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Review Article

Impact of Covid-19 on Pediatric Dentistry: Overview and Suggestions

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Abstract

The global pandemic Corona virus disease 2019 (COVID-19) is an infectious viral disease caused by SARS-CoV-2. It has gravely affected the health care system. Dentistry like any other healthcare profession has also suffered to a great extent during the pandemic and pediatric dentistry is no exception. It has impacted the oral health of children in a miserable way as their dental needs went unaddressed for a long time. Children and adolescents of age less than 18 years have not received the vaccination against COVID-19 which makes them more vulnerable to the predicted third wave of the disease. This article presents an overview concerning the impact of the COVID-19 pandemic on pediatric dentistry and at the same time familiarizes the pediatric dental professionals and clinicians working on the child patients with the threat of COVID-19 while suggesting the standard protocols and clinical recommendations for the efficient and effective management of pediatric patients in a dental office.

Keywords: *Coronavirus Disease (COVID-19); Pandemic; Pediatric Dentistry; Oral Health; Protocols*

Introduction

Coronavirus disease 2019 (COVID -19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an infectious viral disease. The outbreak took place in Wuhan, China, and soon the disease transformed into a public health emergency. WHO declared COVID -19 as the first pandemic caused by the coronavirus on 11 March 2020 [1]. Prior to the COVID-19 pandemic, the 21st century has twice witnessed the global spread of coronaviruses- SARS coronavirus (SARS-CoV- 2) in November 2002 and June 2012 as Middle East respiratory syndrome coronavirus (MERS-CoV) [2,3].

SARS-CoV-2 is a single-stranded RNA virus belonging to Coronaviridae family. After SARS-CoV-2 and MERS-CoV, it is the third known zoonotic virus to infect humans [4]. The entry of SARS-CoV-2 in humans is mediated by the angiotensin-converting enzyme-2 (ACE 2) receptors, widely present in lungs, heart, kidney, brain, and almost all organs [5]. The mode of transmission includes- physical Contact, droplet spread, airborne, fomite, feco-oral route, bloodborne, mother to child, and animal to human transmission [6].

The usual initial symptoms include loss of taste and smell followed by fever, cough, fatigue, diarrhea, rashes leading to the development of serious complications like pneumonia, shortness of breath, and loss of speech, movement. In children, COVID-19 may develop and they can show mild symptoms making them the potential carriers of COVID-19. Whereas some may develop serious complications called Multisystem Inflammatory Syndrome in Children (MIS-C). The condition can cause inflammation of the heart, lungs, kidneys, brain, GIT, eyes, and skin [7].

With all the aspects of life getting impacted by COVID-19, dentistry is not spared as well. Besides general dentistry, pediatric dentistry is of important concern. Since the young adult, adult, and old age population have been vaccinated, children are at potentially high risk of getting infected. Only Pfizer vaccine is authorized for administration to kids age 12 and above [8]. It still leaves a wide range of pediatric population ranging from age group 0 - 18 consists of 472,111,477 people that is 33.899% of total Indian population exposed to the unpredicted danger from the third wave of COVID [9]. This may lead to the surge in cases of cross-infection between dental health care personnel and pediatric patients in the anticipated third wave of COVID.

The lockdown imposed during the pandemic worsened the oral health scenario in children. The missed regular checkups lead to further worsening of the cases. Therefore, we need to follow standard protocols and implement the best strategies to deal with non-emergency and urgent dental procedures while taking measures to prevent cross-infection.

In this review, we will be discussing the protocols and suggesting some strategies to manage emergency and non-emergency procedures in child patients.

Risks associated with pediatric dental treatment during COVID-19

As dental professionals, we are speculated to come in direct contact with the patient's saliva and blood which makes us vulnerable to the COVID-19 infection. Saliva plays the role of reservoir for the virus while the droplets play a significant role in the transmission of the disease [10]. These droplets can keep suspended in the environment for a longer period of time and get acquired by the host through the eyes, nose, and mouth to the lung [11].

The aerosol generation by using ultrasonic scalers, airrotars, the three-way syringes can significantly increase the viral load in a dental operatory [12]. Since aerosols are small in size (< 5 μm) they are more likely to be deeply inhaled into the lungs while the droplets (> 5 μm) are susceptible to infect the upper airway [13]. Therefore, the Aerosol Generating Procedures (AGP) exposes the dentist, office staff, and other patients at the risk of getting infected.

The major issue with the pediatric population is to make them follow the personal hygiene methods properly that eventually makes them propagators of the disease [14]. Also, children need to be made familiar with the new protocols including the use of PPE to make their visit a pleasant experience.

Dental clinic protocols to prevent COVID-19 transmission

The implementation of efficient protocols to prevent cross-infection is of the highest concern in the current pandemic scenario. Here are some step-wise protocols that can be followed to control infection and manage patients with dental healthcare needs.

Screening of the patients

The patient screening can be done over telephone calls known as teledentistry. The proper history of the patient should be recorded by the oral health care provider with details including history and any prevailing symptoms of COVID-19 infection [15].

Based on the recorded telephonic information, the patients should be prioritized according to the urgency of dental care requirements (triage). The procedures can be classified as an emergency and elective dental procedures. According to ADA emergency procedures includes- the presence of swelling, severe pain due to pulpitis, traumatic dental injuries, uncontrolled bleeding, dry socket, and pericoronitis. Whereas the non-emergency procedures include- esthetic dental procedures, restorative treatment for the asymptomatic carious teeth, extraction of asymptomatic teeth, and routine dental scaling [16].

In-office management of the patients

The patients should be allocated appointments prior to their visit. This will prevent the surge of patients in the clinic and ensure effective implementation of social distancing. The patients should be checked for temperature, any symptoms of COVID-19, and possibly perform Rapid Antigen Test when patient visits clinic [17].

The dental health professional should follow standard measures of infection control including proper donning and doffing of PPE, wear an N95 mask, use autoclaved instruments, sanitize the dental chair after every patient, minimize aerosols generation. Schedule the appoints with high aerosols generation risks at the end of the day and perform them in a negative pressure room to contain the infection.

The follow-up can be done through telephonic consultation or video consultation.

Patient with suspected or confirmed SARS-CoV-2 infection

Defer non-emergency dental treatment. For emergency dental procedures the Dental Heal Care Provider (DHCP) is recommended to follow CDC's Interim Infection Prevention and Control Recommendation for Healthcare Personnel in the pandemic [18]. It includes the following:

- The HCP should wear an N95 mask or equivalent or higher-level respirator, eye protection, gloves, and a gown.
- The HCP members present should be limited to only those deemed essential for patient care. Visitors should not be present for the procedure.
- Whenever possible, AGPs should take place in an AIIR (Airborne Infection Isolation Rooms/Negative Pressure rooms).

Suggestions

A dental setting is considered to be at elevated risk of cross-infection between the child patients and the dental practitioners [19,20]. Therefore, it becomes mandatory to take all the necessary measures to ensure patient safety and affordable dental care during this COVID-19 pandemic. Given below are some suggestions which must be taken into consideration during this pandemic in a dental operatory:

1. All dental practitioners should take it as a responsibility to keep themselves updated with current guidelines and recommendations for child patients as they are changing quickly [20].
2. We should try to encourage non-aerosol generating procedures as much as possible in the dental settings. Minimally invasive procedures [12] and Atraumatic Restorative Treatment [21,22] should be given priority.
3. Silver Diamine Fluoride (SDF) application has proved to be beneficial to arrest active dental caries. SDF is a colorless solution that has a ph of 10 which can be applied on the tooth surface with the help of a small application without the need for complicated instruments [23].
4. According to the recommendations from the Royal College of Surgeons of England, dental trauma in permanent dentition such as avulsion, severe luxation, crown root fracture or complicated crown fracture with involvement of pulp should be managed as soon as possible [23].
5. Pre-visit preparation should be done for every child patient [24].

6. Patient should be informed about their appointment, screening and in-office protocols during the dental office preparation [24].
7. The dental practitioners should talk on the phone call with the parents of child to obtain all the possible information both on child's oral health status [24].
8. Telemedicine services should be used appropriately to give instructions regarding oral health and medication [25].
9. Aggressive screening of the patients attendants, dental staff, dental practitioners should be should be done before the dental procedure [24].
10. Child patient's temperature should be checked with the contact-free forehead thermometer.
11. Child patient's SpO_2 should be checked with fingertip pulse oximeter before entering the dental operatory.
12. A negative pressure or airborne infection isolation room should be there for the treatment of any patient suspected of COVID-19 to minimize the exposure between the patient and staff [24].
13. For hand hygiene use of 80% ethanol or 75% 2-propanol has been found to be effective against the SARS-CoV-2, so they must be encouraged and hands must be washed whenever visibly soiled [24].
14. PPE kit should be used for the aerosol generating procedures. Doffing of the PPE kit should be done as per the local biomedical waste protocols [24].
15. Patients who were previously suffering from COVID-19 who have completed their home isolation should receive emergency dental treatment after fulfilling the latest CDC guidelines [24].
16. At the same the dental staff members should check their body temperature before work.
17. Pre-procedural mouth rinse with betadine or with any oxidative agents in order to reduce the viral load [24].
18. Rapid antigen or RT-PCR test should be recommended before treatment to reduce the chances of spread of infection.
19. Before starting the treatment all the instruments should be kept in a separate tray to avoid environmental contamination.
20. All the surfaces need to be disinfected after every dental procedure. A time lapse between the dental appointments should be encouraged to perform thorough decontamination [24].
21. Sincere attempts should be made to provide children with dress similar to office staff members to reduce fear.
22. The dental operatory should be equipped with good ventilation system.
23. Social distancing norms should be followed in the reception and waiting room area.

Conclusion

Dental healthcare professionals need to use the best possible strategies to overcome the challenges posed by COVID-19 pandemic. Dental practitioners working on child patients should be aware of the latest guidelines and protocols with regards to paediatric dentistry. Telemedicine services including instructions for oral health and medication could be beneficial for children in need for dental treatment. In the present scenario it is essential that priority should be given to the dental emergencies and urgency procedures until the outbreak

goes into recession. Since the aerosol generating procedures elevates the risk of airborne transmission of COVID-19 infection, they should be avoided. Standard guidelines for dental care provision for child patients should be formulated and implemented with immediate effect worldwide during the global pandemic to minimize the risk of exposure and augment patient safety.

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