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COVID – 19 AND DENTISTRY – ITS IMPACT AND PREVENTIVE MEASURES

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ABSTRACT

The 2019 coronavirus disease outbreak (COVID-19) has quickly evolved into a large pandemic, causing a public health and economic crisis. This is a new virus distinct from SARS-CoV and MERS-CoV, with the most likely origin being the chinese horseshoe bats. The transmission takes place primarily through spreading droplets or contact routes. The threat of transmission of infection between dental health care personnel (DHCP) and patients can be very significant based on the characteristics of the dental settings. This article provides a brief description of the virus structure, transmission modes and clinical characteristics of COVID-19 disease. The purpose of this article is to recommend strategies for infection control and patient management protocols to provide optimum dental care while simultaneously preventing nosocomial infection in dental settings.

KEYWORDS: Coronavirus, COVID 19, Dental health care personnel, Prevent Infection

INTRODUCTION

In humans, several corona viruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered corona virus causes corona virus disease COVID-19[1]. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. SARS-CoV is the seventh member of the family of coronaviruses that infect humans. It is a virus belonging to the subgenus sarbecovirus, Orthocoronavirinae subfamily. It is an enveloped positive-stranded RNA virus (corona is the Latin term for crown). COVID-19 is now a pandemic affecting many countries globally.[2] The most common symptoms of COVID-19 are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell or a rash on skin or discoloration of fingers or toes. These symptoms are usually mild and begin gradually. Some people become infected but only have very mild symptoms. Most people (about 80%) recover from the disease without needing hospital treatment. However, anyone can catch COVID-19 and become seriously ill. Some reports have indicated that people with no symptoms can transmit the virus. It is not yet known how often it happens. WHO is assessing ongoing research on the topic.[3]

IMPACT ON DENTISTRY

COVID-19 has had a deplorable impact on the dentistry, and with the pandemic still on the growth curve, and it is difficult to ascertain the extent and severity of its long-term impact at this point of time. Practicing is a challenge as most of the practices including dental colleges and teaching institutions are not compatible with government norms and regulations on COVID-19. The fraternity needs to be very careful when it comes to practicing dentistry in this environment as even a small slip in following protocols and taking precautions can turn out to be very expensive. With the majority of the practices in India failing to adhere to strict hygiene protocol, sanitization and sterilization at dental practices are widely absent, further increasing the risks in performing emergency dental procedures.

The professional future of dental practitioners and the sustenance of their practices is a serious concern. Clinic rentals have to be accounted for every month even though there have been no revenues, causing a huge socio-economic impact. The practice of dentistry involves the use of rotary dental and surgical instruments, such as handpieces or ultrasonic scalers and air-water syringes. These instruments create a visible spray that can contain particle droplets of water, saliva, blood, microorganisms, and other debris. There are currently no data available to assess the risk of SARS-CoV-2 transmission during dental practice.[4]

Dentistry today needs a complete structural change to prevent doctors as well as patients from getting infected. Communication has become extremely important in an era of information overload from various sources. Communication and education are required at different levels – between dentists, between dentists and allied health care professionals, and communication to patients and communities. Dentists need to find the right way of articulating

knowledge and information to prevent fear-mongering amongst patients, and create awareness by being honest and transparent.[5]

Also, there is a need for tele mentoring in dentistry to limit panic and fear and communicate facts. use the Phone Advice Line Tool for Possible COVID-19 patients. If possible, delay dental care until the patient has ended isolation or quarantine.[6] Practitioners are adapting to the idea of tele dentistry globally which can be incredibly useful for triaging and will also reduce unnecessary face-to-face time with patients. This model, if adopted in India, can help save time, effort and money significantly – providing emergency dental access to the masses. Request that the patient limit the number of visitors accompanying him or her to the dental appointment to only those people who are necessary. Post visual alerts (e.g., signs, posters) at the entrance and in strategic places (e.g., waiting areas, elevators, break rooms) to provide instructions (in appropriate languages) about hand hygiene and respiratory hygiene and cough etiquette. Remove toys, magazines, and other frequently touched objects from waiting room that cannot be regularly cleaned and disinfected. Educate patients, visitors, and DHCP about the importance of performing hand hygiene immediately before and after any contact with their facemask or cloth face covering.[7] Depending on guidance from local and state health departments, testing availability, and how rapidly results are available, facilities can consider implementing pre-admission or pre-procedure diagnostic testing with authorized nucleic acid or antigen detection assays for SARS-CoV-2. Testing results might inform decisions about rescheduling elective procedures or about the need for additional Transmission-Based Precautions when caring for the patient. Limitations of using this testing strategy include obtaining negative results in patients during their incubation period who later become infectious and false negative test results, depending on the test method used.[8]

PREVENTIVE MEASURES FOR PATIENTS MAY OR MAY NOT BE INFECTED WITH COVID -19

Ensure that you have the appropriate amount of personal protective equipment (PPE) and supplies to support your patients. DHCP should apply the guidance found in the Framework for Healthcare Systems Providing Non-COVID-19 Clinical Care. During the COVID-19 Pandemic to determine how and when to resume non-emergency dental care. DHCP should stay informed and regularly consult with the state or local health department for region-specific information and recommendations. Monitor trends in local case counts and deaths, especially for populations at higher risk for severe illness. Contact all patients prior to dental treatment. Dental healthcare delivery requires close physical contact between patients and DHCP. However, when possible, physical distancing (maintaining 6 feet between people) is an important strategy to prevent SARS-CoV-2 transmission.

Employers should select appropriate PPE and provide it to DHCP in accordance with OSHA's PPE standards (29 CFR 1910 Subpart I)external icon. DHCP should wear **a surgical mask, eye protection (goggles or a face shield that covers the front and sides of the face), a gown or protective clothing, and gloves** during procedures likely to generate splashing or spattering of blood or other body fluids. Protective eyewear (e.g., safety glasses, trauma glasses) with gaps There are multiple sequences recommended for donning and doffing PPE. Facilities implementing reuse or extended use of PPE will need to adjust their donning and doffing procedures to accommodate those practices.[9]

- Before entering a patient room or care area:
    1. Perform hand hygiene (wash your hands with soap and water for at least 20 seconds or use a hand sanitizer).
    2. Put on a clean gown or protective clothing that covers personal clothing and skin (e.g., forearms) likely to become soiled with blood, saliva, or other potentially infectious materials.
        - Gowns and protective clothing should be changed if they become soiled.
    3. Put on a surgical mask or respirator.
        - Mask ties should be secured on the crown of the head (top tie) and the base of the neck (bottom tie). If mask has loops, hook them appropriately around your ears.
        - Respirator straps should be placed on the crown of the head (top strap) and the base of the neck (bottom strap). Perform a user seal check each time you put on the respirator.
    4. Put on eye protection (goggles or a face shield that covers the front and sides of the face).
        - Protective eyewear (e.g., safety glasses, trauma glasses) with gaps between glasses and the face likely do not protect eyes from all splashes and sprays.
        - Personal eyeglasses and contact lenses are NOT considered adequate eye protection.
    5. Put on clean non-sterile gloves.
        - Gloves should be changed if they become torn or heavily contaminated.
    6. Enter the patient room or care area.
- After completion of dental care:
    1. Remove gloves.
    2. Remove gown or protective clothing and discard the gown in a dedicated container for waste or linen.
        - Discard disposable gowns after each use.
        - Launder cloth gowns or protective clothing after each use.
    3. Exit the patient room or care area.
    4. Perform hand hygiene (wash your hands with soap and water for at least 20 seconds or use a hand sanitizer).
    5. Remove eye protection.
        - Carefully remove eye protection by grabbing the strap and pulling upwards and away from head. Do not touch the front of the eye protection.
        - Clean and disinfect reusable eye protection according to manufacturer's reprocessing instructions prior to reuse.
        - Discard disposable eye protection after use.
    6. Remove and discard surgical mask or respirator.
        - Do not touch the front of the respirator or mask.
        - Surgical mask: Carefully untie the mask (or unhook from the ears) and pull it away from the face without touching the front.

- Respirator: Remove the bottom strap by touching only the strap and bring it carefully over the head. Grasp the top strap and bring it carefully over the head, and then pull the respirator away from the face without touching the front of the respirator.

7. Perform hand hygiene.

Facemask FDA-cleared surgical masks are preferred in dental settings because they are designed to protect against splashes and sprays and are prioritized for use when such exposures are anticipated, including surgical procedures.

Respirator:

Respirator use must be in the context of a complete respiratory protection program in accordance with OSHA Respiratory Protection standard (29 CFR 1910.134external icon). trained in the proper use of respirators, safe removal and disposal, and medical contraindications to respirator use. Respirators with an exhalation valve are not currently recommended for source control, as they allow unfiltered exhaled breath to escape. If only a respirator with an exhalation valve is available and source control is needed, the exhalation valve should be covered with a facemask that does not interfere with the respirator fit.

Preprocedural mouth rinses (PPMR) and prescription of mouth rinses-There is no published evidence regarding the clinical effectiveness of PPMRs to reduce SARS-CoV-2 viral loads or to prevent transmission. Although SARS-CoV-2 was not studied, PPMRs with an antimicrobial product (chlorhexidine gluconate, essential oils, povidone-iodine or cetylpyridinium chloride) may reduce the level of oral microorganisms in aerosols and spatter generated during dental procedures. The effect of chlorhexidine, which is commonly used for pre-procedural mouth washing in dental practice, has not yet been demonstrated to be capable of eliminating 2019-nCoV. However, the prescription of oxidative agents containing mouth rinses such as 1% hydrogen peroxide or 0.2% povidone is recommended.

Rubber dam isolation

Using rubber dams due to the creation of a barrier in the oral cavity effectively reduces the generation of droplets and aerosol mixed with patient saliva and/or blood in 1 m diameter of the surgical field by 70%. Following the placement of the dam, extra high-volume suction is also required for maximum prevention of aerosol and spatter from spreading. If it is not possible to use rubber dams for any reason, manual tools such as Carisolvs or hand scalers are preferable.

Anti-retraction handpiece

Avoid aerosol generating procedures (see below for definition) whenever possible, including the use of high-speed dental handpieces, air/water syringe, and ultrasonic scalers. Prioritize minimally invasive/atraumatic restorative techniques (hand instruments only). If aerosol generating procedures are necessary for dental care, use four-handed dentistry, high evacuation suction and dental dams to minimize droplet spatter and aerosols. The number of DHCP

present during the procedure should be limited to only those essential for patient care and procedure support. For emergency treatment, anti-retraction handpieces designed with anti-retractive valves can play an effective role in preventing the diffusion and dispersion of droplets and aerosol.

Properly maintain ventilation systems-Select a HEPA air filtration unit based on its Clean Air Delivery Rate (CADR). The CADR is an established performance standard defined by the Association of Home Appliance Manufacturers and reports the system's cubic feet per minute (CFM) rating under as-used conditions. The higher the CADR, the faster the air cleaner will work to remove aerosols from the air. For dental facilities with open floor plans, **to prevent the spread of pathogens** there should be At least 6 feet of space between patient chairs and Physical barriers between patient chairs. Easy-to-clean floor-to-ceiling barriers will enhance effectiveness of portable HEPA air filtration systems. Operatories should be oriented parallel to the direction of airflow if possible. Where feasible, consider patient orientation carefully, placing the patient's head near the return air vents, away from pedestrian corridors, and toward the rear wall when using vestibule-type office layouts.

After a period of non-use, dental equipment may require maintenance and/or repair. Review the manufacturer's instructions for use (IFU) for office closure, period of non-use, and reopening for all equipment and devices. Test sterilizers using a biological indicator with a matching control (i.e., biological indicator and control from same lot number) after a period of non-use prior to reopening per manufacturer's IFU. Place the HEPA unit near the patient's chair, but not behind the DHCP. Ensure the DHCP are not positioned between the unit and the patient's mouth. Position the unit to ensure that it does not pull air into or past the breathing zone of the DHCP.

Consider the use of upper-room ultraviolet germicidal irradiation (UVGI) as an adjunct to higher ventilation and air cleaning rates.

CDC does not provide guidance on the decontamination of building heating, ventilation, and air conditioning (HVAC) systems potentially exposed to SARS-CoV-2. To date, CDC has not identified confirmatory evidence to demonstrate that viable virus is contaminating these systems. CDC provides the following recommendations for proper maintenance of ventilation systems and patient placement and volume strategies in dental settings.

Alternative disinfection methods-The efficacy of alternative disinfection methods, such as ultrasonic waves, high intensity UV radiation, and LED blue light against SARS-CoV-2 virus is not known. EPA does not routinely review the safety or efficacy of pesticidal devices, such as UV lights, LED lights, or ultrasonic devices. Therefore, EPA cannot confirm whether, or under what circumstances, such products might be effective against the spread of COVID-19. EPA only recommends use of the surface disinfectants identified on List Nexternal icon against the virus that causes COVID-19.

Management of medical waste

Reusable tools and equipment must be properly pre-treated, cleaned, sterilized, and properly stored until the next use. Dental waste resulting from the treatment of suspected or confirmed 2019-nCoV patients is considered medically infectious waste that must be strictly disposed of in accordance with the official instructions using double-layer yellow medical waste package bags and "gooseneck" ligation.[10,12]

COVID-19 is caused by a virus, so antibiotics do not work. Antibiotics should not be used as a means of prevention or treatment of COVID-19. COVID-19 is caused by a virus, so antibiotics do not work. Antibiotics should not be used as a means of prevention or treatment of COVID-19. The coming together of dentistry and medicine, pharma and IT in the country will make a huge positive impact in providing essential, acute emergency dental services to the masses.[10,11,12]

IF PATIENT WITH COVID -19 SEEKS DENTAL TREATMENT

If a patient arrives and is suspected or confirmed to have COVID-19, defer non-emergent dental treatment and take the following actions. If the patient is not manifesting emergency warning signs for COVID-19, send the patient home, and instruct the patient to call his or her primary care provider. If the patient is manifesting emergency warning signs for COVID-19 (for example, has trouble breathing), refer the patient to a medical facility, or call 911 as needed and inform them that the patient may have COVID-19. If emergency dental care is medically necessary for a patient who has, or is suspected of having, COVID-19, DHCP should follow CDC's Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings. Dental treatment should be provided in an individual patient room with a closed door. Limit transport and movement of the patient outside of the room to medically essential purposes Consider scheduling the patient at the end of the day. Do not schedule any other patients at that time.[14]

Conclusion - Dentists can play a significant role in disrupting the transmission chain, thereby reducing the incidence of disease by simply postponing all non-emergency dental care for all patients. Dental professionals must be fully aware of 2019-nCoV spreading modalities, how to identify patients with this infection, and, most importantly, self-protection considerations. The government should come forward to collaborate with the dental and medical fraternity to ensure dentists get all the help they need to tide through these extraordinary circumstances. CDC has developed a framework for healthcare personnel and healthcare systems for delivery of non-emergent care during the COVID-19 pandemic. Patients should wear a facemask or cloth face covering to contain secretions during transport. If patients cannot tolerate a facemask or cloth face covering or one is not available, they should use tissues to cover their mouth and nose while out of their room or care area.[12] A higher rate of virus exposure because of occupational commitments in health care workers is considered a key factor associated with the increased risk of infection.

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