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Covid-19 pandemic and it's impact on dentistry

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Abstract

The epidemic of coronavirus disease 2019 (COVID-19), originating in Wuhan, China, has become a major public health challenge for all the countries in the world. The person-to-person transmission routes of 2019-nCoV included direct transmission, such as cough, sneeze, droplet inhalation transmission, and contact transmission, such as the contact with oral, nasal, and eye mucous membranes. 2019-nCoV can also be transmitted through the saliva, and the fetal–oral routes may also be a potential person-to-person transmission route. In the dental settings there is high risk for transmission of infection between patient and the doctor. This article, based on our experience and relevant guidelines and research, introduces essential knowledge about COVID-19 and nosocomial infection in dental settings and provides recommended management protocols for dental practitioners and students in (potentially) affected areas.

Keywords: Covid 19, Dentistry, Transmission

Introduction

An emergent pneumonia outbreak originated in Wuhan City, in the late December 2019. The pneumonia infection has rapidly spread from Wuhan to most other provinces and other 24 countries. World Health Organization declared a public health emergency of international concern over this global pneumonia outbreak on 30th January 2020 [1]. The infectious agent of this viral pneumonia happening in Wuhan was finally identified as a novel coronavirus (2019-nCOV), the seventh member of the family of corona viruses that infect humans[2]. The novel coronavirus was initially named 2019-nCoV and officially as severe acute respiratory syndrome coronavirus 2 (SARSCoV-2). Given the widespread transmission of SARS-CoV-2, healthcare providers are at an increased risk of contracting the infection and becoming potential carriers of the disease. According to Occupational Safety and Health Administration (OSHA), dental health care personnel (DHCP) are placed in very

high exposure risk category as dentists work in close proximity to the patient's oral cavity. Also, dental procedures involve the use of rotary instruments such as hand pieces and scalers, which generate aerosols. [3]

Etiology of Covid 19

SARS-CoV-2 is the seventh member of the family of coronaviruses that infect humans. Although similar to some betacoronaviruses, it is distinct from SARS-CoV and MERSCoV. It is a novel virus belonging to the subgenus sarbecovirus, Orthocoronavirinae subfamily, with Chinese horseshoe bats (Rhinolophussinicus) being the most common origin. It is an enveloped positive-stranded RNA virus with a diameter of 60–140 nm, spherical or elliptical in shape, and pleomorphic that shows a crown-like appearance under an electron microscope (coronam is the Latin term for crown)[4].

Transmission of corona viruses& incubation period

The common transmission routes of novel coronavirus include direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and eye mucous membranes)(xianpeng 2020)[1]Although patients with symptomatic COVID-19 have been the main source of transmission, recent observations suggest that asymptomatic patients and patients in their incubation period are also carriers of SARS-CoV-2 [5]studies have shown that respiratory viruses can be transmitted from person to person through direct or indirect contact, or through coarse or small droplets, and 2019-nCoV can also be transmitted directly or indirectly through saliva[6] Transmission through ocular surfaces must not be ignored[7]. Study conducted in 88 confirmed cases showed incubation period of 6.4 days ranging from 2.1 to 11.1 days[8]

Transmission in dentistry

Transmission of the virus in dentistry can occur by airborne spread, contact spread, contaminated surface spread it can also spread from person to person by droplets evidence suggests spread through fomites. Dental procedures produce aerosols and droplets that are contaminated with virus. Dental procedures involve use of high speed handpiece which involve generation of large amount of aerosols mixed with patient's saliva thus there is a high potential of spread of covid 19 through droplets and aerosols in dental clinics. A dental professional's frequent direct or indirect contact with human fluids, patient materials, and contaminated dental instruments or environmental surfaces makes a possible route to the spread of viruses . In addition, dental professionals and other patients have likely contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing microorganisms generated from an infected individual and propelled a short distance by coughing and talking without a mask. Dental practices derived droplets and aerosols from infected patients, which likely contaminate the whole surface in dental offices.

Dental setup

Dental professions DSCH (Dental hygienist, dental receptionist, dental assistant) should be aware of how covid 19 spreads and how to identify a suspected case of covid 19 and measures to be taken to prevent the spread during the dental practice[9].

In the covid 19 pandemic situation telephonic triage for the patients is very helpful who need dental care and medical care. The practice of using videoconferencing technologies to diagnose and provide advice about treatment over a distance also called as "Teledentistry" use of latest technologies like teleconsultation, teleeducation, telemonitoring and telesurgery. Helps to provide dental care at distant places.

- Telephones screen all patients for symptoms consistent with COVID-19. If the patient reports symptoms of COVID-19, avoid non-emergent dental

care and use the Phone Advice Line Tool for Possible COVID-19 patients. If possible, delay dental care until the patient has ended isolation or quarantine.

- Telephones triage all patients in need of dental care. Assess the patient's dental condition and determine whether the patient needs to be seen in the dental setting. Use teledentistry options as alternatives to in-office care.
- Request that the patient limit the number of visitors accompanying him or her to the dental appointment to only those people who are necessary [10.]

What constitutes dental emergency? ADA has given information on what constitutes dental emergency

Dental Emergencies: Uncontrolled bleeding, Cellulitis or a diffuse soft tissue bacterial infection with intraoral or extra oral swelling that potentially compromises the patient's airway, Trauma involving facial bones, potentially compromising the patient's airway.

Urgent dental care: Severe dental pain from pulpal inflammation, Pericoronitis or third molar pain, surgical postoperative osteitis dry socket pain, Abscess or localized bacterial infection resulting in localized pain and swelling, Tooth fracture resulting in pain or causing soft tissue trauma, Dental trauma with avulsion/luxation, Dental treatment required prior to critical medical procedures, Final crown/bridge cementation if the temporary restoration is lost, broken, or causes gingival irritation, Biopsy of abnormal tissue.

Other urgent dental care: Extensive dental caries or defective restorations causing pain, Manage with interim restorative techniques when possible (silver diamine fluoride, glass ionomers), Suture removal, Denture adjustment on radiation/ oncology patients, Denture adjustments or repairs when function impeded, Replacing temporary filling on endo-access openings in patients experiencing pain, Snipping or adjustment of an orthodontic wire or appliances piercing or ulcerating the oral mucosa[11]

If a patient is in need of dental care then following questions needs to be asked. The body temperature of the patient should be measured in the first place. A contact-free forehead thermometer is strongly recommended for the screening. A questionnaire should be used to screen patients with potential infection of 2019-nCoV before they could be led to the dental chair-side. These questions should include the following: (1) Do you have fever or experience fever within the past 14 days? (2) Have you experienced a recent onset of respiratory problems, such as a cough or difficulty in breathing within the past 14 days? (3) Have you, within the past 14 days, traveled to Wuhan city and its surrounding areas, or visited the neighborhood with documented 2019-nCoV transmission? (4) Have you come into contact with a patient with confirmed 2019- nCoV infection within the past 14 days? (5) Have you come into contact with people who come from Wuhan city and its surrounding areas, or people from the neighborhood with recent documented fever or respiratory problems within the past 14 days? (6) Are there at least two people with documented experience of fever or respiratory problems within the last 14 days having close contact with you? (7) Have you recently participated in any gathering, meetings, or had close contact with many unacquainted people? If a patient replies "yes" to any of the screening questions, and his/her body temperature is below 37.3 °C, the dentist can defer the treatment until 14 days after the exposure event. The patient should be instructed to self-quarantine at home and report any fever experience or flu-like syndrome to the local health department. If a patient replies "yes" to any of the screening questions, and his/her body temperature is no less than 37.3 °C, the patient should be immediately quarantined, and the dental professionals should report to

the infection control department of the hospital or the local health department. If a patient replies “no” to all the screening questions, and his/her body temperature is below 37.3 °C, the dentist can treat the patient with extraprotection measures, and avoids spatter or aerosol-generating procedures to the best. If a patient replies “no” to all the screening questions, but his/her body temperature is no less than 37.3 °C, the patient should be referred to the fever clinics or special clinics for COVID-19 for further medical care. Management of dental patient during covid 19 has been shown in figure no 1.

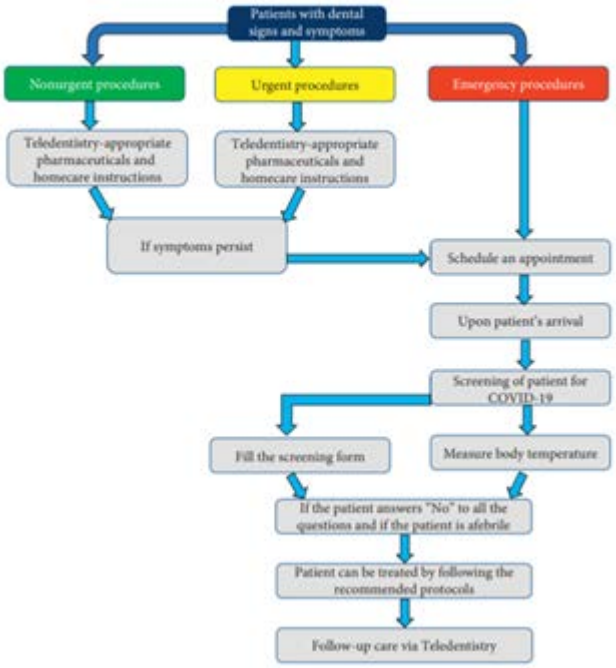

Fig 1: Management of dental patients during covid 19[3]

Waiting room

Post visual alerts icon (e.g., signs, posters) at the entrance and in strategic places (e.g., waiting areas, elevators, cafeterias) to provide patients with instructions (in appropriate languages) about hand hygiene, respiratory hygiene, and cough etiquette. Instructions should include how to use tissues to cover nose and mouth when coughing or sneezing, to dispose of tissues and contaminated items in waste receptacles, and how and when to perform hand hygiene. Provide supplies for respiratory hygiene and cough etiquette, including alcohol-based hand rub (ABHR) with 60-95% alcohol, tissues, and no-touch receptacles for disposal, at entrances, waiting rooms, and patient check-ins.. Arrangements should be made so that social distancing atleast 6 feet will be maintained.[12]

Hand hygiene

CDC recommends using ABHR with 60-95% alcohol. Hands should be washed with soap and water for at least 20 seconds when visibly soiled, before eating, and after using the restroom. Oral professionals should wash their hands before patient examination, before & after dental procedures, after touching the surroundings and equipment without disinfection, and after touching the oral mucosa, damaged skin or wound, blood, body fluid, secretion, and excreta. More caution should be taken for the dental professionals to avoid touching their own eyes, mouth, and nose.

Personal protective measures for dental professionals

Based on the possibility of the spread of 2019-nCoV infection: (1) Primary protection (standard protection for staff in clinical settings). Wearing disposable working cap, disposable surgical mask, and working clothes (white coat), using protective goggles or face shield, and disposable latex gloves or nitrile gloves if necessary. (2) Secondary protection (advanced protection for dental professionals). Wearing disposable doctor cap, disposable surgical mask, protective goggles, face shield, and working clothes (white coat) with disposable isolation clothing or surgical clothes outside, and disposable latex gloves. (3) Tertiary protection (strengthened protection when contact patient with suspected or confirmed 2019-nCoV infection). Although a patient with 2019-nCoV infection is not expected to be treated in the dental clinic, in the unlikely event that this does occur, and the dental professional cannot avoid close contact, special protective outwear is needed. If protective outwear is not available,

working clothes (white coat) with extra disposable protective clothing outside should be worn. In addition, disposable doctor cap, protective goggles, face shield, disposable surgical mask, disposable latex gloves, and impermeable shoe cover should be worn.

Pre examination

Pre procedural mouth rinse agents such as 1% hydrogen peroxide or 0.2% povidone are recommended to reduce the load of oral microbes.

During Emergency procedures

Dental emergencies can occur and exacerbate in a short period and therefore need immediate treatment. Rubber dams and high-volume saliva ejectors can help minimize aerosol or spatter in dental procedures. Furthermore, face shields and goggles are essential with use of higher low-speed drilling with water spray . According to our clinic experience during the outbreak, if a carious tooth is diagnosed with symptomatic irreversible pulpitis, pulp exposure could be made with chemomechanical caries removal under rubber dam isolation and a high-volume saliva ejector after local anesthesia; then, pulp devitalization can be performed to reduce the pain. The filling material can be replaced gently without a devitalizing agent later according to the manufacturer's recommendation.. If the tooth needs to be extracted, absorbable suture is preferred. For patients with facial soft tissue contusion, debridement and suturing should be performed. It is recommended to rinse the wound slowly and use the saliva ejector to avoid spraying. Life-threatening cases with oral and maxillofacial compound injuries should be admitted to the hospital immediately, and chest CT should be prescribed if available to exclude suspected infection because the RT-PCR test, besides time-consuming, needs a laboratory with pan-coronavirus or specific SARS-CoV-2 detection capacity[13] anti-retraction high-speed dental hand piece can significantly reduce the backflow of oral bacteria and HBV into the tubes of the handpiece and dental unit as compared with the handpiece without anti-retraction function. Therefore, the use of dental handpieces without anti-retraction function should be prohibited during the epidemic period of COVID-19. Anti-retraction dental handpiece with specially designed anti-retractive valves or other anti-reflux designs are strongly recommended as an extra preventive measure for crossinfection[14,15]

Post Treatment

Measures such as mopping the floor with 1% sodium hypochlorite and disinfecting waterlines with 0.01% sodium hypochlorite can help reduce the risk of cross infection. All biomedical waste pertaining to patient care should be carefully disposed from time. Teledentistry as a form of Telehealth provides a pragmatic approach to assess and record the oral health status postoperatively and hence improve the overall delivery of oral care.[16] Teledentistry has changed the lookout of dentistry it helps in maintaining the confidentiality of patients, it reduces the patients visit during the pandemic situation, it helps in maintaining the patients records photographically and also helps in maintaining social distance.

Conclusion

The current pandemic situation makes dentistry challenging to maintain balance between the safety of dental professionals as well as to deliver optimum dental care to all the patients. All the health professionals should keep themselves updated regarding information related to the disease. Newer approaches like teledentistry will be very useful to prevent the spread of disease in dental clinics. situation will change from survival to revival and final to new arrival and will give us new face in dentistry. V_R_S only I and U can break this chain.

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