

Covid-19: A Pedodontist Perspective

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Abstract: The COVID-19 outbreak has affected human existence in many ways, with uncertainty faced globally. The dental practice and orthodontic care during the pandemic and future practice will require precautionary and selective case evaluation based on the practitioner's judgment to reduce cross-contamination and prevent new outbreaks. This article aims to provide a comprehensive guideline for managing the pediatric dental patients at a clinical setup, using the currently available guidelines.

Keywords: Dental Practice, Infection Control, Pediatric dentist, Pediatric Dental Treatment, Covid-19

Introduction: The corona virus disease 2019 (COVID-19) infection was first identified and reported in the year 2019 in a cluster of cases, caused by a newly identified Beta corona virus. Reported at Wuhan, the capital of China's Hubei province the virus was initially named as 2019 novel corona virus (2019-nCoV) by the World Health Organization (WHO) on January 12, 2020.¹ The incubation period for individual infected with Covid-19 infection is between 2 to 14 days.²

Fever, dry cough, sore throat, loss of taste, loss of smell (anosmia), or tiredness are the most common symptoms at onset of illness and headache, haemoptysis, nausea, vomiting and diarrhoea are the less common symptoms.³ Some patient may report difficulty in breathing or shortness of breath. Pneumonia is also developed in some cases which can be seen on chest X-ray or chest CT. Novel corona virus infection primarily target lung and most common symptoms is acute respiratory distress syndrome (ARDS), effect were also seen in other vital organ such as heart (acute cardiac injury), kidney (acute kidney injury), liver (liver impairment) and death can occur in severe cases.^{4,5}

Dental staff and dental practitioners are considered to be at the highest risk of acquiring SARS-CoV-2 infection because of their prolonged face to face exposure to patients and exposure to respiratory secretions and aerosols produced during procedures like ultrasonic scaling and cavity/ access preparation using a high-speed air rotor with water jet cooling systems.^{1,6} Therefore, it is the need of the hour for dental professionals to update their knowledge regarding disease control and modify their clinical strategies recommended by the authorities to provide safe environment for themselves and their team against infections.⁷ The present scenario has caused pediatric care providers to abruptly suspend active pediatric dental treatment. At present, limited information and guidelines for clinical

pediatric dental care and the management of patients are available.^{8,9} This article aims to provide a comprehensive guideline for managing the pediatric dental patients at a clinical setup, using the currently available guidelines.

Covid-19 infection in healthcare workers¹⁰

The 3 patterns of Covid-19 transmission suggested in the literature include the following: a) sporadic cases occurring in communities; b) transmission within families; and c) nosocomial transmission. Health care related Covid-19 transmission is associated with high morbidity, extended use of mechanical ventilation and fatality rates of up to 5%; this type of transmission can be attributed to shortcomings in observing stringent infection control protocols.

Furthermore, Covid-19 has been reported to be viable in hospital like environments for up to 48 hours with a stability that is unaltered during aerosolization. Healthcare workers could be infected with Covid-19 through exposure in the community or at their workplace, they could be diagnosed late, and they could remain asymptomatic or mildly symptomatic.

Furthermore, unsuspected cases entering healthcare facilities have been considered the main source of MERS-CoV.⁴ Considering these aspects and those healthcare workers may continue to work regardless of being symptomatic, the possibility of transmitting the infection to their patients is also high.

Risk of transmission in a dental office

Saliva can have a pivotal role in the human-to-human transmission, and salivary diagnostics may provide a convenient and cost-effective point-of-care platform for COVID-19 infection. The COVID-19 measures around 120 nm (0.12 μm) and aerosol particle sizes range from 3-100 nm. The use of a FFP3 respirator offers a filtration rate of 99% of all particles measuring up to 0.6 μm. Currently, the COVID-19 transmission routes are still to be determined, but human-to-human transmission is definitely the most evident one.¹¹

Pediatric Dental management and preventive measures during and after Covid-19

Sound knowledge of the spread of SARS-CoV-2 is required to prevent its transmission in the dental practice. Though numerous routes of infections exist in the dental scenario, aerosols are one of the predominant routes for transmission of pathogens including SARS-CoV-2, therefore stringent infection control measures are imperative. Thus, for patient screening and infection control, specific proposals and strategies for dental healthcare practice are critical. Dentists must abide by the most recent recommendations from International, Federal and local public health authorities. Before a patient comes to the clinic, a telephonic appointment must be made with the dentist.¹²

Telescreening and Triaging

The word 'tele' means 'distant', and therefore teledentistry satisfies the need for social distancing as has been advocated by the health authorities all across the globe to contain the spread of SARS-COV-2 virus. Teledentistry can be incorporated into routine dental practice as it offers a wide range of applications such as remote triaging of the suspected COVID-19 patients for dental treatment and decreasing the unnecessary exposure of healthy or uninfected patients by decreasing their visits to already burdened dental offices

and hospitals. Tele dentistry is a safe, convenient approach to resume dental practice during this pandemic. All instruction to the patient can be delivered effectively and at the same time dentist can also assess the need of the dental treatment.¹³

A trained clinical staff member should perform an initial telephone triage or telescreen procedure before the dental appointment to assess the vulnerability of patients and the potential threat they may pose to members of the professional team, other patients, and accompanying people.¹⁴

Use of Pharmacological Agents

Dental treatment of any suspected or confirmed COVID-19 patient ideally must be deferred for 2 weeks from the time of exposure. Analgesics and/or antibiotics can be considered as therapeutic agents in certain cases. During the peak of the pandemic dental treatments should be categorized according to the severity as well as, the extent of invasiveness and risk of the procedure, especially when the federal and local public health authorities have deferred elective treatment. Treatment should be considered after risk vs benefit evaluation keeping in mind the possibility of disease progression, as reversible pulpitis might progress to irreversible, irreversible to apical periodontitis, and further on. There might be consequent tooth loss as well. Dentistry might see a splurge of patients once life resumes its “normalcy” with patients presenting with dental problems of much more severity and poor prognosis.¹²

In-office Screening and Treatment

If a patient requires in-person visit, temperature needs to be checked at the point of entry itself, preferably with a non-contact thermometer, followed by a questionnaire and rapid test if available. To avoid transmission, magazines, toys, and other unnecessary items must be removed from the clinic and appointments should be staggered. In pediatric dental setup, only one parent should accompany the child. Alcohol-based hand rub (ABHR) should be available at appropriate locations in the waiting area to help improve hand hygiene by children, parents, and staff. If treatment needs to be performed, informed consent must be obtained and the operatory must be prepared for the same.¹²

Preparation of Clinic entrance, reception and waiting¹³

- a. Display visual alerts at the entrance of the clinic and reception area about respiratory hygiene, cough etiquette, social distancing, and disposal of contaminated items in trash cans.
- b. As soon as the patient enters the reception area, ask them to wash their hands using hand wash or alcohol-based hand rub. Use tissue paper or hand dryer to dry the hands instead of towels. Tissue paper dispenser and foot-operated waste bin are mandatory.
- c. Include temperature recordings as part of your routine patient assessment before performing any dental procedure. A noncontact forehead thermometer can be used to measure the patient's body temperature.
- d. Use of glass/plastic protective barrier at the reception desk or registration counter help in reducing the chances of infection and ensure safety of staff members.

Appointments should be scheduled such that social distancing can be maintained in the waiting room. Another alternative is for the patient to wait outside or in their vehicle and they can be contacted via telephone when it is their turn to be seen. It is recommended that the patients avoid bringing companions to their appointment, except for instances where the patient requires assistance. This can be communicated to the patient at the time of scheduling an appointment.

Hand hygiene and Personal protective equipment

WHO recommended alcohol based hand rub (ABHR) formulations with 80% ethanol or 75% 2-propanol, has been assessed against SARS-CoV and MERS-CoV, and were found to be effective. Benzalkonium chloride, however, has less efficiency than either of the alcohols, against corona viruses.¹⁵

Use of custom-fit N95 respirator, eye protection, face shield, and overgown during AGMP on confirmed or suspected COVID-19 patients have been propounded. Long-sleeved gloves with double-gloving technique, eyewear including side shields or full-face shields, and hair covers/hoods are recommended.^{15,16}

Proposed pediatric patient management

Dental Problem	Home care	Avoid	Clinical care Advised
Preventive procedures	Oral hygiene instructions: <ul style="list-style-type: none"> • Brushing with fluoridated toothpaste • Flossing Diet modification: <ul style="list-style-type: none"> • Advice fruits and vegetables • Avoid sharing utensils, fermentable carbohydrates, soft drinks 	Three-way syringe	<ul style="list-style-type: none"> • Diet counselling • Topical fluoride gel • Topical fluoride varnish • Pit and fissure sealants
Interceptive procedures	Proper storage and cleaning	Removable space maintainer (saliva	Fixed space maintainer

		spread)	
Space maintainers/palatal expanders			
Broken: If partially glued and still present in mouth	It can be placed back in position but further screw- activation to be avoided, dentist/pedodontist to be informed		
Dislodged	It should be kept safe and dentist/pedodontist should be informed		
Interception of oral habits/orthodontic appliances	<ul style="list-style-type: none"> • Counselling • Oral exercise 		<ul style="list-style-type: none"> • Counselling • Oral exercise • Fixed appliance
Restorative and endodontic procedures			
Caries/reversible and irreversible pulpitis	<ul style="list-style-type: none"> • Rinse and keep cavity clean • Over the counter (OTC) analgesics, antibiotics if required 	Aerosol-producing procedures	<ul style="list-style-type: none"> • Chemomechanical caries removal: Carisolv, papain • ART • SDF • Extraction is preferred for deciduous teeth • Partial pulpotomy, pulpectomy under rubber-dam

			<ul style="list-style-type: none"> • Use of micromotor for access opening • Single sitting preferred • if crowns needed, stainless steel/hall technique
Gingival procedures			
Gingivitis	OHI	Ultrasonic scalers	Hand scaling with antimicrobial rinse
Oral surgical procedures			
Extraction/Exodontia		LA spray	<ul style="list-style-type: none"> • Preoperative mouth rinse • LA gel

Post procedure Disinfection and Decontamination

Following every dental procedure, rigorous disinfection of all the surrounding surfaces should be carried out. Therefore, there should be a time lapse of at least an hour between subsequent appointments to perform thorough decontamination.¹⁷

All disposables should be considered highly infected medical waste and discarded appropriately. The potency of human corona viruses on inanimate objects is up to 9 days at room temperature. Ethanol at concentrations between 62% and 71%, 0.1–0.5% sodium hypochlorite, and 2% glutaraldehyde reduced coronavirus infectivity within 1 minute exposure time. A comparable effect is expected against the SARS-CoV-2 and these agents should be used for appropriate surface disinfection. Hydrogen peroxide vaporizer can also be used to decontaminate the operatory.¹²

Discussion: The dental practice and pediatric dental care during the pandemic and future practice will require precautionary and selective case evaluation based on the practitioner's judgment to reduce cross-contamination and prevent new outbreaks.¹⁸ From the present evidence of COVID-Era, the potential demands for appliance selection include careful patient screening and collection of records; minimal physical visits; utilizing technology at its best;

virtual consultations but the use of PPE for physical appointments; and lesser AGPs with a lesser risk of air-borne transmission.¹⁹

The clinic disinfection protocols during pre-treatment, during treatment, and post-treatment should be strictly followed. The staff and patients' well-being should be given maximum priority.¹⁸ The proposed workflow and guidelines collected from various health regulatory authorities in the article will provide appropriate and effective management of pediatric dental problems during the COVID-19 pandemic and post-COVID practice.

Conclusion:

- SARS-CoV-2 or COVID-19 pandemic has affected the economic, psychosocial, and social lives of pediatric dentist as well as pediatric dental patients, with increased levels of anxiety and distress.
- The clinician should follow the guidelines provided by the concerned health regulatory authorities. Modification and redesign of the dental clinic might be required to maintain efficient air circulation and ventilation and appropriate standard PPE.
- A customized approach should be taken by practices to safeguard patients, patients' families, and dental healthcare personnel during and after this pandemic.

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