

The New Normal in Dentistry after COVID-19 Outbreak



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ABSTRACT

The outbreak of SARS-COV2 responsible COVID-19 disease created a worldwide health emergency. After its first case was accounted for in 2019, 31st December by World Health Organization in Wuhan city of china, and afterward spreading in different nations, with India surpassing cases even the inception nation as on twentieth of May 2020. The WHO declared the disease as pandemic way back and countries over the world adopting lockdown and contact tracing to limit the contagion. The virus transmits person-to-person predominantly through respiratory routes through direct contact, droplets and possibly aerosols. Because of the unique nature of practice in dentistry, most procedure generate significant amount of aerosols and droplets, posing a possible risk of infection transmission. Understanding the concern of risk of transmission in dental practice, this literature is aimed to discuss the possible risk associated with practice and aim to raise awareness of the same with preventive measures, especially amidst pandemic in day to day practice.

Key words: Aerosol; Covid-19; High Volume Evacuator (HVE); Management; Preprocedural mouth rinse; Triage questionnaire

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INTRODUCTION

Coronaviruses is a non-segmented large group, positive-sense RNA genome of ~30 kb that belongs to order Nidovirales which include Coronaviridae, Arteriviridae, Mesoniviridae, and Roniviridae families.¹ The two sub-family of Coronaviridae are Torovirinae and Coronavirinae.¹ People with COVID-19 show symptoms of fever or chills, cough, difficulty breathing, fatigue, muscle or body aches, headache, sore throat, new loss of taste or smell, congestion or runny nose, nausea or vomiting and diarrhoea.² Incubation period can go from 2 to 14 days with most patients only developing mild symptoms.² The far-reaching dynamics and a relatively high R0 of 2-2.5 of COVID-19 radiated it from Wuhan to whole China and rest of the world.³

Given the outbreak and transmission of SARS-CoV-2 and reports of its spread to health care providers,⁴ health

workers and dental professionals are at high hazard for cross infection and can become potential carriers of the disease. In this review article, we expect to bring issues to light on the potential dangers of COVID-19 transmission in dental practice and discuss some preventive measures.

DENTISTRY AND COVID-19

In the current pandemic, Dental professionals seems to be at a high risk of cross infection due to the significant exposure to saliva, blood, and aerosol/droplet production during the majority of dental procedures.^{4,5} SARS-CoV-2 transmission during dental procedures can happen through inhalation of aerosol/droplets from infected individuals or direct contact with mucous membranes, oral fluids, and contaminated instruments and surfaces.⁶ Hence there is always an attributing risk of cross infection and spread

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of the virus because of the unique nature of dental interventions which include enormous aerosol generation and dental staff proximity to the patient's oropharyngeal region.

Due to immediate contact transmission, the mucosa of the mouth has been perceived as a conceivably high-risk of SARS-CoV-2 disease, likewise contaminated hands, contamination of ambience and instruments, dental apparatuses, and surfaces by the use of handpieces with irrigation and air blower favoring diffusion of aerosol particles of blood, saliva, and secretions could encourage infection transmission to patients.⁷ Considering all these, dental professionals even dealing with emergency cases in dental setting need preventive measures to be adopted in order to limit and restrict the contagion.

MANAGEMENT RECOMMENDATIONS FOR CLINIC SETTING DURING PANDEMIC

Triage area

Dental clinics are recommended to establish pre-check triages to record the temperature of every staff and patient as a routine procedure based on the questionnaire (Table 1) to evaluate the risk. Telephonic screening can be performed during the time of scheduling appointments. Staff members who are screening patients to remain 6 feet away from the patient until screening determines a patient is symptom-free and afebrile.⁸ Patients and their accompanying persons are provided with medical masks and temperature measurement once they enter the hospital or clinic setup.⁴ Body temperature should be registered, possibly with a contact-free forehead thermometer, and the presence of suspect symptoms (coughing, sneezing, respiratory difficulty) should be excluded.⁹ If a patient had a positive history of contact and/or symptoms, no treatment should be performed, and the patient should be reported to the authorities, to quickly impose quarantine and/or hospitalization depending on the severity of the situation.⁵ Based on the assessment of emergency questionnaire (Table 2), clinicians can measure the severity of the dental condition and make a decision to either provide or concede dental care. Also, an overview of COVID-19 and its dental management with certain specific measures summarized in Figure 1.

Personal hand hygiene and protection

Hand hygiene practice is important and effective measure for reducing SARS-CoV-2 transmission.^{4,5} Dental professionals should wash their hands before patient examination, before dental procedures, and non-disinfected surfaces or equipment and avoid touching their own eyes, mouth, and nose. A protocol of two-beforehand-

Table 1: Pre-triage & Triage Questionnaire to Evaluate Patients' Potential Risk of SARS-CoV-2 Infection¹⁰

1. Do you currently have any of the following symptoms, such as fever, cough, respiratory difficulty, conjunctivitis, diarrhea, flu?
2. Did you have in the previous 14 d any of the following symptoms, such as fever, cough, respiratory difficulty, conjunctivitis, diarrhea, flu?
3. Did you have any contact with SARS-CoV-2-infected patients in the last 14 d? 4 wk?
4. Did you have any contact with subjects placed in quarantine, either self-disposed or organized by the health authorities, in the last 14 d? 4 wk?
5. Did you have any contact with subjects coming from highly epidemic regions in the last 14 d? 4 wk?
6. Have you been in any situation surrounded by a significant portion of subjects (other than the ones who are normally in quarantine with you) in the last 14 d?

Table 2: Assessment of a true emergency questionnaire

Assessment of true emergency										
1. Are you in pain?										Yes/No
2. What is your level of pain on a scale of 0-10?										
0	1	2	3	4	5	6	7	8	9	10
No pain	mild		moderate		severe		very severe		worst possible pain	
(0)	(1-3)		(3-5)		(5-7)		(7-9)		(10)	
3. When did the pain begin?										
4. Do you have dental abscess (are your gums and/or face swollen?)										Yes/No
If Yes, when did you first notice the swelling?										
5. Do you have fever?										Yes/No
6. Are you having any trouble swallowing?										
7. Are you having any trouble opening your mouth?										Yes/No
8. Did you experience any trauma?										Yes/No
If Yes, please describe the trauma.....										

three-after hand washing was suggested, to reinforce the compliance of hand washing.⁵

As SARS-Cov-2 preferably transmits through airborne droplet and is considered as the main route of spread, particularly in dental clinics and hospitals, barrier-protection equipment, including protective eyewear, masks, gloves, caps, face shields, and protective outwear, is strongly recommended for all healthcare givers within the clinic/hospital settings during the epidemic period of 2019-nCoV.^{4,5}

Preprocedural mouth rinse

Previous studies reported that SARS-CoV is highly susceptible to preprocedural mouth rinse of povidine and would be most useful in cases when rubber dam cannot be used.⁵ As 2019-nCoV is vulnerable to oxidation, preprocedural mouth rinse containing oxidative agents such as 1% hydrogen peroxide or 0.2% povidone is recommended, for the purpose of reducing the salivary

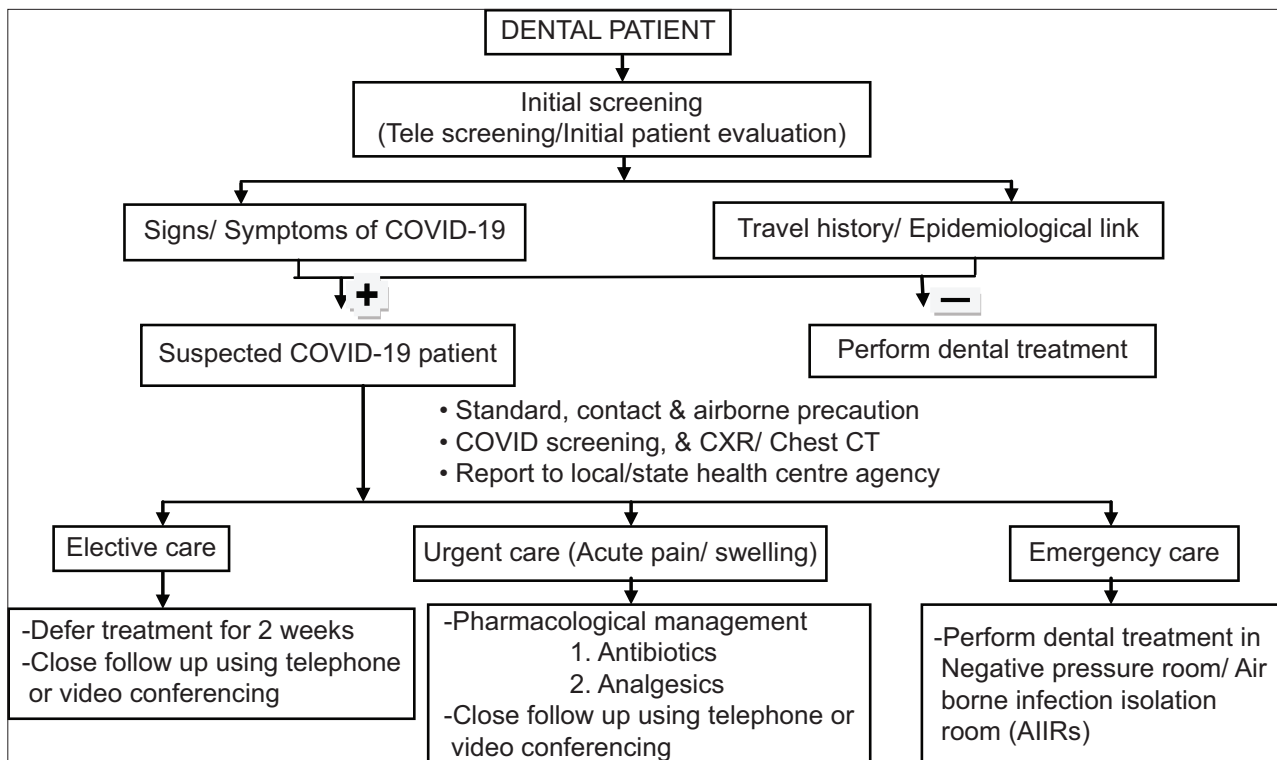


Figure 1: An overview of patient screening for COVID-19 and dental management

load of oral microbes, including potential 2019-nCoV carriage.⁵

Aerosol & high volume evacuator (HVE) device

Aerosol generation in dental care due to its unique nature of practice produce an enormous risk of infection and concern over it. Within the dental setting, the extreme production and persistence of aerosols during dental procedures expose dental workers to the risk of inhaling small particles and droplets, which are reported to potentially carry microorganisms such as bacteria and viruses.¹¹ Studies have suggested that 2019-nCoV may be airborne through aerosols formed during medical procedures.¹² A true aerosol or droplet nuclei may be present within the air of the operatory for up to 30 minutes after a procedure¹³ and thus if the operator removes the protective barrier after completion of the procedure, the potential for contact with airborne contamination remains. So such treatment procedure with significant generation of aerosol may pose significant risks both for practitioners and patients.

Frequently employed methods for removing airborne contamination from the air of the treatment room are with the use of a high efficiency particulate air (HEPA) filter and the use of ultraviolet, or UV, chambers in the ventilation system but they are expensive and takes extended period for treatment, making inappropriate to use in almost all

dental setting.¹⁴ The use of a high-volume evacuator, or HVE, has been shown to reduce the contamination arising from the operative site by more than 90 percent.¹⁵ The usual HVE used in dentistry has a large opening (usually 8 millimeters or greater) and is attached to an evacuation system that will remove a large volume of air (up to 100 cubic feet of air per minute).¹⁴ The small opening of a saliva ejector doesn't remove a large enough volume of air to be classified as an HVE.¹⁴

To limit the aerosol generation or spatter, rubber dam isolation and high-volume saliva ejectors are considered to be "appropriate work practices"-precautions that's recommended for dental practices.^{5,16} Table 3 lists the available methods of reducing aerosols and splatter contamination, as well as their relative effectiveness and costs.¹⁴

Disinfection of the clinic settings

Human coronaviruses such as SARS-CoV-2, Middle East Respiratory Syndrome coronavirus (MERS-CoV), or endemic human coronaviruses (HCoV) can persist on surfaces like metal, glass, or plastic for up to a couple of days.¹⁷ Moreover, it was shown that at room temperature HCoV remains infectious from 2 hour up to 9 days, and persists better at 50% compared with 30% relative humidity.¹⁸ Thus, keeping a clean and dry environment in the dental office would help decrease the persistence

Table 3¹⁴: Methods of reducing airborne contamination

Device	Advantages	Disadvantages
Barrier protection—masks, gloves and eye protection	Part of “standard precautions,” Inexpensive	Masks will only filter out 60 to 95 percent of aerosols, subject to leakage if not well-fitted, do not protect when mask is removed after the procedure
Preprocedural rinse with antiseptic mouthwash such as Chlorhexidine	Reduces the bacterial count in the mouth, saliva and air; inexpensive on a per-patient basis	Tends to be most effective on free-floating organisms; it will not affect biofilm organisms such as plaque, sub-gingival organisms, blood from the operative site or organisms from the nasopharynx
High-volume evacuator	Will reduce the number of bacteria in the air and remove most of the material generated at the operative site such as bacteria, blood and viruses; inexpensive on a per-patient basis	When an assistant is not available, it is necessary to use a high-volume evacuator attached to the instrument or a “dry field” device; a small-bore saliva ejector is not an adequate substitute
High-efficiency particulate air room filters and ultraviolet Treatment of ventilation System	Effective in reducing numbers of airborne organisms	Only effective once the organisms are already in the room’s air, moderate to expensive, may require engineering changes to the ventilation system

of 2019- nCoV with particular attention to door handles, chairs, and elevators suggested.⁵

CONCLUSION

The outbreak of SARS-CoV-2 within the world wide led to public health emergency round the world. With the “New Normal” due to pandemic, health system will certainly have an overload thereon. It is important that case presentations can be dynamic, and there is a decent possibility that dental practitioners may treat a portion of the patients with asymptomatic COVID-19 contaminations since the incubation period can go from 2 to 14 days and most patients only develops mild symptoms. Thus, every patient should be considered as a potentially infected by virus and need to take universal precautions to minimize the spread of the virus and its associated disease during routine or emergency practice and maintain high standards of care and infection control. Moreover, the aerosol and splatter created during dental procedure can possibly spread disease to dental work force and others in the dental office. While, similarly as with all contamination control techniques, though it’s difficult to totally wipe out the hazard presented by dental aerosol, it’s conceivable to limit the hazard with moderately basic and inexpensive precautionary measures.

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AT- Conceptualized and designed the study, Critical revision of the manuscript, Interpretation, literature search; **MNT-** Conceptualized the study, literature search, prepared first draft of the manuscript, review of the study, Manuscript review; **RLT-** Concept of the study, Interpretation, Manuscript review; **M-** Literature search, review of the study

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