

COVID-19: Practice Recommendation for Pediatric Dentist

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ABSTRACT

Introduction: In the current scenario where COVID-19 pandemic is globally prevalent, adequate management of the oral health of children becomes of critical importance, by employing specific protocols relating both to the lesions of the oral cavity which normally does not represent an emergency and to those clinical circumstances that fall within the category of pediatric dental emergencies.

Materials& Methods: Literature search was conducted in all databases for information regarding COVID-19 scenario practice management, and the information was summarized to outline the Guidelines for practice management of paediatric patients in dental clinic amidst and after the COVID-19 pandemic.

Results: As per the search conducted on literature found on COVID-19, the main objective is to limit the spread of the pandemic and the onset of cross-infections. Therefore, not only is rigorous and highly effective infection control protocols needed in the dental environments, but it is also essential to work on parental communication and education aimed at maintaining the oral health of children.

Conclusion: This article draws a basic outline of the procedures to be followed in the management of paediatric patients in the dental setting. More research is needed on a number of questions related to the management of COVID 19 in dental setting.

Key words: 2019 novel coronavirus; acute respiratory disease; transmission, dental emergency, pediatric dentistry

1. INTRODUCTION

Starting from December 2019, the prevalence of novel virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2) has caused Coronavirus Disease (COVID-19) which has become a major public health event nationwide and even globally. The emergence of Covid-19 has become one of the most significant challenges to the healthcare profession. The epidemics of coronavirus disease 2019 (COVID19) had started from Wuhan, China, last December and has spread to many countries around the world. [1]

Prevention of oral health problems in children characterizes the commitment towards which health professionals specialized in pediatric dentistry should always be oriented, especially in times of health emergencies such as the one we are going through today, in which the WHO first declared the COVID-19 epidemic a Public Health Emergency of International Concern [1] and then later recognized it as a pandemic. [2]

2. COVID-19

2.1 Etiology and clinical manifestation of COVID-19

According to recent research, it is similar to SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV). SARSCoV-2 is zoonotic, with Chinese horseshoe bats (*Rhinolophus sinicus*) being the most probable origin and pangolins as the most likely intermediate host. [3] Majority of the patients experienced fever and dry cough, while some also had

shortness of breath, fatigue, and other atypical symptoms, such as muscle pain, confusion, headache, sore throat, diarrhea, and vomiting. [4] Intubation period of COVID-19 is 7-14 days in majority of the population. [5] Among patients who underwent chest computed tomography (CT), most showed bilateral pneumonia, with ground-glass opacity and bilateral patchy shadows being the most common patterns. [5] Among hospitalized patients in Wuhan, around one-fourth to one-third developed serious complications, such as acute respiratory distress syndrome, arrhythmia, and shock, and were therefore transferred to the intensive care unit. [6,7] In general, older age and the existence of underlying comorbidities (e.g., diabetes, hypertension, and cardiovascular disease) were associated with poorer prognosis. [7-9]

2.2 Mode of transmission and Risk factors in dental setting

Research reports states that the COVID-19 pandemic started with a single transmission from animal to man, followed by an important human-to-human transmission. [3,10] The human-to-human transmission of COVID-19 occurs mainly through respiratory droplets in air suspension and aerosol and through direct or indirect contact. [11,12] Mother-infant vertical transmission has not yet been confirmed. [13,14] Dental personnel are repeatedly exposed, due to the close contact with patients, frequent use of sharp devices and performing standard dental procedures that include the use of rotating instruments such as the high-speed turbine handpiece and the use of scalers for oral hygiene which are associated with the generation of large quantities of aerosols and droplets from the saliva and blood of the patient.

3. Practice management of paediatric patients

3.1 Risk factors associated with paediatric patients

The risk factors that are commonly encountered while diagnosing and treating paediatric patients are: [15]

1. Respiratory droplet transmission - coughing, sneezing, etc. by children can spread droplets between doctors, nurses and patients at the same time.
2. Indirect contact transmission: A variety of instruments and articles are involved in the oral diagnosis and treatment environment. If the contaminated droplets are deposited on the surface of the article, infection may occur when the doctor, patient, and nurse come in direct contact with the surface of the contaminated article.
3. Aerosol transmission: This is a special transmission method during oral diagnosis and treatment. During the dental procedure, the use of high-speed turbine handpiece, ultrasonic dental scaler and three-purpose spray syringe may produce a mixture of body fluids such as saliva, blood, droplets and aerosols which will increase the risk of transmission.
4. Paediatric patients present additional risk of transmission: the use of removable orthodontic appliances or auxiliary elements in fixed orthodontic therapies, such as the use of intermaxillary elastic bands, entails risk of contamination if handling is not carried out with due precautions.
5. Due to the peculiarity of the child patient, there are some other risks of transmission: the paediatric patients cannot don personal protective equipment as required, while on the way to the hospital or during the visit, especially the younger patients. When the patient sees the paediatric dentist in PPE, they mostly do not cooperate with the treatment procedure. Children are often accompanied by more than one person at the time of treatment.

3.2 Management of dental treatment that do not represent an emergency

Due to COVID-19 pandemic, together with all other medical activities, routine dental work was suspended and postponed in relation to the progress of the pandemic situation, with the recommendation of limiting dental

interventions to emergencies only¹⁶. Henceforth, the necessity to follow the oral health status of children is only through remote interaction with parents, who must be properly trained about diseases which do not present an emergency and can be managed with palliative measures.

3.3 Management of dental emergency

Many pediatric dental emergencies require immediate treatment even during the COVID-19 outbreak. Dental emergencies in children are acute pulpitis, acute apical periodontitis, dental abscess, dental trauma and maxillofacial trauma.^[16] The management of all pediatric dental emergencies during the pandemic must take place by adopting protective measures for healthcare personnel and for the young patients in accordance with the recommendations and guidelines related to the use of effective protocols for the prevention and control of infections, as referred to by the scientific literature.^[17-21]

3.3.1 Screening and travel history

This phase is very important and it is necessary to make a recording of the temperature of both the child and their caregivers and to carry out a detailed evaluation to investigate if they travelled to geographic areas affected by COVID-19 within 14 days preceding the dental visit, with special emphasis if there is a history of contact with COVID-19 patients or suspected individuals.^[12] The child should be accompanied by a minimal number of people. In addition to measuring the temperature, medical protective masks should be provided to patients and their caregivers.

3.3.2 Hand hygiene

The reinforcement of good hand hygiene practises of the reception staff, of the patient, and of the dental staff is of fundamental importance especially in the period of transmission of COVID-19.

3.3.3 Personal protective measures for the pediatric dentist

Personal protective equipment (PPE) that are recommended for the pediatric dentist and other healthcare professionals include:

- Face Shields.
- Gloves.
- Goggles and Glasses.
- Gowns.
- Head Covers.
- Masks.
- Respirators – N-95.
- Shoe Covers.

Tertiary or enhanced protection is needed when coming into contact with suspected or confirmed patients with COVID-19 infection, although a patient with suspected or confirmed infection with COVID-19 should not be treated. In the unlikely event if that happens and the paediatric dentist cannot avoid close contact, special protective clothing is required. Negative-pressure treatment rooms/airborne infection isolation rooms (AIIRs) should be used to treat patients with suspected or confirmed COVID-19 infection and should not be treated in a routine dental practice setting. Therefore, anticipatory knowledge of health care centres with provision for AIIRs would help dentists to provide emergent dental care if the need arises.^[22]

3.3.4 Patient examination

A Research^[23] recommends the "two before and three after" technique as a standard hand hygiene procedure, emphasizing that oral professionals should wash their hands before examining the patient, before dental procedures, after direct contact with the patient, after touching the environment without prior disinfection, and after touching the patient's oral mucosa and skin or coming into contact with saliva and oral fluids.

Mouth wash rinses - Recent studies^[24] indicate that chlorhexidine, the most commonly used mouthwash in dental studies, is not effective against the SARS-CoV-2 virus. On the other hand, the virus appears to be vulnerable to oxidation: it is therefore possible to let the child rinse with

dedicated antiseptic solutions to reduce the oral bacterial load.

3.3.5 Recommendations for treatment

- Only the patient should be admitted in the operating room.
- Use four-handed dentistry techniques.
- Use a high-volume aspirator to minimize droplets and aerosol during high-speed turbine operation.
- It is recommended that all the treatment to be carried out under rubber dam isolation in order to minimize the production of aerosols contaminated with blood and saliva, especially during the treatment of the pulpits.
- The use of high-speed turbines with anti-retraction valve, which significantly reduces the return flow of oral bacteria.

3.3.6 Management of traumatic dental injuries

Traumatic pathology has a high prevalence in children. Therefore, it is likely that it can present itself as an emergency to be managed during the COVID-19.

If the patient presents with avulsed tooth: The condition associated with a favorable prognosis is represented by the immediate reimplantation of an avulsed permanent tooth.

In case of dislocation, the emergency treatment consists of repositioning and splinting with the adjacent dental elements.

The proper planning of the treatment of dental fractures, dislocation or dental avulsion depends on the age, the traumatic severity of the dental tissue, the development of the apex and the duration of the dental avulsion. [25-27]

If the patient presents with contusion of the soft tissues of the face: Debridement with removal of torn and contaminated tissues, disinfection and suturing is done if it is necessary. Patients with maxillofacial lesions require instead immediate hospitalization.

4. Disinfection of the dental operatory

Due to the minimal information available on 2019-nCoV, comparatively similar genetic features between 2019-nCoV

and SARS-CoV indicate that the novel coronavirus can be vulnerable to disinfectants such as sodium hypochlorite (1000 ppm or 0.1% for surfaces and 10,000 ppm or 1% for blood spills), 0.5% hydrogen peroxide, 62–71% ethanol, and phenolic and quaternary ammonium compounds if utilized in agreement with the manufacturer's instructions. Studies illustrate that other biocidal agents such as 0.05–0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate probably have lesser efficiency. In addition to the type of disinfectant, consideration to other factors such as the duration of use, dilution rate, and especially the expiration time following the preparation of the solution according to the manufacturer's instructions is also crucial. [28]

5. Management of medical waste

Dental operatory waste should be routinely transported to the institution's temporary storage facility. Reusable tools and equipment must be appropriately pre-treated, cleaned, sterilized, and properly stored until the next use. Dental waste resultant from the treatment of suspected or confirmed 2019-nCoV patients is considered medically infectious waste, that must be strictly disposed of in accordance with the official instructions using double-layer yellow medical waste package bags and "gooseneck" ligation. [28]

6. General recommendations

After any type of treatment, it is necessary to proceed to an adequate disinfection of the environment followed by sealing of the disinfected area for next clinical use.

7. CONCLUSION

Children's oral health is a prerequisite and guarantee for their overall health. Appropriate oral health management, disease prevention and treatment for children during the COVID-19 global pandemic are critical to their oral and general health. According to the present scenario, it's mandatory to consider difficulties in context to contagion contamination. During times like COVID-

19, proper education of parents in regards to the general preventive measures for oral health, and management of milder oral pathologies for which direct involvement of the specialist in paediatric dentistry is not necessary or can be postponed, is essential. On the contrary, in case of dental emergencies, immediate treatment is required. Adherence to strict protection protocols of the subjects involved and dental operatory disinfection becomes vital in order to minimize the risk of cross infection.

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