

## **Covid 19 – A General Review for Dental Care Provider and Patient**

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### **Abstract:**

The current ongoing public health issue is COVID-19 was first detected in Wuhan, China on 31st December 2019 which now considered as a pandemic by the World Health Organization (WHO) on 11th March 2020. Since dental work is the huge producer of aerosol and droplet which can lead to the spread of COVID-19. So the dental professional can play a major role in the prevention of the spread of COVID-19 from person to person.

**Keywords:** COVID-19, Dental Professional, Airborne Spread, Infection Control Measures

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### **I. Introduction**

Several viral epidemics are recorded like severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002-2003, H1N1 influenza in 2009. The current ongoing public health emergency of international significance is of Novel Corona Virus Infection 2019 (COVID 19). According to the World Health Organization, viral diseases continue to emerge and represent a serious issue to public health. The current ongoing public health issue was first detected with low respiratory infections in Wuhan, China on 31st December, 2019.<sup>(1)</sup> This first case was classified as "Pneumonia of unknown etiology" but in present days the etiology attributed to a novel virus belonging to the coronavirus (CoV) family and declared by the name COVID-19.

In the past two decades, the two additional coronavirus epidemic has occurred that is SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus) and MERS-CoV (Middle East Respiratory Syndrome Coronavirus). SARS-CoV that began in China and other countries with approx. 8000 cases and 800 deaths whereas MERS-CoV in Saudi Arabia with approx. 2500 cases and 800 deaths.

### **EPIDEMIOLOGY:**

The WHO Director-General Dr. Tedros Adhanom Ghebreyesus announced on February 11, 2020, that the disease is caused by new CoV. World Health Organization on March 11, 2020 declares COVID-19 as a pandemic. On April 25, 2020 there have been 2,724,809 confirmed cases of COVID-19, including 187,847 deaths globally, reported to WHO.<sup>(2)</sup> According to the Ministry of Health and Family Welfare, India, on April 25, 2020 there have been 18,953 active cases, 5209 cured/discharged, 779 deaths and 1 migrated<sup>(3)</sup>

### **PATHOGENESIS:**

The genome structure of Coronaviruses is best known among all RNA viruses. Out of total RNA, two-thirds of RNA they have encodes viral polymerase (RdRp), RNA synthesis materials, and two large nonstructural polyproteins which not involved in host response modulation (ORF1a-ORF1b) and the other one-third of the genome encodes four structural proteins spike, envelope, membrane, nucleocapsid, and the other helper proteins.<sup>(4)</sup> In the virus infection, the first step is with Spike Protein which interacts with sensitive human cells. After entering the cell genome it encoding occurs which encodes useful accessory proteins and that protein facilitates the expression of genes and that leads to adaptation of CoVs to their human host.<sup>(5)</sup> The changes in the genomes resulting from recombination, gene exchange, gene insertion, or deletion are frequent among CoVs, and this will take place in future outbreaks.<sup>(6)</sup>

### **DENTAL PROFESSION AND CARE AGAINST COVID-19:**

The mixture of particulate water and solid particles produced when a person coughs or sneezes, or converts water into a fine mist through an aeration device or showerhead is known to be droplet<sup>(7)</sup> whereas an aerosol is a dispersion system in which solid or liquid particles are suspended in a gas medium for a long time, and the particle size of the particles suspended in the gas medium ranges from 0.001µm to more than 100 µm.<sup>(8)</sup> The difference between droplets and aerosols lies in the particle size, mass, and time of suspension.<sup>(9)</sup>

A large number of droplets can be generated due to spraying during the dental procedure, which is transformed into droplet cores and suspended in the air of the dental procedure room in the form of aerosol even the aerator or air motor lead to produce. Both droplets and aerosols may carry microorganisms to cause contamination, posing a potential threat to the health of clinical medical staff and patients.

Dentist work so close to the patient so they need a lot of protection and prevention so that chances of infection spread is less. Dental patients and dentists can have exposed to various microorganism including bacteria, viruses, fungi that lead to infection of the oral cavity and respiratory tract. Dental care setting is a higher risk of COVID-19 due to the specificity of procedure which includes communication face to face with the patient during the procedure, exposure to saliva, blood, and other body fluid. Through inhalation of airborne microorganisms that remain suspended in the air for a long time causes the pathogenic microorganism transmission in dental clinic.<sup>(10)</sup> The presence of infection could be any of these conditions such as direct contact with blood and oral fluid<sup>(11)</sup>, contact with conjunctival, nasal or oral mucosa with droplets and aerosols containing microorganism, or by short distance by coughing and talking without mask<sup>(12,13)</sup>, and indirect contact with the contaminated instrument and/or environmental surfaces<sup>(14)</sup> involved in an infected individual in dental clinics and hospitals, especially during the breakdown of COVID-19.

### **AIRBORNE SPREAD:**

COVID-19 is airborne spread viral infection whereas many of the dental procedures produce aerosol and droplets that are contaminated with virus<sup>(15)</sup> and can lead to the transmission of the COVID-19 in dental clinics and hospitals. Dental devices such as high-speed dental handpiece use high-speed gas to drive the turbine to rotate the instruments and along with that, it produces the water. When this device used in the oral cavity it produces a large amount of aerosol and droplet mixed with the saliva and even blood. The particle of the generated droplet is so small that it can stay in the air for the longer period before they settle on environmental surfaces it might enter the respiratory tract. Thus, droplet and aerosol produced by an infected individual in the dental clinic have the potential to spread COVID-19.

### **CONTACT SPREAD:**

Dentists are frequently contacted with saliva, other body fluids, contaminated dental instruments, and an environmental surface causes a higher risk of microorganism infection. To prevent the spread of infection from patient to patient / from dentist to patient/patient to dentist, the effective infection control measure must be adopted and a recent update strategy and instructions must be followed by all the practitioner, dental clinic, and hospital to prevent and control the spread of COVID-19.

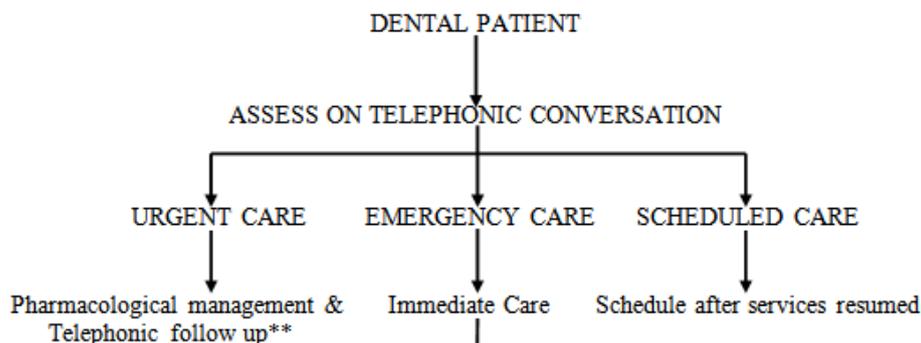
Dental treatment which leads to producing the aerosols and droplets from the infected patient is likely to contaminate the whole surface of the dental clinic which might cause the source of spread of infection of COVID-19. Therefore, the dental clinic and hospital must follow the correct instruction to avoid the spread of infection and must keep clean, dry dental clinic and must disinfect the clinic properly would help to decrease the spread of infection.

### **INFECTION CONTROL:**

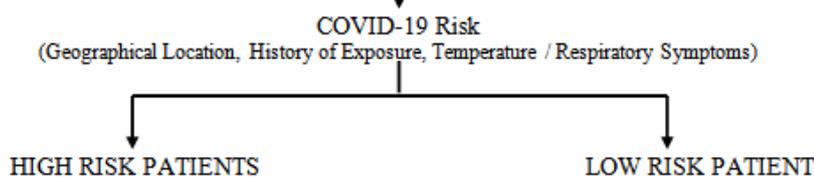
To preventing aerosol transmission is infection source management, increasing ventilation, reducing exposure time and correct use of protective masks. To reduce the aerosol, it is necessary to strengthen the water and air management. Air and surface disinfection and enhanced personnel protection like proper hand washing technique, mask, and utilization of other protective measure can reduce the risk.<sup>(16)</sup> Dental clinic or hospital avoid clinical procedure involving aerosol generation only emergency procedure is to be performed.

**ALGORITHM FOR DENTAL PRACTICE DURING COVID-19 <sup>(17)</sup>**

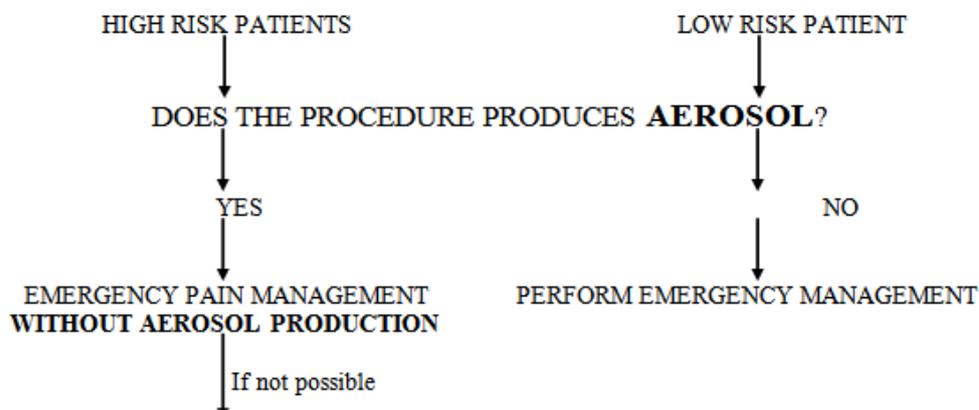
**STEP 1: DENTAL EMERGENCY ASSESSMENT (Telephonic only)**



**STEP 2: COVID-19 SCREENING**



**STEP 3: EMERGENCY DENTAL MANAGEMENT**



Refer to nearby EMERGENCY MEDICAL facility for assessment and management

\*\*If symptom worsen and not managed by pharmacological management then it's should attend immediately as emergency care.

**THE WAY TO PROTECT AGAINST COVID-19:- <sup>(18)</sup>**

- Frequently cleaning your hands with alcohol-based hand rub or washing them with soap and water. By doing this you eliminate viruses that may be on your hands and avoid infection that could occur by then touching your eyes, mouth, and nose.
- Avoid close contact with anyone who is coughing and sneezing. While coughing or sneezing one must use towel or tissue to close your mouth and nose and avoid the spread of infection.
- People of all ages can be infected by the COVID-19. Older people and people with pre-existing medical conditions like as asthma, diabetes and heart disease appear to be more vulnerable to becoming severely ill with the virus. WHO advises all ages to take steps to protect themselves from the virus.
- No, antibiotics do not work against viruses, only bacteria. The COVID-19 is a viral disease and, therefore, antibiotics should not be used as a means of prevention or treatment. However, if you are hospitalized, you may receive antibiotics because bacterial co-infection is possible.
- To date, there is no specific medicine recommended to prevent or treat the COVID-19. However, those infected with the virus should receive appropriate care to relieve and treat symptoms, and those with severe illness should receive optimized supportive care. Some specific treatments are under investigation, and will be

tested through clinical trials. WHO is helping to accelerate research and development efforts with a range of partners.

- Vaccines against pneumonia, such as pneumococcal vaccine and Haemophilus influenza type B (Hib) vaccine, do not provide protection against the COVID-19. The virus is so new and different that it needs its own vaccine. Researchers are trying to develop a vaccine, and WHO is supporting their efforts. Although these vaccines are not effective against COVID-19, vaccination against respiratory illnesses is highly recommended to protect your health.
- Spraying alcohol or chlorine all over your body will not kill viruses that have already entered your body. Spraying such substances can be harmful to clothes or mucous membranes (i.e. eyes, mouth). Be aware that both alcohol and chlorine can be useful to disinfect surfaces, but they need to be used under appropriate recommendations.
- UV lamps should not be used to sterilize hands or other areas of skin as UV radiation can cause skin irritation.
- Hand dryers are not effective in killing the COVID-19 but once your hands are cleaned, you should dry them thoroughly by using paper towels or a warm air dryer.

**ACCORDING TO MINISTER OF HEALTH AND FAMILY WELFARE OF INDIA: - <sup>(19)</sup>**

DOES	DON'T
Maintain personal hygiene and physical distancing.	Shake hands.
Practice frequent hand washing. Wash hands with soap and water or use alcohol-based hand rub. Wash hands even if they are visibly clean.	Have a close contact with anyone, if you're experiencing cough and fever.
Cover your nose and mouth with handkerchief/tissue while sneezing and coughing.	Touch your eyes, nose and mouth.
Throw used tissues into closed bins immediately after use.	Sneeze or cough into palms of your hands.
Maintain a safe distance from persons during interaction, especially with those having flu-like symptoms.	Spit in Public.
Sneeze in the inner side of your elbow and not to cough into the palms of your hands.	Travel unnecessarily, particularly to any affected region.
Take their temperature regularly and check for respiratory symptoms. To see a doctor if you feel unwell (fever, difficulty in breathing and coughing). While visiting doctor, wear a mask/cloth to cover your mouth and nose.	Participate in large gatherings, including sitting in groups at canteens. Visit gyms, clubs and crowded places etc.

**AUTHOR CONTRIBUTION:**

Mithilesh Kumar Singh – Designed the structure of review and wrote the paper  
 Preeti Kumari – Revised the paper and data collection

**CONFLICT OF INTEREST:**

The author declares no conflict of interest.

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