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COVID-19 -A CLINICIAN'S APPROACH

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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 not only China but also countries around the world. The World Health Organization reported that the outbreaks of the novel coronavirus have constituted a public health emergency of international concern. Infection control measures are important to prevent the virus from further spreading and to help control the epidemic situation. Due to the characteristics of dental settings, the risk of cross infection can be high between patients and dental professionals. For dental practices and hospitals in areas that are (potentially) affected with COVID-19, strict and effective infection control protocols are urgently needed. This article, 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: Cross Infection, infection control, personal protective equipment, dental practice management.

INTRODUCTION

The spread of coronavirus (COVID-19) has presented significant challenges for dentistry and medicine, and dental and medical schools, in all affected countries. The arrival of COVID-19 to Europe, a focal point of the pandemic, was not unexpected having originated in Wuhan, China, in late 2019. The speed of response and type of reaction to this disease around the globe have been very variable according to differing healthcare systems, economies and political ideologies**.** Measures remembered lockdowns and forced quarantines on an extraordinary scale. Assortment of mobile phone location data and use of facial recognition technology to track people's movements can't promptly be replicated in other countries, and many would priorities individual rights over this degree of surveillance. China also advised that all healthcare workers use personal protective equipment (PPE), similar to that previously reserved for extremely infectious, irresistible pathogens such as plague and cholera.

Routine dental care was suspended in January 2020 and three months later is starting to get back to normal.[1] Emergency dental care was provided with advice on strict personal protection and measures to reduce and avoid production of droplets and aerosols, use of high-volume aspiration, and others, as had been recommended during the earlier SARS outbreak.[2]

Occupational Health

We are very familiar with occupational health issues in dentistry, such as hepatitis B and hepatitis C, and risk assessment.[3] Many other professions do not have to consider such issues. The New York Times reminded the world that dentistry had the most risk of any profession in relation to COVID-19.[4] There were publications reporting dental professionals to be at high risk of COVID-19 infection due to the close face-to-face contact.[5] Studies suggesting COVID-19 may be airborne through aerosols formed during medical procedures or indirectly through saliva have been published.[6,7]

Infection Control in Dental Settings

Risk of nosocomial infection in dental settings

Dental patients who cough, sneeze, or receive dental treatment including the use of a high-speed hand piece or ultrasonic instruments make their secretions, saliva, or blood aerosolize to the environment. Dental devices could be contaminated with various pathogenic microorganisms after use or become exposed to a contaminated clinical environment. Thereafter, infections can occur through the puncture of sharp instruments or direct contact between mucous membranes and contaminated hands.[8] Because of the novel attributes of dental procedures where a large number of droplets and aerosols could be generated, the standard protective measures in daily clinical work are not powerful enough to prevent the spread of COVID-19, especially when

patients are in the incubation period, are unaware they are infected, or choose to conceal their infection.

Effective Infection Control Protocol

Hand hygiene has been considered the most critical measure for reducing the risk of transmitting microorganism to patients.[9] SARS-CoV-2 can persist on surfaces for a few hours or up to several days, depending on the type of surface, the temperature, or the humidity of the environment.[10] This reinforces the need for good hand hygiene and the significance of thorough disinfection of all surfaces within the dental clinic. The use of personal protective equipment, including masks, gloves, gowns, and goggles or face shields, is recommended to protect skin and mucosa from (potentially) infected blood or secretion. As respiratory droplets are the principle route of SARS-CoV-2 transmission, particulate respirators (e.g., N-95 masks authenticated by the National Institute for Occupational Safety and Health or FFP2-standard masks set by the European Union) are suggested for routine dental practice.

Personal Protective Equipment

The WHO recommends that healthcare workers should wear a medical mask when entering a room where patients suspected, associated or confirmed of being infected with COVID-19 are admitted and in any situation of care provided to a suspected or confirmed case.

Dental drills cause the formation of aerosol and splatter commonly contaminated with bacteria, viruses, fungi and blood.[11] Oral surgery drills also cause aerosol in addition to splatter.[12,13] Aerosols are liquid and solid particles (<50μm diameter) suspended in air for extended periods. Splatter is a mixture of air, water and/or solid substances (50μm to several millimeters diameter). Both are a health risk to the dentistry.

Regular surgical face masks used in dentistry when effectively worn and frequently changed offer around 80% filtration rate. This is good and effective protection for elective dentistry in normal circumstances, knowing that the majority of our patients are healthy. The COVID-19 measures around 120 nm (0.12μm) and aerosol particle sizes extend from 3–100 nm. The use of a FFP3 respirator offers a filtration rate of 99% of all particles measuring up to 0.6μm.[14] This information drove the moral messaging that I was quick to get out, however is of course only a part of the cross-infection control measures that should be utilized to safeguard dental professionals and enable them to proceed with urgent care of their patients.

Recommended Measures During Covid-19 Outbreak

Recommendation for management

In January 2020, the National Health Commission of China added COVID-19 to the category of group B infectious diseases, which consists SARS and highly pathogenic avian influenza. However, it also proposed that all health care workers use protection measures similar to those indicated for group A infections—a category reserved for extremely infectious pathogens, such as cholera and plague.

From that point, in most cities of the mainland of China, only dental emergency cases have been treated when strict implementation of infection prevention and control measures are recommended. Routine dental practices have been suspended until further notification according to the circumstance of epidemics.

Additionally, dentistry-related quality control centers and professional societies in many provinces and cities have put forward their recommendations for dental services during the COVID-19 outbreak, which, as supplementary measures, should be helpful in ensuring the quality of infection control.[15]

Recommendations for Dental Practice

Interim guidance on infection prevention and control during health care is recommended when COVID-19 infection is suspected.[16] Up to now, there has been no consensus on the arrangement of dental services during the epidemic of COVID-19. Dentists should take strict personal protection measures and avoid or minimize operations that can produce droplets or aerosols. The 4-handed technique is helpful for controlling infection. The use of saliva ejectors with low or high volume can reduce the production of droplets and aerosols.[17]

Evaluation of Patients

During the flare-up of COVID-19, dental clinics are recommended to set up pre check triages to measure and record the temperature of every staff and patient as a routine procedure. Pre check staff should ask patients questions about the health status and history of contact or travel.[16] Patients and their bystanders are provided with medical masks and temperature measurement once they enter our clinics. Patients with fever should be registered and referred to assigned hospitals. If a patient has been to epidemic regions within the past 14 days, quarantine for at least 14 days is recommended. In areas where COVID-19 spreads, nonemergency dental practices should be postponed.[8,18] It was reported that dental practice should be postponed at least 1 month for convalescing patients with SARS.[18] It is obscure yet whether the same suggestion should be recommended for patients with COVID-19.

Oral Examination

Preoperative antimicrobial mouth rinse could reduce the number of microbes in the oral cavity.[8] Procedures that are likely to induce coughing should be avoided (if possible) or performed cautiously.[16] Aerosol-generating procedures, for example the use of a 3-way syringe, should be minimized as much as possible. Intraoral x-ray examination is the most common radiographic technique in dental imaging; however, it can stimulate saliva

secretion and coughing.[19] Therefore, extra oral dental radiographies, such as panoramic radiography and cone beam CT, are appropriate alternatives measures during the outbreak of COVID-19.

Treatment of Emergency Cases

Dental emergencies can occur and exacerbate in a short period and therefore require immediate treatment. Rubber dams and high-volume saliva ejectors can be used which helps to minimize aerosol or spatter in dental procedures. Further- more, face shields and goggles are essential with use of high- or low-speed drilling with water spray.[18] According to our clinic experience during the outbreak, if a carious tooth is diagnosed with symptomatic irreversible pulpitis, pulp exposure could be achieved with chemo mechanical caries removal under rubber dam isolation and a high-volume saliva ejector after local anesthesia; then, pulp de-vitalization can be performed to minimize the pain. The filling material can be replaced gently without a devitalizing agent later based on the manufacturer's recommendation. In patients who had a spontaneous toothache because of a cracked tooth without dental decay, and a high-speed hand piece had to be used to access cavity preparation. Given that the patient wanted to retain the tooth, he/she was scheduled as the last patient in the day to reduce the risk of nosocomial infection. After that, patients could be treated in an isolated and well-ventilated room or negatively pressured rooms if accessible for suspected cases with COVID-19. The treatment planning of tooth fracture, luxation, or avulsion is dependent on the age, the traumatic severity of dental tissue, the development of the apex, and the duration of tooth avulsion.[20] In cases where the tooth should be extracted, absorbable suture is preferred. For patients with facial soft tissue contusion, debridement and suturing ought to be performed. It is recommended to rinse the wound slowly and utilize the saliva ejector to avoid spraying. Life-threatening cases with oral and maxillofacial compound injuries ought to be admitted to the hospital immediately, and chest CT should be recommended if available to exclude suspected infection because the RT-PCR test, besides time-consuming, needs a laboratory with pan-corona- virus or specific SARS-CoV-2 detection capacity.

CONCLUSION

The spread of coronavirus (COVID-19) has presented significant challenges for dentistry and medicine, and dental and medical schools, in all affected countries.

Due to the characteristics of dental settings, the risk of cross infection may be high between dental practitioners and patients. For dental practices and hospitals in countries/regions that are (potentially) influenced with COVID-19, strict and effective infection control protocols are urgently required.

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