

Management of Paediatric Dentistry Patients During COVID - 19 Pandemic

Bankole OO, Popoola BO

Department of Child Oral Health, University of Ibadan, Ibadan, Nigeria

Correspondence: Bankole OO

E-mail: bumbank2002@yahoo.com

Abstract

Objective: The aim of the publication is to provide a brief overview of the etiology, incubation, symptoms, and transmission paradigms of this novel infection and how to minimize the nosocomial spread in the dental healthcare setting.

Methodology: Electronic search was performed in Pub Med and Google Scholar using the keywords; COVID-19, pandemic, paediatric dental care and management.

Result: Transmission of COVID-19 in paediatric dental patients is peculiar in that young children cannot tolerate face masks and the presence of accompanying parents / guardians increase the potential risk of infection in the paediatric dental clinics. It is therefore important that adequate screening of child patients and guardians and parents should be done.

Conclusion: Although there is a lot of information about the COVID - 19 pandemic, reliable resources should be compiled for the dental team, parents and children in form of social stories, poems and infographics to prepare them for emergency treatment.

Keywords: COVID-19, Management, Paediatric, Patients, Epidemic

Introduction

The Corona virus, also known as Severe Acute Respiratory Syndrome Corona virus 2 (SARS -CoV-2) was detected in Wuhan, China in December 2019¹. This virus was named COVID - 19 by the World Health Organization and has become a major national and global public health concern as the number of affected countries had risen to 216^{2,3}. Overall, 16,708,920 cases of COVID-19 have been reported since 31 December 2019 and 29 July 2020, including 660,123 deaths⁴. In Africa there were 873,331 cases as recorded on 29 July 2020. South Africa (459,761), Egypt (92,947), Nigeria (41,804), Ghana (34,406) and Algeria (27,973) were among the five countries most were reported⁴.

Since the outbreak of this pandemic, dental practices have been affected globally and due to the pattern of community spread, there is a continuing wildfire-like effect in many developing countries in Africa, especially Nigeria and South Africa⁵. Therefore, despite a wide range of measures to curb the spread of this pandemic, paediatric dental specialists are

likely to encounter an increasing number of patients with suspected or confirmed COVID-19, and will need to maintain strict infection prevention and control to avoid nosocomial spread.

Given the obvious notion that COVID-19 is likely to pose a threat to patient care, it is appropriate for dentists to have a good understanding of the different aspects of the disease and various approaches to the management of dental problems in coronavirus-infected paediatric cases. This review thus provides an overview of COVID-19 infection, management approaches and information to help with treatment plans, before patient visits, during and post-treatment.

Epidemiology of COVID - 19 in children.

Children of all ages are susceptible to COVID-19 infection and this could be through person-to-person transmission because of their likely exposure to family members and / or other children with COVID-19 infection⁶. Vertical transmission between mother and child has not yet been ascertained⁷. A Chinese

survey revealed that, among 1391 children tested, 171 (12.3%) of them tested positive for SARS-CoV-2⁸. Similarly, the Centre for Disease Control and Prevention (CDC) reported 2572 confirmed cases of COVID-19 in individuals younger than 18 years in the USA as at April, 2020 which was 1.7% of the total number of recorded cases⁹. Studies among children have also reported that children unlike adults are less likely to be symptomatic or develop severe symptoms, these children were referred to as asymptomatic carriers with a potential to transmit the infection to others^{6,10}. There is a possibility however that the true rate of COVID-19 infection in the paediatric population may be underestimated. The reason being that many of them may not likely be tested because they may be asymptomatic or present with mild or moderate symptoms. The asymptomatic or mild/moderate symptoms reported in children was explained by the fact that children have a more active innate immune response and healthier respiratory tracts which have not been exposed to as much pollutants as adults¹¹. Similarly, it is also believed that children possess a weaker ability to cause an acute inflammatory response to SARS-CoV-2¹².

Risk of Dentists and oral health workers.

The transmission of COVID-19 virus has been reported to occur mainly through respiratory droplets in air suspension, aerosol and through direct or indirect contact with contaminated surfaces^{13,14}. Due to the peculiarity of the mode of transmission of this virus, dentists and other oral health workers have been regarded as high risk category of health workers because of their close contact with the patients' mouth and nose during dental procedures. Dental clinics, oral fluids from the patient, contaminated dental instruments and dental clinic environmental surfaces are potential routes of contracting COVID-19¹⁵. Most dental procedures involve the use of rotating instruments such as high speed drills, ultrasonic scalers and air/water sprays which are capable of generating a lot of aerosols and droplets from the oral fluids of the patient. Such aerosols are capable of being suspended in the air for a considerable period before they finally settle down on the dental clinic environmental surfaces. Such surfaces become the potential risk of cross infection for the dentist, other oral health workers and other patients¹⁶. According to van Doremalen et al¹⁷, SARS-CoV-2 virus can persist on surfaces for up to 72 hours.

Additional risk of transmission of this infection has been linked to paediatric dental setting¹⁸. The fact that young children cannot tolerate /use face mask

and presence of parent/ guardians, with whom the paediatric dentist must unavoidably interact with, increase the potential risk of infection in the paediatric dental clinics. According to Huang et al.¹⁹ because of the long incubation period of (2-14 days) of this infection and since children may be asymptomatic or present with mild symptoms, all child patients and parents ought to be considered as potential carriers of SARS CoV-2 unless proved otherwise.

During this period of SARS CoV-2 pandemic, it is important that appropriate management protocols should be developed to prevent cross infection and spread of COVID 19 virus among the oral health workers, their patients and the whole populace.

Management of paediatric dental patient protocol

The general recommendation for dentists in this period of pandemic is that all non-emergency dental treatments should be suspended, so as to minimize risk of cross infection to patients, oral health workers and the public^{20,21}. Dentists and parents are advised to have dental consultations through phone calls to obtain information on the child health status and oral symptoms (Virtual-dentistry/Teledentistry). Virtual-dentistry at this period will help to limit the number of patients visiting the dental clinic. Oral health counseling to parents via phone calls, use of prescribed antibiotics or and analgesics should be employed for non-emergency cases where appropriate. Also, it is important to emphasize the need for parents/guardians to keep up healthy oral health practices and habits at this time until their children can be seen in the clinic. Oral health practices such as twice daily brushing with fluoridated toothpaste, maintaining healthy eating habit by limiting cariogenic diet to meal time and drinking of water instead of carbonated drinks must be emphasized to the parent. However, if they notice any oral condition that needs an expert opinion, they should put a call through to their dentist.

Non-emergency oral conditions that can be managed at home by parents through virtual dentistry.

- Dislodged temporary dressings in the cavity of deciduous or permanent carious teeth with temporary dressings: Cavity should be kept free from food debris by carefully brushing after meals to prevent the onset of painful symptoms. Also, food of extreme temperatures should be avoided, so as not to trigger pain²².

- Chronic apical periodontitis with pain on mastication: Antibiotics and pain relievers should be prescribed to control and alleviate symptoms.
- For painful exfoliating deciduous teeth, parents should be advised to encourage the child to chew hard foods such as fruit which can mechanically induce tooth removal from the alveolar support²¹
- Pericoronitis of permanent first molar: Prescription of antibiotics, pain reliever and warm saline mouth wash to remove food debris in the gingival pockets between the tooth and the surrounding gum will be helpful²².
- Children with malocclusion such as increased overjet, incompetent lips: This can predispose them to dental trauma. Standard mouth-guards should be recommended to reduce the risk of traumatic tooth fractures. Also, parents should be advised to guide and guard their wards when playing at the period of lock down to prevent traumatic dental injuries. Indoor games should be encouraged rather than contact sports.

Emergency oral health conditions that need dental clinic visit.

Dental conditions in children that need prompt paediatric dental intervention in this period include:

- Life-threatening emergencies such as airway obstruction due to facial swelling, intraoral or extra oral infections.
- Severe toothache caused by pulpal inflammation.
- Traumatic dental injuries.
- Acute and painful lesions/ulcerations of the oral mucosa.
- Oro-dental conditions that are likely to exacerbate systemic medical conditions.
- Dental conditions that have resulted in acute and severe systemic illness.
- Suspected oral cancers.
- Children with oral and maxillofacial trauma²³

Although this list is not exhaustive, other oral conditions that may exacerbate or complicate a child's dental condition should also be taken into consideration when justifying the need for urgent dental care. Children with underlying medical conditions which may predispose them to risk of complications from any oral infection and those with special health care needs should also be put

into consideration²⁴. However, aerosol generating procedures (AGP) should only be undertaken to provide urgent care where no other reasonable option is available.

Elective dental treatment of paediatric patient under general anaesthesia should be suspended at this time except in emergency situation²⁴ such as

- Traumatic dental injuries where treatment under local anaesthesia or sedation is not possible.
- Children with acute dental infection that is not responsive to antibiotics.
- Children with intractable pain or discomfort which cannot be managed under local anaesthesia.
- Children with facial swelling because of oral infection and treatment under local anaesthesia is not possible.
- Children whose poor dental health is impacting on, or is highly likely to impact on, their medical health e.g children with diabetes, cardiac conditions, epilepsy or inherited metabolic disorder that the benefits of surgery outweigh the risks of bringing a child into hospital during the COVID-19 pandemic.
- Patients whose swallowing is compromised and are at risk of aspirating a tooth which cannot be removed under local anaesthetic²⁴.

Evaluation of the patient before treatment

Patients who present with dental emergencies that will need dental care during this period should be triaged into low or high risk patients based on information from their past medical history in the past two weeks. History of fever $>37.5^{\circ}\text{C}$, sore throat, cough, fatigue, shortness of breath, diarrhoea or and vomiting in the last 2 weeks should be viewed with suspicion. Other information such as contact with anyone who has been diagnosed with COVID-19 or parents or guardian being a health worker should not be overlooked. Since majority of children who are infected with COVID-19 is likely to have mild or no symptoms, all children and their parents/guardian should be regarded as a potential COVID-19 infected person²¹.

Personal protective measures for the paediatric dentist and oral health workers.

Clerking and oral examination of each patient should be done wearing disposable waterproof aprons over the scrubs. Disposable gloves, double fluid resistant

surgical masks and face shield should be worn during the examination.

Non-aerosol-generating procedures

Dental procedures such as oral examination, placement of rubber dam, drilling with slow hand piece and non-surgical extraction are classified as low-risk procedures. N95 face mask or double fluid resistant surgical masks must be worn during this procedure with a face shield.

Aerosol-generating procedures

These include procedures that require the use of high-speed drills, air/water spray, ultrasonic scalers, surgical procedures, use of nitrous oxide sedation and having a patient who is crying during treatment. These are categorized as high-risk procedures due to aerosol generating potential of these procedures and ability to cause cross infection in the dental clinic. It is mandatory to wear full personal protective equipment (PPE) which include surgical gown with water resistant apron, gloves, N95 facemask, full face shields with head cover, safety goggles and shoe covers.

Precautions for paediatric dentist and oral health workers.

Apart from wearing of appropriate personal protective equipment (PPE) in the clinic, oral health workers should observe all precautionary measures to prevent cross infection between and within staff members in the clinic. They should routinely have their body temperatures checked before they are allowed into the clinic for the day's work. Hand washing with soap and use of hand sanitizers should not be taken for granted¹⁶. Dentists should wash their hands before every child's examination, before and after every dental treatment. All oral health team should consciously avoid touching of their eyes, mouth and nose as much as possible during this period.

Dental clinic environment.

Since most dental procedures generate droplets and aerosols, the surfaces in the clinic should be cleaned and disinfected after every dental procedure. All cubicles should also be frequently cleaned and disinfected, including door handles, chairs, desks and other surfaces that aerosols or droplets might have settled during clinical sessions²⁵.

Magazines, toys and objects that are often touched and cannot be cleaned or disinfected should be removed from the children's waiting rooms⁹.

Evaluation of the patient before treatment.

According to the Federal Ministry of Health, COVID-19 guidelines/standard operational procedures for dental practice in Nigeria²¹, at the dental clinic entrance, parents/guardian with their children should undergo mandatory temperature checks with a non-contact thermometer as well as hand washing and use of sanitizer. Not more than one accompanying person should be allowed into the clinic. Crowding should be discouraged in the dental clinic and the waiting room should be well ventilated with open windows, no use of air-conditioners and chairs must be spaced at a space of two metre intervals between parents to maintain physical distancing. Medical protective masks should be available for children and their parents.

Anyone with temperature above 37.5°C should not be allowed into the premises except the cause of the high temperature can be ascertained other than COVID-19 infection. While in the waiting area, parents must fill a mandatory screening form to elicit information that may be of importance to the health workers^{16,25,26}.

Recommendations for treatment

- Before the start of each dental treatment, staff members should put all the instruments and equipment required onto a tray to avoid environmental contamination during the procedure.
- For children who can expectorate, patient's mouth should be rinsed with 0.5- 1% hydrogen peroxide. Hydrogen peroxide has been found to have a non-specific virucidal activity against corona viruses²⁶.
- Parents should leave the operating room except if the child cannot be left alone with the operators.
- Four-handed dentistry techniques is of high importance during this period¹⁵.
- Use of high volume aspirator to reduce droplets and aerosol during high-speed drilling procedures¹⁵.
- Operating field should be isolated with the rubber dam to reduce production of aerosols contaminated with blood and saliva¹⁵.
- High-speed drills with anti-retraction valve are recommended to reduce the return flow of oral bacteria¹⁵.

Management of traumatic dental injuries (TDI)

Traumatic dental injuries are common in children and there is likelihood that it can be seen as an emergency during the COVID-19 epidemic. Traumatic dental injuries in permanent dentition such as avulsion, luxation, crown-root fracture, complicated crown fracture with pulp involvement, should be managed promptly. For an avulsed tooth, it should be re-implanted as soon as possible if prognosis is favourable. Re-positioning and splinting for severely luxated tooth should also be done.

Traumatized primary teeth with severe luxation, mobility or tooth interfering with the occlusion should be removed²⁴. Soft tissues injuries should be debrided and sutured. Patients with maxillofacial lesions may require hospitalization.

Restorative treatment.

Minimally invasive dentistry, such as atraumatic restorative treatment, fissure sealing, selective caries removal and the Hall Technique, should be considered for patients this period.

Treatment under sedation/General anaesthesia

Patients with severe dental emergencies, highly uncooperative children, too young or children with special health care needs should be considered for treatment under sedation or general anaesthesia at this period²⁴.

COVID – 19 positive patient

Dental procedures should not be carried out on a confirmed COVID-19 patients until he or she has been treated and declared negative. In case a COVID-19 positive patient presents with one of the emergency dental conditions, notification of such case should be done to the appropriate infectious disease authority within the hospital and the decision on treatment should be made only after a risk assessment²¹. When a COVID-19 positive patient is cleared for dental treatment, the dentist and the team member must use recommended PPE. Extra-oral radiographs rather than intra oral radiographs should be considered if possible and such patient should be treated last in the clinic. If such patient has an underlying systemic condition, the patient should be managed with their physicians.

After treatment, the door of the clinic should be closed and the windows should be opened for good ventilation. Clinical surfaces and environmental surfaces should be cleaned and disinfected

appropriately. The dental unit can only be reused after an appropriate waiting period. The Nigerian Centre for Disease Control recommends that washing of hands with soap and water for at least 20 seconds after contact with such patients or using an alcohol based hand disinfectant to prevent the spread of the virus.

General oral disease prevention measures during COVID-19 Pandemic

During this COVID-19 pandemic, emphasis should be placed on prevention of oral disease because regular periodic dental check-ups will be difficult. This can be done through social media platforms²².

Conclusion

Being aware of the uncertainty and worry that the coronavirus pandemic is causing everyone, paediatric dentists should work hard to protect their patients, colleagues and family members to reduce the spread of the virus. Despite the fact that there are great volumes of information regarding the COVID-19 pandemic, reliable resources should be put together for the dental team, parents and children. This can be in the form of social stories, poems and infographics²⁷ to prepare them for emergency treatment.

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