

COVID-19: The Role of the Periodontologist

Opeodu OI

Department of Periodontology & Community Dentistry, College of Medicine,
University of Ibadan, Ibadan, Nigeria.

Correspondence: Opeodu OI
E-mail:opeodulanre@yahoo.com

Abstract

COVID-19, since its outbreak in Wuhan, China has become a major public health phenomenon with the eventual declaration of a pandemic by the World Health Organization (WHO) in March 2020. The disease is considered to be transmitted through fomite and aerosol, therefore the concern for safety of both the dental teams and their patients. This review article seeks to report how the disease may possibly be transmitted within periodontal clinic and possible means of preventing such transmission. Internet search was done using words such as COVID-19, Dentistry, SARS-CoV-2, periodontal care, dental treatment, infection control and pandemic. Only articles written in English were accessed.

Keywords: COVID-19, SARS-CoV-2, Pandemic, Periodontology

Introduction

The novel coronavirus 2019 was first reported in Wuhan, China in December 2019 but has since then spread to most parts of the world, with the World Health Organization (WHO) declaring it a pandemic in March, 2020. The International committee on Taxonomy of Viruses referred to the virus as "severe acute respiratory syndrome coronavirus 2" or SARS-CoV-2 because of its close relationship with the virus that was responsible for the outbreak of SARS in 2003. However, WHO generally uses the name COVID-19 to address the virus in order to avoid confusion in the general public. The name COVID-19 was adopted for the virus by WHO on the 11th February, 2020 as a shortened form for coronavirus disease 2019. The virus is oftentimes also called novel coronavirus or 2019 coronavirus¹.

Generation of aerosol during periodontal treatment usually leads to contamination of the clinic environment. Sometimes cloud of fluid and particulate matter may be seen during periodontal procedures involving the use of rotary instruments, air abrasion, air-water syringe, sonic/ultrasonic scaler and polishing. Apart from the dental instrumentation, other sources of the air-borne contamination is a combination of materials originating from the treatment site, saliva, respiratory sources and from the dental unit water lines^{2,3}.

Contamination of dental instruments can result from organisms on instruments and in dental unit water lines. However, the standard procedure for cleaning and sterilisation should suffice to eliminate contamination of all instruments and eliminate or minimize air-borne contamination from the dental unit water line. But with the advent of the coronavirus pandemic across the globe, the threat of transmission of the disease during periodontal treatment is a reality that must be thoroughly considered in order to prevent such transmission as much as possible^{2,4,5}. This is despite the fact that there are previous conflicting reports from studies concerning the possibility of the airborne nature of SARS-1^{6,7}. Some authors have suggested that dental treatment should be limited to only emergency cases, while the pandemic lasted in order to prevent transmission of the disease during dental treatments⁸⁻¹⁰.

How COVID-19 spreads

The spread of the virus is considered to be due to a release of droplets of infected material following coughing, sneezing and even exhalation phase of the respiratory cycle by someone who is infected with the virus. The initial thinking was that the droplets settle on nearby surfaces such as desks, tables or telephones and other people can be infected

following their contact with the infected surfaces and touching their faces with contaminated hands. But lately, the virus had been reported to be able to float in the air as aerosol through which it can spread from one person to another³. Aerosol generated during dental treatment is usually contaminated with body fluid and high concentrations of infectious microbes exceeding those produced by coughing or sneezing^{11,12}. Many studies have reported that the stability of SARS-CoV-2 is similar to that of SARS-CoV-1 under many conditions including being suspended in the air as aerosol for hours and on surfaces such as stainless steel, cardboard and copper for varying periods^{4,5,13,14}. Therefore, the air-borne nature of the infection through aerosol being a possibility is likely going to increase the risk of possible transmission of the virus during periodontal treatment especially considering the closeness of the operator to the patient during the procedures.

Symptoms of COVID-19

Knowledge of the symptoms may be instructive in the eventual protection of dentists and other members of the dental team against contracting the disease within dental clinics. The disease may be asymptomatic in some people, who can still spread the virus to other people despite the absence of symptoms in them. However, infected individuals may present with symptoms such as fever, dry cough, and tiredness in mild cases. Shortness of breath, fatigue, muscular pain, soreness of the throat, diarrhea, vomiting, confusion and headache are other symptoms that had been associated with the disease^{15,16}. The most commonly reported sign and symptoms are fever (90%), cough (76%), dyspnea (55%) and myalgia or fatigue (44%)⁹. Travel history and history of contact with confirmed case or those with symptoms of COVID-19 may be helpful especially in asymptomatic individuals.

Setting Priorities for Periodontal treatment

The possibility of postponing non-emergency periodontal therapy until the end of the pandemic should be considered. This may go a long way in disrupting the transmission chain and reducing the burden of the disease. Therefore, routine professional prophylaxis should be postponed until the pandemic is over and short-term use of chemical plaque control agents may be recommended for some individuals to reduce the rate of plaque accumulation and inflammation. The use of telephone and other means of communication may be helpful in getting to know which of the regular

patients can be rescheduled and those that will be seen as emergency¹⁷. Those patients that will be seen under emergency will include those in severe pain that could not be controlled by analgesic, profuse gingival bleeding, acute periodontal abscesses and those with compromised medical conditions whose lives may be endangered by active periodontal diseases.

Dental visitation: Pre-treatment

Individuals coming for periodontal therapy should be ready to abide with the laid down regulations, such as use of facemask, washing of hands or the use of alcohol-based hand sanitizer. Checking of body temperature, preferably with a non-contact infra-red thermometer should be instituted at the entrance of the clinic. This is to ensure that anyone with fever is further screened for other symptoms of COVID-19 and infected individuals identified early enough. Posters, in appropriate languages, demonstrating all that is required of individuals at the clinic should be placed at strategic positions at the entrance to and within the clinic. This should also include posters demonstrating cough and sneezing etiquette and clearly highlighted demarcation of sitting arrangement while waiting at the lounge before being attended to.

Staggered appointments in order to reduce number of patients at the clinic at the same time should be encouraged in order to maintain social distancing. If there is any reason(s) for more patients than that which will allow for social distancing within the waiting area to be present, then some of the patients should be encouraged to wait in their vehicles to be contacted through telephone for their appointment. Number of individuals accompanying dependent patients to the clinic should also be reduced to the most essential people that must accompany any particular patient⁽¹⁰⁾. Any procedure that will generate aerosol should be scheduled as the last procedure for the day when other patients would have left and the number of dental team to be present may be reduced to the barest minimum.

Dental visitation: During-treatment

Dental care team must adhere strictly to infection control protocol in order to prevent transmission of the disease within the dental clinic. The protocol should include hand hygiene, change of disposable face masks after attending to each patient and even during treating a patient if the mask gets wet or contaminated by body fluid. Correct use of personal protective equipment should also be enforced when

attending to patient, for example hazardous materials suit and N-95 or a higher level respirator should be used when aerosol generating procedure is to be done. Isolation gown and head cap for the hair and the eyes should be well protected with the use of protective eye glasses or face shield. The dentist should also keep abreast with new updates on the latest discovery about the virus and methods of managing the disease^{9,10}. Use of mouth rinses such as 1% hydrogen peroxide or 0.2% povidone iodine have been recommended for pre-procedural use. This is with the intention of reducing the viral load, where coronavirus status of the patient is not known¹⁸. High volume suction is also recommended during procedures in order to reduce the rate of aerosol generation^{10,19}.

Patient-operator positioning during aerosol generating procedure also matters as standing in front of the patient may worsen the risk of splatter on operator. Therefore, working from 8'o clock position should be avoided, while 10-11'o clock is recommended¹⁰. Use of eye goggles to protect the eyes of patient during treatment is also advisable.

Post-treatment

In a resource-limited environment because coronaviruses lose viability appreciably after 72 hours, a rotation and reuse strategy have been advocated for N95 respirators. Extended use is when the mask is used for more than 8-hours, including in-between patient. In the case of mask re-use, mask rotation is recommended, in which a set of at least five N95 respirators are acquired and one is used per day of the week (> 72 hours). Proper handling of the mask involves hanging the respirators to dry or keeping them in a clean, breathable container like a paper bag in-between uses. The masks should not touch each other and avoiding mixing it up with those of other individuals. A user seal check should be performed before each use. A significantly contaminated or damaged mask should not be used again. Therefore, when planning to re-use a mask, a fastidious donning/doffing technique should be adopted to prevent contamination of both the inside and the outside of the mask. Wearing a face shield over the mask will prevent soiling, which may help in cases of extended use or re-use^{20,21}.

Regular fumigation of the clinic environment should be encouraged as much as possible, with mopping of floor with 1% sodium hypochlorite in order to reduce the risk of cross infection. Particular attention should also be placed on the management of waste that is generated from the clinic as the waste is often

contaminated with body fluid. Therefore, incineration of the waste is advised, where possible. The water line especially the sputum bowl and the drain should be regularly disinfected with 0.01% sodium hypochlorite in-between patients¹⁰. Patients' follow-up can be done through telephone and other technological means in order to limit the number of patients in the clinic.

Conclusion

It is advisable that non-emergency periodontal treatment should be postponed till after the pandemic, while extreme caution should be exercised when attending to those that must be seen during the pandemic.

References

1. COVID-19: New scientist (<https://www.newscientist.com/term/covid-19/> last accessed 19/8/2020).
2. Harrel SK, Molinari J. Aerosol and splatter in Dentistry. A brief review of the literature and infection control implications. *J Am Dent Assoc.* 2004; 135:429-437.
3. World Health Organization bulletin: Getting your workplace ready for COVID-19 (Accessed from <https://www.who.int/docs/default-source/coronaviruse/advice-for-workplace-clean-19-03-2020.pdf> on 17/8/2020).
4. Ong SWX, Tan YK, Chia PY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *J Am Med Assoc.* 2020; 323:1610-1611.
5. Setti L, Passarini F, Gennaro GD et al Airborne transmission route of COVID-19: Why 2 meters/6 feet of inter-personal distance could not be enough. *Int J Environ Res Pub Health* 2020; 17:2932 (DOI: 10.3390/ijerph17082932).
6. Tsai Y, Wan G, Wu Y, Tsao K. Airborne severe acute respiratory syndrome coronavirus concentrations in a negative-pressure isolation room. *Infect Control Hosp Epidemiol* 2006; 27:523-525.
7. Booth TF, Kournikakis B, Bastien N et al. Detection of airborne severe acute respiratory syndrome (SARS) coronavirus and environmental contamination in SARS outbreak units.



8. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): Emerging and future challenges for dental and oral medicine. *J Dent Res* 2020; 99:481-487.
9. Fallahi HR, Keyhan SO, Zandian D, Kim S, Cheshmi B. Being a front-line dentist during the Covid-19 pandemic: a literature review. *Maxillofac Plastic Reconstruct Surg* 2020; 42:12 (<https://doi.org/10.1186/s40902-020-00256-5>).
10. Bhanushali P, Katge F, Deshpande S, Chimata VK, Shetty S, Pradhan D. Covid-19: Changing trends and its impact on future of Dentistry. *Int J Dent* 2020 (<https://doi.org/10.1155/2020/8817424>).
11. Holloman JL, Mauriello SM, Pimenta L, Arnold RR. Comparison of suction device with saliva ejector for aerosol and spatter reduction during ultrasonic scaling. *J Am Dent Assoc* 2015; 146: 27-33.
12. Barnes JB, Harrel SK, Rivera-Hidalgo F. Blood contamination of the aerosols produced by in vivo use of ultrasonic scalers. *J Periodontol* 1998; 69:434-438
13. Doremalen NV, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med* 2020; 382:1564-1567 (DOI: 10.1056/NEJMc 2004 973).
14. Chan JF, Yuan S, Kok KH et al. A familiar cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet* 2020; 395(10223):514-523.
15. Chen N, Zhou M, Dong X et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020; 395(10223): 507-513.
16. Guan W-J, Ni Z-Y, Hu Y et al. clinical characteristics of 2019 novel coronavirus infection in China. *MedRxiv*. Doi:10.1101/2020.1102.1106.20020974.
17. Guo H, Zhou Y, Liu X, Tan J. The impact of the COVID-19 epidemic on the utilization of emergency dental services. *J Dent Sci* (<https://doi.org/10.1016/j.jds.2020.02.002> accessed on 27/8/2020).
18. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus Disease 19 (COVID-19): implications for clinical dental care. *J Endodontics* 2020; 46:584-595.
19. Swaminathan Y, Thomas JT. Aerosol – A prospective contaminant of dental environment!. *IOSR J Dental Med Sci* 2013; 11:45-50.
20. SAGES. N95 Mask reuse strategies. Society of American Gastrointestinal and endoscopic surgeons, Los Angeles CA, USA. 2020, <https://www.sages.org/n-95-re-use-instructions/>.
21. Centers for Disease control and Prevention, Recommended Guidance for Extended use and limited reuse of N95 filtering facepiece respirators in health care setting, Centers for disease control and prevention, Atlanta, GA, USA, 2020. <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>.