

Amidst Pandemic: Dentistry 2020

Dr. Ankita Srivastava¹, Dr Deepa Yadav², Dr H. Murali³

¹M.D.S., Senior Lecturer, Department of Conservative Dentistry and Endodontics, Purvanchal Institute of Dental Science, Gida, Uttar Pradesh 273209, India

Corresponding Author: [ankitasrivastava50\[at\]gmail.com](mailto:ankitasrivastava50[at]gmail.com)

²PG Diploma in Conservative Dentistry and Endodontics and Aesthetic Dentist, Ex-P.G Diploma in Conservative Dentistry and Endodontics Student, D.A P.M R.V Dental College, Bangalore, India
[deepa.s.yadav\[at\]gmail.com](mailto:deepa.s.yadav[at]gmail.com)

³M.D.S., Professor, Department of Conservative Dentistry and Endodontics, D.A P.M R.V Dental College, Bangalore, India

Abstract: *The present outbreak of epidemic virus i.e. COVID-19 originating in Wuhan, China constitutes a major public health emergency of global concern impacting several countries, affecting more than 30,055,710 patients. The diseases have shown human-to-human transmission via direct contact, droplets and possible aerosol transmission affecting people irrespective of nation, race, caste and socioeconomic status. Since COVID-19 has been detected in infected patient's saliva, its outbreak is an alert to all the dental and other health professionals to be vigilant in defending against the spread of the virus. It is crucial for dental practitioner to undertake appropriate preventive and infection control measures to limit the transmission of virus considering the unique nature of dental procedures. This review articles introduces essential knowledge about COVID-19 and nosocomial infections in dental settings and provide recommended management protocols for dental practitioner that should be implemented during such outbreak.*

Keywords: Coronavirus; COVID-19; Aerosol; Infection control; Dental practice management

1. Introduction

Since the year 1000, viral infections have been a major concern for medical professionals when the poxvirus had spread through an extensive region of China. At the time of Black Death bubonic plague in 1347-1351, approximately 75-200 million people were killed in European continent to pox virus infection. Meanwhile in the era of 1901, first human infected virus i.e. Flavivirus causing Yellow fever was responsible for death of more than 50 million people. Further in the year 1918-1920 pandemic, Spanish flu(H1N1) was considered as one of the greatest medical holocaust affecting millions of people across the world⁽¹⁾.

Recently, a rapid emerging outbreak of Coronavirus (COVID-19) originating in the city of Wuhan in late December 2019 has become a significant public health liability of today's world claiming thousands of lives every day. World Health Organization (WHO) has declared the pandemic COVID-19 as public health emergency of international concerns affecting a wide range of population irrespective of nation, race, caste and socioeconomic status.^(2,3) According to WHO statistical report dated 18th September 2020 on COVID-19, there has been more than 30,055,710 reported cases and 943,433 death across the globe with USA, South Africa and India among the worst affected countries.⁽²⁷⁾

Current data revealed that COVID-19 might have been initially hosted by bats, and may have been transmitted to human through wild animals sold at the Huanan seafood market, China as several patients with COVID-19 were found to be epidemiologically associated with Huanan seafood market⁽⁴⁾. Although India has curtailed the spread of this virus to certain extent by imposing a nationwide lockdown; but still the number of reported cases has crossed

5,308,014 with approximately 85,625 death which continues to rise.^{(5) (28)}

The unpredictable biological behaviors of the virus, erratic evolving instructions from WHO, variable instructions for quarantine and management protocols of the pandemic has increased uncertainty causing apprehension and anxiety among various health care workers⁽³⁾. Taking in to consideration the nature of their profession, health care workers (HCW) are at the highest risk of acquiring this infection.⁽⁶⁾ Among the Western European countries, approximately 14% of confirmed COVID-19 cases are from medical professionals, which is the maximum number of cases reported among doctors and nurses.⁽³⁾

The health crisis associated with this virus has disrupted working of all medical communities globally, including delivery of essential medical and dental service.⁽⁵⁾ Though at present, there have been no reported cases of SARS-CoV2 transmission in dental setting according to an analysis of O*Net Bureau of Labour Statistics of USA, dentist are among the group of health care workers with maximum risk of contracting the infection as they work in close proximity to patients oral cavity.⁽⁷⁾ This risk can be associated with the distinctive nature of dental interventions inclusive of aerosol generation, handling of sharp instruments etc.⁽⁸⁾ Owing to sizeable number of COVID-19 patients and several hotspots, dental practices and hospitals in various countries as well as in India have been shut with only emergency cases to be undertaken following recommended protocols.⁽⁹⁾

Thus, rapidly increasing patients of COVID-19 not only presents a public health challenge but also has significant medical and ethical implications for the care of dental patients. Although, there is a paucity of studies guiding dental practices, various protocols have been developed and reported to promote best practices for the patients by Dental Societies. However, an application of these guidelines is a

Volume 9 Issue 10, October 2020

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

challenge in many parts of the world where health care organizations are not well established.⁽³⁾

Hence, better insight of the structure of the virus, its mode of transmission, clinical presentation and testing methods is required to form protocols for dental professional to identify cases and prevent further spread of infection to the patients and Dental Health Care Providers.

What is COVID-19?

Viral etiology

Coronaviruses belong to the family of zoonotic virus Coronaviridae primarily targeting the human respiratory system comprising of large, single, plus-stranded RNA as their genome^(4,10). It is mainly divided into four genera, namely alpha, beta, delta and gamma with alpha and beta primarily affecting respiratory, gastrointestinal and central nervous system in humans whereas gamma and delta mostly infect birds.⁽¹⁰⁾

The viral genome was found to be 75-80% similar to the SARS-COV-1 which has caused the SARS epidemic.⁽¹¹⁾ This virus bind to their target cells via angiotensin-converting enzyme 2 (ACE 2) expressed in epithelial cells of lung, intestine and blood vessels. COVID-19 has been classified as Beta-CoV of group 2B by World Health Organization.⁽⁴⁾

Incubation period

On an average, the incubation period of COVID-19 has been estimated to be 5-6 days. However, there has been evidence that it can last for as long as 14days, which is now the commonly adopted time period for medical observation and quarantine of (potentially) exposed individual.⁽¹²⁾

Clinical Manifestation

Most common clinical symptoms reported by patients include fever, dry cough and myalgia. Further, less noticeable symptoms like nausea, diarrhea, reduced sense of smell (hyposmia) and abnormal taste sensation (dysgeusia) have also been reported.⁽¹³⁾ Pneumonia like symptoms is also commonly found in many patients showing multiple small patchy shadows and interstitial changes remarkable in the lung periphery on chest X-ray or chest CT⁽⁵⁾.

In severe cases, organ dysfunction such as acute respiratory distress syndrome (ARDS), acute cardiac injury (shock and arrhythmias), acute kidney injury and death can also occur. Risk factors associated with poor outcome of the disease are age and underlying comorbidities such as hypertension, diabetes, cardiovascular and cerebrovascular disease.⁽⁵⁾

Notably, about 80% of patients may have only mild clinical presentation resembling flu like symptoms and seasonal allergies, which may lead to rise in number of undiagnosed cases in turn can act as "carriers" and also reservoir for re-emergence of infection.⁽⁸⁾

Possible transmission routes of 2019-NCOV

Genetic and epidemiological studies revealed that COVID-19 outbreak began with single transmission from animal to human followed by ongoing human-to-human spread.⁽¹⁴⁾

The main transmission route of this virus is thought to be from person to person.⁽⁴⁾

- 1) Amongst people who are in close contact with one another
- 2) Through respiratory droplets produced while coughing and sneezing from an infected person
- 3) Faecal-oral route might also be a mode of transmission

Although clinical manifestations of COVID-19 do not contain eye symptoms, the investigation of conjunctival samples from confirmed and suspected cases shows that the spread of is not limited to the respiratory tract, and eye exposure might be a possible way for the virus to permeate. Transmission can also be possible directly or indirectly via saliva.^(15,16)

Possible transmission route of COVID-19 in dental clinics

Owing to the specificity of dental procedure involving face-to-face communication with patients, and frequent exposure to saliva, blood and other body fluids, and handling of sharp instrument, dental clinics carries the risk of COVID-19 infection. Droplets and aerosols had their significance in the spread of diseases.⁽¹⁷⁾

Large (> 5µm diameter) and small (<5 µm diameter) droplets or aerosols are generated when a person coughs, sneezes, laughs, or talks. Due to gravity larger droplets fall to the ground quickly; therefore, droplet transmission needs close physical proximity of an infected and a susceptible individual. On the other hand, smaller droplets/particles residues of evaporated droplets have a low settling velocity, so they remain in the air for a longer period of time and travel further before entering respiratory tract or contaminate surface. Some studies have shown that aerosols generated from highly virulent pathogens like severe acute respiratory syndrome –coronavirus (SARS-CoV) can travel more than six feet.⁽¹⁸⁾ Touching the contaminated surface with hand might lead to pathogen acquisition and their transfer to eyes, nose or mouth, resulting in new case of infection.⁽¹⁹⁾

Droplets and aerosol in dental setting

When high speed handpiece is used for performing dental procedure, friction between rapidly rotating bur and tooth generates excessive heat which could damage dental tissue leading to pathological changes in dental pulp if used without coolant. Hence, in order to prevent heat gain it is mandatory to use a water coolant while performing dental procedures like tooth preparation, oral prophylaxis and oral surgery.⁽²⁰⁾ However, these water coolants would generate aerosols which when combined with bodily fluids in the oral cavity, such as blood and saliva forms bioaerosols. Thus, bioaerosols are commonly contaminated with viruses, bacteria and fungi, having the potential to float in the air for considerable period of time and be inhaled by dentist or other patients.⁽¹⁸⁾

According to current epidemiological data, COVID-19 has greater transmissibility than MERS-CoV and SARS-CoV. Therefore, modification of standard precaution and infection control regimen targeted towards COVID-19 is essential during this pandemic situation.⁽²¹⁾

Infection control in dental settings

As dental procedures generate large number of droplets and aerosols, the standard protective measures for routine dental care are ineffective to minimize the spread of COVID-19, especially when patients are in the incubation period, or are not aware of their infection or choose to conceal their infection.⁽¹²⁾

There by, following infection control measures have been recommended for dental professionals, particularly considering the fact that aerosols and droplets can be a major mode of transmission.

Patient screening-

Dental professionals should be able to diagnose a suspicious case of COVID-19. At the time of scheduling appointments primary telephone screening can be done to recognize suspected or probable COVID-19 infection. Questions related to primary telephonic screening include the existence of febrile respiratory illness, symptoms such as cough and fever and any travel history to COVID-19 infected regions. A positive response to any of these queries would raise the initial concern and postpone the elective dental care for at least two weeks.⁽¹⁴⁾

- 1) As a routine procedure, clinics are recommended to establish precheck triages to measure and record the temperature of every staff and patient. A contact-free forehead thermometer is strongly recommended for screening. For patient with fever over 100.4°F (or 38°C) and/or signs and symptoms of respiratory disease elective dental treatments should be postponed for at least 2-3 weeks.
- 2) Based on the guidelines of the Centre of Disease Control and Prevention, individual with suspected COVID-19 infection will be seated in a well-ventilated waiting room at least 6 feet away from patients who are not infected.
- 3) It is mandatory for the patient to wear a surgical mask and practice appropriate respiratory hygiene, for example use of a tissue to cover their mouth and nose while coughing or sneezing.
- 4) Medical kits (blood pressure cuffs, thermometers, etc.) can be cleaned and disinfected using 70% ethanol.⁽¹⁴⁾

Dental treatment guidelines

Following guidelines should be considered by dental professional in suspected or confirmed COVID-19 cases:

Hand hygiene

People are now well aware of importance of hand washing to prevent acute respiratory infections. According to WHO, cleaning hands either with Alcohol-Based Hand Rub (ABHR) or water and soap are considered to have same efficiency. Water and soap should be used if hands are visibly soiled with dirt, blood, and/or body fluids; otherwise, ABHRs are recommended. Hand hygiene measures should be undertaken before touching a patient and any aseptic action, and after touching a patient, having contact with body fluid, and touching the surroundings of a patient.⁽¹⁴⁾

Personal protective equipment

While executing dental procedures, the oral microorganism mostly scatter towards the dentist's face, especially in the inner part of the eyes and around the nose, which are important areas for transmission.⁽¹⁸⁾ Hence, personal protective equipment can be considered to form most effective barrier against hazards of aerosols generated from the operative site.

- 1) Protective eyewear and face shields: Evidence suggest that infectious droplets can readily attack the epithelium of human conjunctiva, transferring COVID-19 infection by contact with the mucous membrane lining of the eyes. Therefore, protective glasses or face shield should be used to cover the eyes from aerosols and debris produced throughout dental treatment and should be disinfected in between patient's visits.⁽²²⁾
- 2) Face masks: While operating at a distance of less than 1m from the patient, medical mask (surgical or procedure mask) should be worn.⁽¹⁴⁾ For procedures, where aerosols are generated (using high-speed hand piece, air-water syringe, and ultrasonic scaler), a particulate respirator that is at least as protective as a National Institute for Occupational Safety and Health (NIOSH)-certified N95, European Standard Filtering Face Piece 2 (EU FFP2), or equivalent, should be used. For performing emergency dental treatment inpatients with suspected COVID-19 infection, higher level of respiratory protection such as EU FFP3 respirators conforming to European Standard 149 (EN 149) should be considered.⁽¹⁸⁾

Preprocedural mouth rinse

It is considered as one of the most effective methods of reducing the proportion of microorganism in oral aerosols. Studies have shown that there is a reduction of 68.4% colony-forming units in dental aerosols after use of preprocedural mouth rinse like chlorhexidine (CHX), essential oils and cetylpyridinium chloride (CPC).⁽²³⁾ The effect of preprocedural mouth rinse against COVID-19 is yet to be known, however it has been proven that chlorhexidine rinse is effective against several infectious virus, including human immunodeficiency virus (HIV), herpes simplex virus (HSV), and hepatitis B virus (HBV).⁽¹⁸⁾

Hence, it is recommended that about 0.12% CHX can be used as a preprocedural mouth rinse whereas for patients who develops mucosal irritation or other adverse effects such as tongue stain, 0.05% CPC can be considered as an alternative option.⁽²⁴⁾

Radiographs

In order to prevent coughing or gag reflex at the time of intraoral imaging, extra-oral imaging techniques such as panoramic radiograph or cone-beam computed tomography (CBCT) should be used. If intraoral imaging is required, sensors should be double covered to prevent cross contamination and perforation.⁽¹⁴⁾

Rubber dam isolation

Rubber dam isolation can considerably reduce the generation of saliva and blood-contaminated aerosols or spatter, especially when high-speed handpiece and dental ultrasonic devices are used.⁽¹⁰⁾ When correctly placed, the only source of contamination would be the tooth undergoing

treatment. Cavity preparation done under rubber dam isolation has showed significant reduction in spread of microorganism by 90%. However, one of the limitations of using rubber dam is that it is difficult to use in procedures that requires sub-gingival instrumentation like sub-gingival restoration and sub-gingival crown preparation.⁽¹⁸⁾

Anti-retraction handpiece

Dental procedures done using high speed handpiece without anti-retraction valves might aspirate and expel the debris and fluids. Microbes including bacteria and virus may further contaminate air and water tubes within the dental unit potentially causing cross-infection. Studies have shown that high-speed handpiece with anti-retraction valves can significantly reduce the backflow of oral bacterial and HBV into the tubes of handpiece. Hence, handpiece without anti-retraction valve should be prohibited during pandemic period of COVID-19.⁽¹⁰⁾

Removal/ filter of contaminated air

Contaminated air in procedural areas can be removed/ filtered by various methods. The most commonly employed devices are the inexpensive high volume evacuator (HVE) and the expensive high efficiency particulate arrestor (HEPA) filters.

- 1) HVE filter: It is a suction device that removes air at a rate of up to 2.83m³ per minute. Though, this device should be held at a proper distance (approx. 6-15mm) from dental hand piece it is considered as the easiest way to remove dental aerosols. It could efficiently reduce contamination caused by operating site by 90%. However, one of the disadvantages of HVE is clinicians might face difficulty in single handed dentistry. Although there are modified HVEs in the market to address this limitation.
- 2) HEPA filter: It is an air filtration device which can remove 99.97% of the particles from the operating area measuring up to 0.3micrometer in diameter. However, one of the disadvantages of the filter is that it might become a source of microbes if the retained microorganisms proliferate and enter back into the filtered air. In addition, soiled HEPA filters are difficult to clean and expensive to be replaced.⁽¹⁸⁾

Environmental surface disinfectant

While performing aerosols generating procedures, droplets carrying infective pathogens can be deposited on the surrounding surface. An analysis of 22 studies has shown that human coronavirus such as SARS and MERS can remain on inanimate surface for up to 9 days. Despite this, they can be inactivated by surface disinfectants within one minute. The main ingredients of these surface disinfectants are 62-71% ethanol, 0.5% hydrogen peroxide and 0.1% (1g/L) sodium hypochlorite. After each patient visits, surfaces are cleaned with disinfectant especially in close proximity to operating areas.⁽¹⁸⁾

Other ways to reduce droplet generation in different dental disciplines

Based on the features of different dental disciplines (Table-1), we summarize some strategies that could be implemented in some dental specialties to reduce droplet generation.

Management of medical waste

The medical waste bag consisting of disposable protective equipment after use should be immediately transported to the temporary storage facility of medical center. The autoclavable tools and materials should be cleaned, sterilized, and carefully stored according to the Protocol for the Disinfection and Sterilization of Dental instrument. The medical and domestic waste generated while treating suspected or confirmed COVID-19 cases are considered to be infectious waste. Double layer yellow colored clinical waste bags with a "gooseneck" knot should be used. The surface of the waste bags should be tagged and disposed in compliance with the requirements for management of the medical waste.⁽¹⁴⁾

Post treatment

Many organizations have suggested rotation and reuse strategy, since COVID-19 loses its viability after 72hours. It involves bringing in a set number of N95 masks (minimum 5 as per CDC guidelines) and rotating their use each day so that it can dry for longer period that the virus is no more viable. However, N95 respirators used at the time of aerosols generating procedures or those contaminated with blood or respiratory/nasal secretions or other body fluids from the patients should be discarded.

Teledentistry is a form of telehealth providing a pragmatic approach to assess and record oral health status after treatment in turn improving overall delivery of the oral care. The treatment outcome can be monitored using mobile photography ensuring confidentiality of the patient and also providing educational videos of oral hygiene maintenance for the patient's benefit. Teledentistry not only eliminates the chances of exposure to the virus but also reduces the service cost along with maintaining social distance and helps in patient education. Teledentistry has never gained a stronger foothold in dental practices as it does during these times changing the outlook towards dentistry. Hence, it becomes necessary that the dental health professional accept this fundamental tool and apply to its full potential.⁽⁵⁾

Economic crisis globally and Implementation of infection control measures in resource poor countries

Since COVID has caused economic recession in many countries, the regulatory measures mentioned above can be relatively easy to implement in resource-rich countries. Yet adherence to these guidelines and regulations in poor resources countries such as South Africa etc. is a challenge due to their existing unresolved infrastructure issues such as intermittent lack of electricity and running water, hampering implementation of infection control measures.⁽²⁵⁾

The sharp decline in supply of resources and unplanned unemployment has affected many lives and worsened today's scenario. Thus the situation demands to adopt minimally invasive dentistry (Table 2), since they are cost friendly and doesn't require multiple sittings, particularly in developing countries, where standard routine dental protocol is difficult due to poor economic status, lack of availability of skilled and experienced dental health care professionals and logistics.⁽²⁶⁾

The measures that can be undertaken in resource poor countries where there is particular lack of personal protective equipment availability are as follows:

- 1) Simple, inexpensive, reliable no-touch electronic thermometers (minimum) two should be available in order to check the temperature of all the patients, accompanying person (if any) and administrative staff at the entrance of the clinic.
- 2) Local production of optimally three layered cloth masks that could be easily washed sterilized and reused, according to standard guidelines can be used.
- 3) A face shield fabricated from a transparent plastic frame should be worn over the mask.
- 4) If disposable plastic gowns are not accessible, these can be made using thin, plastic bags by cutting holes at the top for the head, and laterally for the arms. After each session such materials should be aseptically disposed of.
- 5) Aerosols generating procedures should be replaced as far as possible with hand instrumentations as per the standard guidelines of local/regional dental advisory bodies
- 6) Air conditioning systems in clinics/reception areas should be effective and efficient for good ventilation. Open all the windows in clinics/ reception area where air conditioning may not be available.
- 7) Unnecessary materials such as newspaper, magazine, book racks which might act as a vector of infection transmission (fomites) should be removed from the clinic and the reception area for easy maintenance and disinfection

2. Summary

The world is going through uncommon crisis causing turmoil in all the countries globally. The health organization has not dealt with such a catastrophe in decades. Dental practitioners, like all other specialties, are affected and experiencing challenges in their routine work and daily living making it imperative to understand the implications of potential transmission of virus in clinical setup in order to identify and rectify negligence in daily practice. The dentist should keep themselves updated with any new information regarding this disease and accordingly educate the public to prevent panic while promoting the health and well-being of patients during these challenging times.

Along with standard precautions, incorporation of special precautions in to practice could prevent transmission of disease from asymptomatic carrier. These precautions not only help in controlling the transmission of the disease but can also serve as a guide for management of other respiratory disease.

3. Conflict of interest

The authors have explicitly denied any conflicts of interest related to this article.

References

- [1] Pradhan D, Biswasroy P, Ghosh G, Rath G. A review of current interventions for COVID-19 prevention. Archives of medical research. 2020;
- [2] Gambhir RS, Dhaliwal JS, Aggarwal A, Anand S, Anand V, Bhangu AK. COVID-19: A SURVEY ON KNOWLEDGE, AWARENESS AND HYGIENE PRACTICES AMONG DENTAL HEALTH PROFESSIONALS IN AN INDIAN SCENARIO. Roczniki Państwowego Zakładu Higieny. 2020;71.
- [3] Sharif S, Amin F, Hafiz M, Benzel E, Peev NA, Dahlan RH, et al. COVID 19-Depression and Neurosurgeons. World Neurosurgery. 2020;
- [4] Kadam A, Karjodkar F, Sansare K, Vinay V. Covid 19-Facts And Its Infection Control Measures For Dentists.
- [5] Bhanushali P, Katge F, Deshpande S, Chimata VK, Shetty S, Pradhan D. COVID-19: Changing Trends and Its Impact on Future of Dentistry. International Journal of Dentistry. 2020;2020.
- [6] Zemouri C, de Soet H, Crielaard W, Laheij A. A scoping review on bio-aerosols in healthcare and the dental environment. PloS one. 2017;12(5):e0178007.
- [7] Blijnaut E, Nemetandani S, Samaranayake L. Strategic implementation of dental infection control in resource-poor jurisdictions during COVID-19 pandemic: a perspective from South Africa. Acta Odontologica Scandinavica. 2020;1-4.
- [8] Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus disease 19 (COVID-19): implications for clinical dental care. Journal of endodontics. 2020;
- [9] Balaji S. COVID-19—Future of dentistry. Indian Journal of Dental Research. 2020;31(2):167-8.
- [10] Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. International Journal of Oral Science. 2020;12(1):1-6.
- [11] Zhou P, Yang X-L, Wang X-G, Hu B, Zhang L, Zhang W, et al. Discovery of a novel coronavirus associated with the recent pneumonia outbreak in humans and its potential bat origin. BioRxiv. 2020;
- [12] Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. Journal of Dental Research. 2020;99(5):481-7.
- [13] Giacomelli A, Pezzati L, Conti F, Bernacchia D, Siano M, Oreni L. Self-reported olfactory and taste disorders in SARS-CoV-2 patients: a cross-sectional study [published online March 26, 2020]. Clin Infect Dis.
- [14] Fini MB. What dentists need to know about COVID-19. Oral Oncology. 2020;104741.
- [15] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The lancet. 2020;395(10223):497-506.
- [16] Belser JA, Rota PA, Tumpey TM. Ocular tropism of respiratory viruses. Microbiology and Molecular Biology Reviews. 2013;77(1):144-56.
- [17] Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and

- their inactivation with biocidal agents. *Journal of Hospital Infection*. 2020 Mar 1;104(3):246–51.
- [18] Ge Z, Yang L, Xia J, Fu X, Zhang Y. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *Journal of Zhejiang University-SCIENCE B*. 2020;1–8.
- [19] Otter JA, Yezli S, Salkeld JAG, French GL. Evidence that contaminated surfaces contribute to the transmission of hospital pathogens and an overview of strategies to address contaminated surfaces in hospital settings. *American Journal of Infection Control*. 2013 May 1;41(5, Supplement):S6–11.
- [20] I FR. Effect of cooling water temperature on the temperature changes in pulp chamber and at handpiece head during high-speed tooth preparation. *Restor Dent Endod*. 2019;44(1):3–3.
- [21] Chen J. Pathogenicity and transmissibility of 2019-nCoV—A quick overview and comparison with other emerging viruses. *Microbes and Infection*. 2020 Mar 1;22(2):69–71.
- [22] Lu C, Liu X, Jia Z. 2019-nCoV transmission through the ocular surface must not be ignored. *Lancet*. 2020;395(10224):e39.
- [23] Marui VC, Souto MLS, Rovai ES, Romito GA, Chambrone L, Pannuti CM. Efficacy of preprocedural mouthrinses in the reduction of microorganisms in aerosol: A systematic review. *The Journal of the American Dental Association*. 2019 Dec 1;150(12):1015-1026.e1.
- [24] Feres M, Figueiredo LC, Faveri M, Stewart B, de Vizio W. The Effectiveness of a Preprocedural Mouthrinse Containing Cetylpyridinium Chloride in Reducing Bacteria in the Dental Office. *The Journal of the American Dental Association*. 2010 Apr 1;141(4):415–22.
- [25] Blignaut E, Nmutandani S, Samaranayake L. Strategic implementation of dental infection control in resource-poor jurisdictions during COVID-19 pandemic: a perspective from South Africa. *Acta Odontologica Scandinavica*. 2020;1–4.
- [26] Garcia Batista ITDCT. The Importance of Minimal Intervention Dentistry after the COVID-19 Pandemic: A Look to the Future. *Global Journal of Medical Research* [Internet]. 2020; Available from: <https://medicalresearchjournal.org/index.php/GJMR/article/view/2200>
- [27] World Health Organization, Coronavirus disease 2019 COVID-19 situation report <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports> Accessed on 19/09/2020
- [28] Ministry of Health and Family Welfare, Government of India (home page on the internet) available at: <https://www.mohfw.gov.in/> Accessed on 19/09/2020