



## Corona (Covid19) Virus: A Global Threat and Dentistry Managements- A Mini-Review

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[Mini-Review Article](#)

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### ABSTRACT

Pneumonia kind of infection caused by coronavirus usually  $\beta$ -type has recently been found in the Wuhan city of China. Strains of this corona are found in bats of genome identity of 96.2% of Bat CoV RaTG13 (Bat type coronavirus). persons affected show symptoms like fever, cough, and sneeze that is likely to spread infections such as droplet inhalant transmission and contact transmissions. A dentist who is in clinical practise is more prone to exposure to face-to-face transmission and through saliva, blood, instruments used by patients, and body fluids. Dentists and patients can expose to infectious microorganisms like both bacteria and viruses especially corona virus-infected patients during dental procedures such as a contaminated instrument or through direct transmissions at dental clinics and hospitals during an outbreak of COVID19. All dental professionals should be aware of how to identify the infected patients and protective measures to be followed in clinics and hospitals to prevent the spread of this disease. Angiotensin-converting enzyme 2(ACE2) is the key receptor used by this virus for spreading especially in oral cavity salivary ducts contain more of this enzyme so in dentistry, saliva is more prone to be exposed by a dentist through droplets or aerosols in which person to person transmissions or through contaminated instruments. Dental professionals play a pre-vital role in the prevention of spreading of the disease and a knowledge guide of precautionary measures that should be mandatory during dental procedures are briefly explained in this article.

**Keywords:** Covid-19; Dental Practise; Dentist; CoV-corona virus.

### Introduction

Coronavirus was highlighted in the 1960's originated from bat-borne viruses like severe acute respiratory syndrome (SARS).<sup>1</sup> They are single-stranded RNA viruses and are classified into four types they are alpha, beta, gamma, and delta viruses. Coronavirus disease 2019 was initially noted at the capital of central china's Hubei province and spread all over China and across the neighbouring countries with increasing global



issues.<sup>1</sup> Globally 155 million cases infected with death inside china are 4,636 and outside of china deaths 3.24 million rapidly spreading around 88 countries.<sup>2</sup> In India, cases are increasing day by day as infected cases are 20.7 million with a death rate of 2,26,000 with a recovery rate of 17million.<sup>2</sup> Genome sequence taken from samples collected at Yunnan province has a similarity of 96.2 percent of bat SARS-CoV-2. still, there are a lot of studies going on in inventing vaccines and discovering of rapid spread and evolution patterns of this type of viruses.<sup>2</sup> Call up by World Health Organization for public health emergency of international regarding this kind of pneumonia unexpected spread on 30<sup>th</sup> January 2020.<sup>2</sup> On 11<sup>th</sup> February 2020, WHO declared this novel viral pneumonia as “Corona Virus Disease (COVID19)”,<sup>3</sup> meanwhile the international Committee on Taxonomy of Viruses (ICTV) commented this novel coronavirus name as “SARS-CoV-2” due to the phylogenetic and taxonomic variations of this type of beta coronavirus. Knowledge and awareness to dental professionals as well as clinicians regarding corona disease diagnosis and management with precautionary measures in dental practise environment are explained precisely in this article.

**Evolution of Covid-19:** Coronaviruses are from the family of Corona viridae, of the order Nidovirales that has large, single, plus-stranded RNA as their genome.<sup>3</sup> Currently, there are four genera of coronaviruses:  $\alpha$ -CoV,  $\beta$ -CoV,  $\gamma$ -CoV, and  $\delta$ -CoV. Most coronavirus can cause infectious diseases in humans and vertebrates.<sup>4</sup> The  $\alpha$ -CoV and  $\beta$ -CoV cause infections in the respiratory, gastrointestinal, and central nervous system of humans and mammals, others  $\gamma$ -CoV and  $\delta$ -CoV mainly infect the birds. According to recent research, similar to SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), SARS-CoV-2 is an animal transmitted disease, especially with *Rhinolophus sinicus* bats variety from china being the most vulnerable for their origination.<sup>4</sup> There is a lot of conspiracy about the coronavirus recently Japanese noble laureate tasuku honjo revealed it is a man-made virus and the united states is also investigating the evolution of this kind of viruses.<sup>4</sup>

**Mode of Transmission:** when the droplet particles of  $>5\mu\text{m}$  in diameter in spite of respiratory droplets, so according to current evidence, through coughing it can spread through the air to nearby persons in cluster transmission of this coronavirus.<sup>5</sup> transmission occurs when a person is in close contact (within 1m) with someone who has a respiratory illness (e.g., coughing or sneezing) and is therefore at risk of having his/her mucosae (mouth and nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets.<sup>6</sup> It can easily occupy the areas and may also occur through fomites in the immediate environment around the infected person. direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person is the capability of this covid-19 virus.<sup>6</sup>

transmission happening informs of tiny droplet transmission as it acts as a carrier presence of microbes within droplet nuclei, which are generally considered to be particles  $<5\text{-}10\mu\text{m}$  in diameter, remain for prolong time at air and spread to others over distances greater than 1.5meter.<sup>7</sup>

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.<sup>8</sup> This epidemiologic feature of COVID-19 has made its control extremely challenging, as it is difficult to identify and quarantine these patients in time, which can result in an accumulation of SARS-CoV-2 in communities and more variety of strains has been mutated in a different part of countries at different environmental conditions. In addition, it remains to be proved whether patients in the recovering phase are a potential source of transmission.<sup>9</sup> Incubation Period. The incubation period of COVID-19 has been estimated at 5 to 6 days on average, but there is evidence that it could be as long as 14 days, which is now the commonly adopted duration for medical observation and quarantine of (potentially) exposed persons.<sup>9</sup>



The common routes of transmission from person to person of this novel coronavirus are through direct contact through coughing or by sneezing.<sup>10</sup> Transmission of the covid-19 virus is not restricted to the lungs, as well as exposure to the eye is also a reason for the virus to enter the body collected from the covid-19 samples of infected patients.<sup>10</sup>

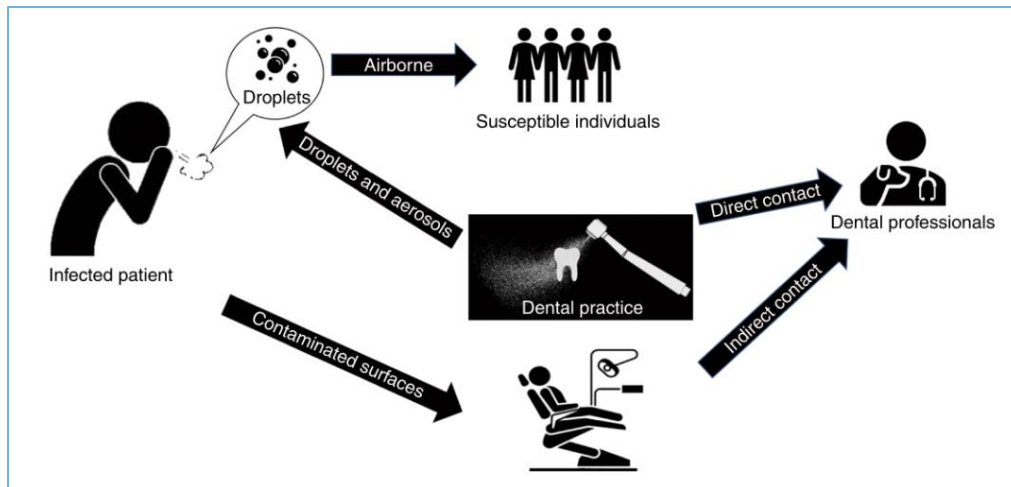
Pneumonic viruses from infected persons through the direct course of small droplets can contaminate the materials and surfaces the person comes in contact with, and coronavirus can also spread by infected persons touching the materials or any surfaces which paved way for super spreading to a cluster of people from the recent studies. In Germany indicates that transmission of the virus may also occur through contact with asymptomatic patients in recent reports.<sup>11</sup>

Studies have suggested that 2019-nCoV may be airborne through aerosols formed during medical procedures. Scientists from China first released information on the viral genome on 11 January 2020.<sup>12</sup> That day the Malaysian Institute for Medical Research (IMR) produced "primers and probes" specific to a SARS-CoV-2 RT-PCR test. Reverse transcription polymerase chain reaction (RT-PCR) first uses reverse transcription to obtain DNA, followed by PCR to amplify that DNA, creating enough to be analysed. RT-PCR can thereby detect SARS-CoV-2, which contains the only RNA. The RT-PCR process generally requires a few hours.<sup>13</sup>

Dental professionals and auxiliaries along with nurses and health care workers in their hospitals as well as the clinical environment, production of cluster droplets contaminated with saliva or blood during treatments at dental clinics. And also contaminated patient's droplets can be transmitted from the handpiece uses pressure to run the motor to rotate at high acceleration along with water.<sup>14</sup> Dental auxiliaries dealing in the patient's oral cavity, are prone to contaminated aerosols will be generated. These aerosols can stay within an extended period on clinical environmental surfaces or enter the respiratory tract of healthy persons.<sup>15</sup> Thus, these coronaviruses have the capability to clusterly transmitted contaminated droplets from infected individuals towards health care centres which will be hotspots for this virus spread.

#### **Guidance of Prevention of Infection at dental Care**

A dentist must be aware of situations regarding identifying covid-19 infected patients and management of such patients during the treatment, how to stop this virus spread of pre-and post-exposure of infected patients at the clinic.<sup>16</sup> we suggest the guidance of prevention of infection during the dental procedures and modification to avoid contaminated droplets on the dental auxiliaries.<sup>16</sup>



**Figure: 1** briefing of spread of covid-19 in healthcare centres

- ❖ **Check in at the entrance to the clinic** examine of patients of symptoms like pyrexia; breathing difficulties; cough and postponed their dental appointment and inform their physician. Prior before they have suffered from above signs it's better to postponed their appointments.<sup>17</sup>
- ❖ **Reschedule treatments** of the patients who have travelled abroad or outside home town shift the appointment at least after 25days not so early.<sup>18</sup>
- ❖ **Register all information regarding incoming patients.**<sup>19</sup>
- ❖ **Construct protection aids made of glass shields** at entrance areas as barrier aid from close contact with potentially infected patients.<sup>20</sup>
- ❖ The **preventive gears against virus must be adopted strictly such as personal protection kits** performed by healthcare professionals during treatments.<sup>21</sup>
- ❖ Make sure **patients rinse their mouth with 1% hydrogen peroxide** solution before procedures.<sup>22</sup>
- ❖ **Fumigate all the areas accessible to patients** regularly, such as doors, bathrooms, and instrns.
- ❖ In case patients showing any symptoms, give them a disposable surgical face mask and isolate them in a separate room.<sup>23</sup>
- ❖ **Safeguard of face by wearing protective gears.**
- ❖ **Avoid touching the eyes, nose, and mouth with unwashed hands.**

Wear a surgical mask and eye protection aids to protect during activities that are likely to generate contaminated droplets of blood-filled droplets, body fluids and secretions from dental treatments.<sup>24</sup>

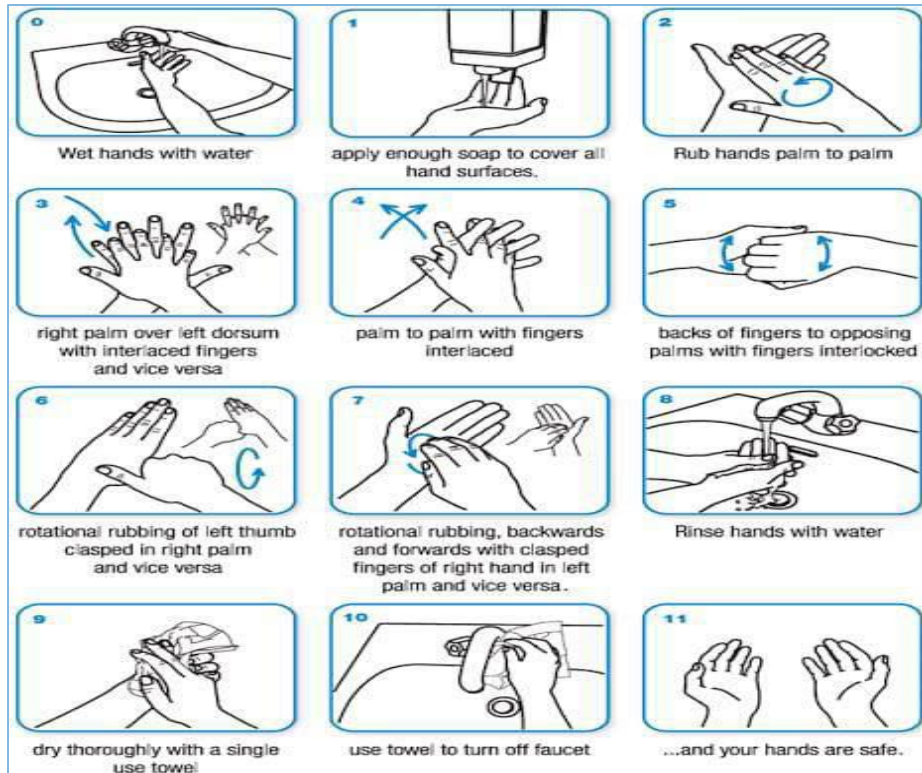
#### **Make sure Wear Gown during procedures<sup>25</sup>**

- Donning and doffing procedures must be strictly followed.
- Remove soiled gown as soon as possible, and dispose properly along with suitable hand hygiene protocols.

#### **Hand Hygiene and washing technique<sup>26</sup>**

**Use soap and water to wash your hands at least for 20 seconds after contact** with patients also, use a hand sanitizer which is alcohol-based (60%) if soap and water are not available. (These recommendations already are part of Standard Precautions.)<sup>26</sup>

Before and after any direct patient contact and between patients, whether or not gloves are worn.<sup>27</sup>



Dental personnel must wear N95 respirators that pavedan improved protection when performing or present for a treatment procedure<sup>28</sup>



### Management of clinical waste<sup>29</sup>

Contaminated clinical wastes such as clinical waste like blood or saliva-filled cotton pellets, extracted tooth, or contaminated materials in accordance with local regulations. Human tissues and laboratory waste associated with specimen processing should also be treated as clinical waste. Dismantle single-use items safely.



### Protection Aid Protocols<sup>30</sup>

#### Health care centres must be fumigated and cleansed properly during this infectious period.

- Safe disposal and handling of instruments and kits used to patients which were contaminated after used to patients.
- Reusable instruments and materials are to be sterilised properly before used to patients.

#### Start-up with training sessions to fellow personnel regarding preventive aids

Train and create awareness to prevent infections from these viruses by learning sessions along with virtual video sessions in series.<sup>30</sup>

#### Vaccines-new tool

Vaccines are a critical new tool in the battle against COVID-19 and it is hugely encouraging to see so many vaccines proving successful and going into development. Working as quickly as they can, scientists from across the world are collaborating and innovating to bring us tests, treatments and vaccines that will collectively save lives and end this pandemic.

Safe and effective vaccines will be a gamechanger: but for the foreseeable future, we must continue wearing masks, physically distancing, and avoiding crowds. Being vaccinated does not mean that we can throw caution to the wind and put ourselves and others at risk, particularly because it is still not clear the degree to which the vaccines can protect not only against disease but also against infection and transmission.<sup>28</sup>

**Conclusion:** This COVID-19 virus was more contagious than SARS-CoV and MERS-CoV due to its cluster spread in the community. By mid-April 2020, health care workers were prone to this disease even after protective gear failed to protect them and further investigations to be done to stop further exposure by them. Emergency patients still go to the dental clinics and hospitals for treatment so modifications regarding manage mental care should be adopted. We have also mentioned in brief about prevention of virus transmission during dental treatment such as precautions taken during entry of patients; during the procedures and after the end of treatment. New approaches such as Teledentistry will help dentists assist patients without adding the risk of cross-infection. The recent state of affairs obligates the need to strike a balance between the safeties of healthcare professionals yet providing optimum dental care to the patients requiring emergency intervention.

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