10(5):1363–1363.

Timothy, C. N., Samyuktha, P. S., Brundha, M. P. 2019. Dental pulp Stem Cells in Regenerative Medicine – A Literature Review. *Research Journal of Pharmacy and Technology*, 12(8):4052–4052.