

How to deal and learn from the threat of COVID-19 in paediatric dentistry



S. Acharya*, B. Singh*, B. Godhi**, S. Pandey***

* Institute of Dental Sciences, SOA (Deemed to be) University, Bhubaneswar, India

** JSS Dental College and Hospital, JSS Academy of Higher Education and Research, Mysore, India

*** Government Dental College, Raipur, India

e-mail: sonu_ain@yahoo.com

DOI 10.23804/ejpd.2020.21.03.02

Abstract

COVID-19, acronym of coronavirus disease 2019, is a viral infectious disease which rapidly developed as a pandemic. The aetiologic agent of COVID-19 is SARS-CoV-2, or severe acute respiratory syndrome coronavirus 2. The 2019 coronavirus is different from SARS-CoV, but it has the same host receptor: human angiotensin-converting enzyme 2 (ACE2). SARS-CoV-2 was first discovered in 2019 in Wuhan, China, unfortunately spreading globally, resulting in the 2019–2020 pandemic, as declared by the World Health Organization (WHO). This disease started in Asia and has spread worldwide with 1,330,240 cases and 73,868 deaths at the time of writing (6th April, 2020) and many more if this disease is not contained fast. The only effective prevention methods, until a vaccine for this disease will be produced, is active testing and containment measures. This is how China, South Korea and to some extent India have been able to reduce new cases and mortality. The health care workers, especially dentists are the most vulnerable groups of people when facing this virus.

Introduction

The coronavirus is not a new virus but has been there since 1960s. The history of human coronaviruses began in 1965 when Tyrrell and Bynoe [1966] found a virus named B814. Studies were done in human embryonic cultures obtained from the respiratory tract of an adult with a common cold [Hamre and Procknow, 1966]. At least 5 new human coronaviruses have been identified since 2003, including the severe acute respiratory syndrome coronavirus, which caused significant morbidity and mortality [Almeida and Tyrrell, 1967]. Coronaviruses are a large family of zoonotic viruses that cause illness ranging from the common cold to severe respiratory diseases. The term zoonotic means that viruses can be transmitted from animals to humans. Several coronaviruses are known to be present in different animal populations that have not yet infected human beings [Tyrrell et al., 1975]. COVID-19 is the most recent virus to make the jump to cause human infection.

Signs of COVID-19 infection are similar to the common cold and include respiratory symptoms such as dry cough, fever, shortness of breath, and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and death. The COVID-19 infection is spread from one person to others via droplets produced from the respiratory system of infected people, often during coughing or sneezing [Paules et al., 2020]. According to current data, time from exposure to onset of symptoms is usually between two and 14 days, with an average of five days [Zhao et al., 2020]. Two other recent coronavirus outbreaks have been experienced. Middle East Respiratory Syndrome (MERS-CoV) of 2012 was found to transmit from Arabian camels to humans. In 2002, Severe Acute Respiratory Syndrome (SARS-CoV) was found to transmit from civet cats to humans [Guan et al., 2003]. COVID-19 has symptoms similar to those caused by coronavirus diseases of the recent past, but it is much more devastating and has already caused more deaths than all the corona diseases of the past combined. The countries worst affected are the USA, Brazil, Russia, India, Spain, China, Germany and Italy [www.worldometer.info, 2020].

COVID-19 and dentistry

Dentists have been identified as the working professionals at highest risk [Lazaro, 2020], since they work in close proximity to oral cavities of the patients. As it is known by now, COVID-19 can be transmitted through aerosols and

KEYWORDS Coronavirus, COVID-19, Dentists, Oral Health, Paediatric, Precautions.

droplets, therefore any dental treatment which produces aerosol must be performed cautiously [Ge et al., 2020]. Routine dental works, such as those employing scalers and airtors for cavity preparations, have been suspended in most countries [Ather et. al., 2020]. Only dental emergencies could be performed so as to avoid possible spread of the virus and hospitalisation as hospitals are already overburdened with COVID-19 patients [Coulthard, 2020]. During this pandemic the use of personal protective equipment (PPE) is the best option to avoid infection. There is an urgent need of emergency dental care which has to be organised with use of PPEs [Meng and Hua, 2020]. But the major concern is, if the routine dental care is suspended, this might lead to acute dental emergencies like abscess which may compromise airway and need intensive care units.

Those patients having severe pain and swellings can get their teeth extracted rather than going for pulp therapy in these times under the guidance of good oral and maxillofacial surgeons with proper follow-up [Dave et al., 2020]. This approach has to be discussed with the patients as it is a deviation from routine treatment. The patient can be followed up with the help of video calls if necessary and advised accordingly, which saves patient visits to clinic or hospitals.

The dentists should also be tested for the virus with the same high priority as other health professionals. The risk involved in dentist getting infected and transmitting the disease to others should not be underestimated. Until we have a cure for this disease the mainstay for COVID-19 is proactive and preventive measures [CPMA, 2020].

Lazaro Gamio published in New York Times on March 15, 2020 a graph showing dentists being at the highest risk from the coronavirus of all medical professionals [Gamio, 2020].

Paediatric Dentistry and COVID-19

For the child and parents

Paediatric dentistry is an age-defined speciality that provides both primary and comprehensive, preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs [www.ada.org, 2018]. This definition was given by the AAPD in 1999 and has been cited here to emphasise two keywords in the definition in these testing times created by COVID-19. The two keywords are preventive and primary. These should be our main focus now as paediatric dentists, as we cannot undertake any routine dental procedures deemed necessary for children. As children and parents cannot visit the paediatric dentists regularly they should receive advice via phone, especially video calls stating the importance of prevention in early stages of oral diseases, mostly dental caries [Ghai, 2020]. Videocalls can also demonstrate proper brushing techniques and can have story telling sessions as webinars to emphasise the importance of maintaining proper oral hygiene, brushing, flossing, and reduce consumption of sugary food. This, along with hand hygiene measure, exercises and good eating should be practiced for building immunity [WHO, 2020]. As child psychology is a part of the curriculum in paediatric dentistry, paediatric dentists can have small sessions with older patients and the new ones seeking advice as well as for lifting up their moods through discussions via video calls, chats etc.

Dentist should advise the parents to try to keep the children engaged in activities, so as not to indulge in eating snacks or munching refined carbohydrates.

For the paediatric dentist

The role of the paediatric dentist is more preventive in this scenario. The paediatric dentist needs to stress prevention, as routine treatments cannot be done in view of this pandemic. The paediatric dentist needs to keep abreast with the day-to-day developments in this pandemic and also the behaviour of the virus. They should follow the guidelines prescribed by their respective local associations and do not follow unverified sources [Peng et al., 2019]. Always try to evaluate the need for precautions and preventive measure to put in place when treating an emergency, including the proper preventive attire, both for patient and parents. There have been very few cases of children being infected with COVID-19 at the dental office, and most of the children were asymptomatic or presented with mild or moderate symptoms associated with this disease [del Rio and Malani, 2020]. The reasons might be that the innate immune response aimed at a broader group of pathogens is active in children, and also their respiratory systems might be healthier and stronger because they have been less exposed to smoke and pollution [Papap, 2020].

PPE for the treating dentist is mandatory. The paediatric dentist also has to be aware of his/her dental settings as many surfaces can become contaminated like spittoon, chair handles, chair light. These too have to be cleaned properly with recommended solutions for SARS-Cov-2 [Li et al., 2020]. Standard precautions should always be followed. i.e. face masks, preferably N95, eye protection with side shields, long complete gowns covering hands and legs.

There is a personal responsibility in controlling the spread of the disease, meaning taking into account your risk, patients at risk and the risk for family members. In case medications for emergency conditions are prescribed, a thorough history must be collected and prescription can be transmitted electronically (for example via phone Apps). The paediatric dentist, as a responsible citizen, should also follow the directions given by the government and stay informed and updated on the guidelines to reduce cross-infection. Until a cure is found for this deadly virus COVID-19, the best approach is prevention and containment [Stevens, 2020].

Protocols to be followed

Paediatric dentists

- 1 Proper screening of all patients, even if asymptomatic.
- 2 Consider all paediatric patients (mostly asymptomatic) and parents as carriers of the virus [Lu et al., 2020].
- 3 Consider the patients who have recovered recently as potential carriers of the virus for 30 days.
- 4 Identifying the urgency of the treatment needed, especially for child patient as they are more vulnerable to the virus and consider preventive and minimally invasive treatment.
- 5 Categorically classify all procedures according to the urgency of treatment and weighing the risk-benefit ratio.
- 6 Urgent cases like severe unbearable pain due to pulpal involvement that needs pulp therapy and extraction should be performed with proper care of the child and parent including airborne precautions with PPEs for every case.
- 7 The paediatric dentist should try to reduce stress in parents and children and create a relaxed and anxiety-free environment.
- 8 Always follow local, national and global guidelines when treating patients.

Paediatric dental patient

- 1 Parents should be able to evaluate the urgency of treatment needed for the child with the help of the paediatric dentist.
- 2 Parents should always seek advice of the paediatric dentist through telephone first and if the case is not urgent they should not visit the clinic.
- 3 The parents and the child should follow all the instructions given by the paediatric dental clinic in case of emergency, prior to the visit to the clinic.
- 4 The parents should prepare the child mentally before the visit as the clinic environment has changed in these times, with paediatric dentists and assistants behind their PPEs which may scare the child.
- 5 The parents and the child should follow all the instructions given by the paediatric dentist after treatment and maintain proper oral hygiene of the child.

Emergency [Alharbi, Alharbi and Alqaidi, 2020]

- 1 Tele-screening of patients is required, collecting information about symptoms of COVID-19 and recent travel history to and from epicentres of COVID-19.
- 2 Only emergency management of life threatening/severe pain conditions not subsiding with medications.
- 3 In case paediatric dental professionals must offer treatment on a face-to-face basis, they should follow all precautions that have been put in place to reduce the risk of cross-infection during treatment and evidence comprehensive risk assessment completion.

Future considerations

Dentistry in general and paediatric dentistry will not be the same again after COVID-19 pandemic. Some of the things we can think of for the future are the following.

- 1 A thorough medical and dental history, including travel history and treatment provided, if any, in other clinic, and in same country or another country.
- 2 Strict and even more stringent sterilisation protocols to be followed.
- 3 Standard safety protocols for the dentist and the patients; i.e. complete coverage aprons, gloves, face masks with side shields, PPEs if possible depending on local/national guidelines.
- 4 Treatments producing aerosols should be performed with proper ventilation and without air conditioning, if possible.
- 5 In case of children, parents should not be allowed in the operator room if the child can be managed and is cooperative.
- 6 Less appointments during the day and spaced in time so that the clinic can be completely sterilised/fumigated after each patient.
- 7 Report to local authorities if patient complains of any symptoms of COVID-19 disease.
- 8 Sensitisation of children about the changed environment of dental clinics.

Conclusion

The epidemic that started in 2019 in Wuhan, China, has taken over as a pandemic with more than 2,600,000 people affected and 366,418 deaths worldwide. The interventions

which can ultimately control this outbreak are still not clear because there is currently no vaccine available, and the effectiveness of antivirals and antimalarial drugs has not been proven yet. However, basic public health measures such as staying home (i.e., self-quarantine), frequent hand washing, wearing a face mask, and respiratory etiquette including covering the mouth and nose while sneezing and coughing would be effective as was seen in controlling SARS. As with any new outbreak, frontline clinicians and public health authorities must work as a team to educate the public by providing accurate and up-to-date information and by taking care of patients with respiratory illness in a timely and effective manner so as to reduce mortality as much as possible.

References

- Alharbi A, Alharbi S, Alqaidi S. Guidelines for dental care provision during the COVID-19 pandemic. *Saudi Dent J* 2020 Apr 7;32(4):181–6.
- Almeida JD, Tyrrell DA. The morphology of three previously uncharacterized human respiratory viruses that grow in organ culture. *J Gen Virol* 1967;1:175–178.
- American Dental Association Commission on Dental Accreditation. Accreditation standards for advanced specialty education programs in pediatric dentistry. Chicago, Ill.; 2018. Available at: "https://www.ada.org/~media/CODA/Files/ped.pdf?la=en
- Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus Disease 19 (COVID-19): implications for clinical dental care. *J Endod* 2020;46(5): 584–595.
- Coulthard P. The oral surgery response to coronavirus disease (COVID-19). *Keep calm and carry on? Oral Surg* 2020; (published online March 20).
- Dave M, Seoudi N, Couthard P. Urgent dental care for patients during COVID-19 pandemic. *Lancet* 2020 Apr 18;395(10232):1257.
- del Rio C, Malani PN. 2019 Novel Coronavirus—Important Information for Clinicians. *JAMA* 2020;323(11):1039–1040.
- Gamio L. The workers who face the greatest coronavirus risk. *New York Times*. 15 March 2020. <https://www.nytimes.com/interactive/2020/03/15/business/economy/coronavirus-worker-risk.html>
- Ge Z, Yang L, Xia J. et al. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *J Zhejiang Univ Sci B* 2020; 21: 361–368.
- Ghai S. Teledentistry during COVID-19 pandemic [published online ahead of print, 2020 Jun 16]. *Diabetes Metab Syndr* 2020;14(5):933-935.
- Guan Y, Zheng BJ, He YQ, et al. Isolation and characterization of viruses related to the SARS coronavirus from animals in southern China. *Science* 2003;302:276–278.
- Hamre D, Procknow JJ. A new virus isolated from the human respiratory tract. *Proc Soc Exp Biol Med* 1966;121:190–193.
- Li R, Pei S, Chen B, Song Y, Zhang T, Yang W, Shaman J. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science* 2020 May 1;368(6490):489-493.
- Lu X, Zhang L, Du H, et al. SARS-CoV-2 infection in children. *N Engl J Med* 2020 Apr 23;382(17):1663-1665.
- Meng L, Hua F. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. *J Dent Res* 2020;1222034520914246.
- Pappas S. Why are children missing from corona virus outbreak cases? *Live Science*. Feb 2020. Assessed on 8th April from <https://www.livescience.com/why-kids-missing-coronavirus-cases.html>
- Paules CI, Marston HD, Fauci AS. Coronavirus infections—more than just the common cold. *JAMA* 2020 Jan 23. doi: 10.1001/jama.2020.0757. Online ahead of print.
- Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci* 2020 Mar 3;12(1):9.
- Stevens H. Why Outbreaks like Coronavirus Spread Exponentially, and How to "Flatten the Curve". Available online: on https://www.washingtonpost.com/graphics/2020/world/corona-simulator/?hpid=hp_hp-top-table-main_virus-simulator_520pm%3Ahomepage%2Fstory-ans. Assessed on 8th April 2020.
- The Chinese Preventive Medicine Association. An update on the epidemiological characteristics of novel coronavirus pneumonia (COVID-19). *Chin J Epidemiol* 2020; 41(2):139–144.
- Tyrrell DA, Almeida JD, Cunningham CH, et al. Coronaviridae. *Intervirology*. 1975;5:76–82.
- Tyrrell DA, Bynoe ML. Cultivation of viruses from a high proportion of patients with colds. *Lancet* 1966;1:76–77.
- World Health Organization. Questions and answers on coronaviruses. 2020c. [accessed 2020 Feb 26]. <https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>.
- www.worldometer.info. Accessed 8th April 2020 for aepidemiological data.
- Zhou P, Yang XL, Wang XG, et al. Discovery of a novel coronavirus associated with the recent pneumonia outbreak in humans and its potential bat origin. Preprint. <https://www.biorxiv.org/content/10.1101/2020.01.22.914952v2.full.pdf>