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Review Article

A literature review on precautionary measures in dental practice during the pandemic: Covid-19

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ABSTRACT

During the spread of pandemic disease, dental practice come across the highest risk of corona virus infection by the exposure from patient saliva, aerosols generation during the dental procedure, blood contamination during oral surgical procedure. This virus can be transmitted from symptomatic to asymptomatic individual through aerosol spread, saliva contamination. Due to its ability of airborne transmission, so aerosols generated through natural activity or during the time of any dental treatment procedure has the ability to transmit the virus from infected person to the surrounding person.

1. Introduction

In the month of December 2019, 27 patients of unknown etiology admitted to the hospital with pneumonia that is of unknown etiology, with primary symptoms of high grade fever, difficulty in breathing, chills. These all the patients traced to be having history of with visit to sea food market of Wuhan, China.[1,2] Test report from all the patients revealed that these all patients were suffering from severe acute respiratory syndrome corona virus as the prime factor of the disease.[3] The pandemic of corona virus disease was declared by the government in the month of February 2020.[4,5] This corona virus is found to be spherical in nature and having glycoprotein over its surface spiked, that gives this virus a crown like projections.[6] Studies revealed that corona virus stays over a human body after contact from an infected person from 2 hours upto 9 days.[6] By the month of June 5^{th} 2020, according to world health organization, this virus affects 216 countries, more than 6 million patients affected from the same.[7]

The rapid transmission of this corona virus disease is might be due to easy route of transmission of the virus through air borne respiratory droplets and through direct contact trans mission from the infected individual to the normal one. Primary concern from direct transmission via coughing or sneezing from the infected individual, through fecal oral route through vertical transmission directly from the mother to the baby, through field transmission from contaminated surface.[8,9]

Studies revealed that this virus can survive in the aerosols generated by infected individual. This corona virus can survive over the plastic and stainless steel surfaces for up to 7 days, over clothes for 2 days, over the wood surface for 2 days, and most importantly on the outer layer of surgical mask for 7 days.[10–12]

Saliva plays a major role in the transmission of corona virus, via aerosols created by natural activities like coughing, sneezing, breathing. So dental practioner are at higher risk as they work in close proximity to the oral cavity by the generation of aerosols during the use of high speed

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instruments that results in generation of aerosols and during minor oral surgical procedures also where there is direct contact with the blood. Studies revealed that saliva sample from posterior or pharyngeal swab were found to be positive for viral load from the onset of symptoms till twenty five days from the onset of symptoms. This corona virus could be present in the saliva from three pathways i.e. secretions from upper as well as lower respiratory tract and the oral cavity, gingival crevicular fluid that is present in the gingival crevices ids potential enough to add virus to the saliva in the oral cavity, and third option is saliva from minor salivary glands can be a source of virus in the oral cavity, because the cells of minor salivary glands are initially get targeted by the corona virus through the receptors of angiotensin converting enzyme – 2 receptors.[13–18]

Study revealed that there were 38% decline of dental practice during the pandemic break down. However there is increase in rate of dental or oral infection from 51 percent to 71 percent.[19]

1.1. Precautionary measures to be taken in the pandemic time

1. Initially one should go for tele dentistry that includes, tele screening tele consulting is highly recommended that should be the primary point of contact between the patient and the dentist. Detailed medical history from the patient should be gathered like information about fever, cough, breathlessness, chills, sore throat, runny nose, diarrhea, lethargy, weakness. If any of the above reply is yes to the above said, the appointment should be delayed for atleast three weeks until there is no dental emergency.[20,21] In case if patient need analgesics or antibiotics can be prescribed to the patient through tele dentistry itself by the dentist, till the appointment is not scheduled to the dental clinic. During the spread of the corona virus time all the nonessential things like dental models, brouchers, magazines should be removed as is taken as potentiate surface for the spread of the disease. In the patient waiting area the chairs should be placed at a six feet distance to each other to avoid gathering of the patient.[22] Patient , staff should be asked to hold off accessories like bracelet, chains, necklace to avoid surface contamination of the objects. Sanitization, disinfection of the area must be assured by the dental staff to prevent the spread of the virus.[22]
2. In office visit protocol should be maintained properly by the patient as well as by the dental staff. Prior to the visit of the patient to the dental clinic his/her appointment should be confirmed the dental clinic itself telephonically. No other person is allowed to vicit the clinic other than the patient itself exception should be given to children or people with special need. Before entry in to the dental office hand sanitization should be done to the patient, mask should be provided to the patient as well as to the dental staff, before entering in to the dental clinic temperature of the patient should be monitored.[22] In operatory preparation one should use high efficiency particulate air filter that is commonly present in air purifiers and are portable.[23]
3. Hand sanitization should be performed on regular intervals by the dental staff as well as to the patient also before entering the dental office. Hand wash is very crucial when one is coming in contact with surfaces, equipment's, patients. Touching nose, mouth, head, and eyes with the bare hands should be strictly restricted and must be avoided. Soap or alcohol based hand rub should be used for the purpose of sanitization.[24]
4. Mouth rinse should be used before even checking the oral cavity for the diagnostic purpose. The efficacy of chlorhexidine mouth wash in eliminating the covid-19 virus is a matter of conjecture.[24,25] Studies revealed the use of povidone mouth wash is promising one to eliminate the virus.[26] Another study revealed that use of povidone mouth wash along with povidone nasal spray is very much helpful in reducing the spread of aerosol generated during high speed dental procedure.[27]
5. Use of personal protective equipment by the dental staff while doing any procedure during this time is very much helpful as well as required to prevent the spread of the disease via aerosol generated during the procedure. These aerosols generated are contaminated with the saliva of the patient and can transmit the virus to the dental operator as well as to the other dental staff. So the patient should be asked to place the surgical mask covering his/her mouth along with nose as soon as the procedure is completed and as well as when the patient entered the dental clinic.[28]
6. Filtering the contaminated air in the dental office is very much required as well as essential to prevent the spread of the disease. Different types of filters can be used to filter the air like high volume evacuator and high efficacy particulate arrestor. HVE is quite inexpensive and help in filtering of air by 90 percent at 2.83 m^3 per minute. However the other device i.e. HEPA is quite expensive and can filter the air at 99.97 percent of 0.3 μm particles. CDC proposed the use of HEPA air filters during any procedure that result in aerosol generation.[28]
7. Surface disinfection is very much essential in the dental office, as it was stated that viral particle have the capability to remain on the surface for upto 9 days. So maintaining proper disinfection of the dental office surface is mandatory to inhibit the spread of the disease. Chemicals like ethanol with concentration of 67 to 71 percent, hydrogen peroxide with concentration

of 0.5 %, 0.01% sodium hypochlorite i.e. 0.1g/L within a minute should be used for the process of disinfection.[29]

8. Proper disposal of ppe kit should be followed in a specific color coded bag. Face shield, eye protective glass ware should be properly disinfected with disinfection or if possible autoclave. ABHR must be used after treatment of every patient. Follow up of the patient must be there, to check any symptoms for the same.

2. Conclusion

In this time period of pandemic disease one should take care of the patient as well as of him/herself with proper precautions taken.

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4. Conflicts of Interest

There are no conflicts of interest.

References

1. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J Autoimmun*. 2020;109:102433. doi:10.1016/j.jaut.2020.102433.
2. Bogoch II, Watts A, Thomas-Bachli A, Huber C, Kraemer MUG, Khan K, et al. Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel. *J Travel Med* . 2020;27(2):8. doi:10.1093/jtm/taaa008.
3. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: Implications for virus origins and receptor binding. *Lancet*. 2020;395:565–74.
4. Kakodkar P, Kaka N, Baig MN. A Comprehensive Literature Review on the Clinical Presentation, and Management of the Pandemic Coronavirus Disease 2019 (COVID-19). *Cureus*. 2020;12:7560. doi:10.7759/cureus.7560.
5. Kochhar AS, Bhasin R, Kochhar GK, Dadlani H. Provision of continuous dental care for oral oncology patients during & after COVID-19 pandemic. *Oral Oncol*. 2020;106:104785. doi:10.1016/j.oraloncology.2020.104785.
6. Suri S, Vandersluis YR, Kochhar AS, Bhasin R, Mohamed-Nur A. Clinical orthodontic management during the COVID-19 pandemic. *Angle Orthod*. 2020;90(4):473–84. doi:10.2319/033120-236.1.
7. Corona virus disease (COVID outbreak situation:WHO); 2020. Available from: https://www.who.int/emergencies/diseases/novelcoronavirus-2019.
8. Anderson EL, Turnham P, Griffin JR, Clarke CC. Consideration of the Aerosol Transmission for COVID-19 and Public Health. *Risk Anal* . 2020;40(5):902–7. doi:10.1111/risa.13500.
9. Izzetti R, Nisi M, Gabriele M, Graziani F. COVID-19 Transmission in Dental Practice: Brief Review of Preventive Measures in Italy. *J Dent Res*. 2020;99(9):1030–8. doi:10.1177/0022034520920580.
10. Doremalen N, 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(16):1564–7. doi:10.1056/nejmc2004973.
11. Ren SY, Wang WB, Hao YG, Zhang HR, Wang ZC, Chen YL, et al. Stability and infectivity of coronaviruses in inanimate environments. *World J Clin Cases*. 2020;8(8):1391–9.
12. Chin AWH, Chu JTS, Perera MRA, Hui KPY, Yen HL, Chan MCW, et al. Stability of environmental conditions. *Lancet Microb*. 2020;1:10.
13. To KK, Tsang OT, Leung W, Tam AR, Wu T, Lung DC, et al. Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. *Lancet Infect Dis*. 2020;20(5):565–74.
14. To KK, Tsang OT, Chik-Yan C, Yip KH, Chan TC, Wu JMC, et al. Consistent detection of 2019 novel coronavirus in saliva. *Clin Infect Dis*. 2020;71(15):841–3.
15. Azzi L, Carcano G, Gianfagna F, Grossi P, Gasperina DD, Genoni A, et al. Saliva is a reliable tool to detect SARS-CoV-2. *J Infect*. 2020;81(1):e45–e50. doi:10.1016/j.jinf.2020.04.005.
16. Sabino-Silva R, Jardim ACG, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. *Clin Oral Invest*. 2020;24(4):1619–21. doi:10.1007/s00784-020-03248-x.
17. Liu L, Wei Q, Alvarez X, Wang H, Du Y, Zhu H, et al. Epithelial Cells Lining Salivary Gland Ducts Are Early Target Cells of Severe Acute Respiratory Syndrome Coronavirus Infection in the Upper Respiratory Tracts of Rhesus Macaques. *J Virol*. 2011;85(8):4025–30. doi:10.1128/jvi.02292-10.
18. Zhou P, Yang X, Shi Z. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579:270–3.
19. Long L, Corsar K. The COVID-19 effect: number of patients presenting to The Mid Yorkshire Hospitals OMFS team with dental infections before and during The COVID-19 outbreak. *Br J Oral Maxillofac Surg* . 2020;58(6):713–4. doi:10.1016/j.bjoms.2020.04.030.
20. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus Disease 19 (COVID-19): Implications for Clinical Dental Care. *J Endod*. 2020;46(5):584–95. doi:10.1016/j.joen.2020.03.008.
21. Maret D, Peters OA, Vaysse F, Vigarios E. Integration of telemedicine into the public health response to COVID-19 must include dentists. *Int Endod J*. 2020;53(6):880–1. doi:10.1111/iej.13312.
22. Fiorillo L, Cervino G, Matarese M. COVID-19 surface persistence: a recent data summary and its importance for medical and dental settings. *Int J Environ Res Public Health*. 2020;17(9):3132.
23. Kim HJ, Ko JS, Kim TY. Recommendations for anesthesia in patients suspected of COVID-19 Coronavirus infection. *Korean J Anesth*. 2020;73(2):89–91.
24. Ge Z, Yang L, Xia J, Fu X, Zhang Y. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *J Zhejiang Univ Sci B*. 2020;21:361–8.
25. Fallahi HR, Keyhan SO, Zandian D, Seong-Gon K, Cheshmi B. Being a front-line dentist during the Covid-19 pandemic: a literature review. *Maxillofac Plast Reconstr Surg* . 2020;42(1):12. doi:10.1186/s40902-020-00256-5.
26. Farzan A, Parsa F. Common mouthwashes for pre-procedural rinsing in dental practice: Which one is appropriate for eliminating coronaviruses? A mini literature review. *Regen Reconstr Restor*. 2020;5(2). doi:10.2139/ssrn. 3563092.
27. Kirk-Bayley J, Challacombe S, Sunkaraneni V, Combes J. The Use of Povidone Iodine Nasal Spray and Mouthwash During the Current COVID-19 Pandemic May Protect Healthcare Workers and Reduce Cross Infection. *SSRN Electronic J*. 2020;doi:10.2139/ssrn.3563092.
28. Guidance for Dental Settings | CDC n.d. [Last accessed on 2020 May 22]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/dentalsettings.html.
29. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect*. 2020;104(3):246–51. doi:10.1016/j.jhin.2020.01.022.

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