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A Review of Current Evidence on COVID-19



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ABSTRACT

The coronavirus is rapidly spreading in the world from its origin in Wuhan City of China on 31st December 2019 to the rest of the world. Until May 10th, 2020 around 4,139,743 cases of coronavirus disease and 281,457 deaths and recovered 1,455,921 have been reported. The microscopic appearance of the coronavirus, characterized by the presence of pointed structures on the surface. On 9th January 2020, the WHO declared the discovery a new coronavirus, called 2019-nCoV. On 11th February 2020, the infection was named COVID-19. The infection spread through close contact with infected person. Transmission of COVID-19 via aerosol, fomites, or the fecal-oral route. The virus includes cough and sneezing, due to presence of virus in both saliva and feces of the infected people. The SARS-CoV-2 can bind to human Angiotensin-Converting Enzyme 2 (ACE-2) receptors, which are highly concentrated in salivary glands; this may be a possible explanation for the presence of SARS-CoV-2 in secretory saliva. The social distancing to minimize community spread of the COVID-19, Thus, disinfection of objects and hand washing are essential for prevent the spread of this virus. Preferred clinical samples for establishing the laboratory confirmation of a suspected case include swabs collected from oropharyngeal and nasopharyngeal. There is no special vaccine for this yet, the first step is to ensure adequate isolation to prevent transmission. Only supportive therapy is the treatment strategy followed by health professionals.



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INTRODUCTION

The COVID-19 was intensified from its origin in Wuhan City of Hubei Province of China (December 31st, 2019). The virus is spreading more than 200 countries.¹ Till May 10th, 2020 around 4,139,743 cases of COVID-19 and 281,457 deaths have been reported. India has reported 65,021 cases and 2,123 deaths have been reported till date. The coronavirus defined as includes a range of respiratory viruses, which can present with mild, moderate and severe manifestations and lead to respiratory failure. The name recalls the electron microscopic appearance of the virus, characterized by the presence of pointed structures on the surface, resembling a crown². The WHO declared the discovery a new coronavirus by January 9th, 2020. The WHO had firstly named 2019-nCoV and then officially called SARS-CoV-2, which had never been founded in humans before. On February 11th, 2020 the respiratory disease deriving from SARS-CoV-2 infection was named COVID-19,³ SARS-CoV-2 has an approximated incubation period of 1 to 14 days, which is also the duration of quarantine with medical observation in covid-19 positive patients. COVID-19 has seen a violent and fast expand planetary,⁴ which has led to the statement of a pandemic outbreak of the COVID-19 by the WHO.

NARRATIVE OF COVID-19

The COVID 19 is spherical or pleomorphic, single stranded, enveloped RNA. The virus is from 60 nm to 140 nm in diameter, with pointed structures on the surface on its surface giving it a crown like appearance under the electron microscope, therefore the name coronavirus⁵. Four coronaviruses i.e HKU1, NL63, 229E and OC43 have been in circulation in body, and generally cause mild respiratory disease. There have been two events in the past two decades wherein crossover of animal β coronaviruses to humans has resulted in severe disease.⁶

First case of coronavirus was determine as cold in 1960. Few studied in 2001, 18 cases positive as infected with this virus strain by polymerase chain reaction, same instance was reported in 2002– 2003 when a new coronavirus of the β genera and with origin in bats crossed over to human saliva the intermediary host of palm civet cats in the Guangdong province of China. Corona was treated as simple non-fatal virus till 2002. In 2003, reported the corona to many countries such as Hong Kong, Singapore, United States America, Taiwan and Thailand. In 2004, WHO and centers for disease control and prevention stated as “state

emergency". Some study reported of Hong Kong was identified 50 patient of severe acute respiratory syndrome while 30 of them were confirmed as corona virus infected. in 2012, the Middle East Respiratory Syndrome coronavirus (MERS-CoV), also of bat origin, emerged in Saudi Arabia with dromedary camels as the intermediate host and affected 2494 people and caused 858 deaths.^{7,8,9,10}

ORIGIN OF COVID 19

The COVID-19 spread from the Wuhan wholesale seafood market of China. On December 31st 2019, China alerted the epidemic to the WHO. On 7th January the virus was identified as a coronavirus.¹¹ The samples from the Wuhan seafood market tested positive, signifying that the virus originated from there.¹² The first mortal case was reported on 11th Jan 2020. Corona virus infected in other provinces of China were reported in people who were returning from Wuhan. Cases of COVID-19 in countries outside China were reported in those with no history of travel to China suggesting that local people-to-people transmission was occurring in these countries¹³. In fact on the 12th of February, China changed its definition of confirmed cases to include patients with negative pending molecular tests but with clinical, radiologic and epidemiologic features of COVID-19 leading to an increase in cases by 15,000 in a single day¹⁴. It is important to note that while the number of new cases has reduced in China lately, they have increased exponentially in other countries including South Korea, Italy and Iran. India, which had reported only 3 cases till March 2nd, 2020. Many of the contacts of these cases have been quarantined. These numbers are possibly an underestimate of the infected and dead due to limitations of surveillance and testing. Though the SARS-CoV-2 originated from bats, the intermediary animal through which it crossed over to humans is uncertain.

SPREAD OF COVID-19

The infection spread through close (less than 6 ft) contact with corona positive people, there is a potential for transmission of COVID-19 *via* aerosol, fomites, or the fecal-oral route. The virus incorporate cough and sneezing, due to appearance of virus in both saliva and feces of the affected patients.^{15,16} It is known that SARS-CoV-2 can bind to human angiotensin-converting enzyme 2 receptors, which are highly concentrated in salivary glands; this may be a possible explanation for the presence of SARS-CoV-2 in secretory saliva.^{17,18} COVID-19 was replicated in ciliated epithelium that caused cellular damage and infection at infection site. Risk of COVID-19 inhalation transmission is extremely high when performing dental

procedures due to the use of dental instrument, which favors the diffusion of aerosol particles of saliva, blood, and secretions. Given the direct contact transmission, the mucosa of the oral cavity has been recognized as a potentially high-risk route of virus,¹⁹ as well as contaminated hands, which could facilitate virus transmission to patients.

CLINICAL FEATURES OF COVID-19

- Fever, cough, sore throat, headache, fatigue, myalgia and breathlessness, conjunctivitis
- The acute respiratory distress syndrome and multi organ dysfunction.²⁰
- By the end of the first week the disease can progress to pneumonia,²⁰
- Respiratory failure and death.
- Complications witnessed included acute lung injury, Acute Respiratory Distress Syndrome (ARDS), shock and acute kidney injury.
- In addition, abnormal chest X-ray and Computed Tomographic (CT) findings such as ground-glass opacities are typically found in the chest.²⁰
- Severe forms of this disease have a predilection for men with a mean age of 56 years with preexisting chronic illnesses such as hypertension, diabetes, cardiovascular disease and cerebrovascular disease or immunosuppression.

DURATION OF COVID-19

- The median time from onset of symptoms to dyspnea was - 5 days,
- Hospitalization - 7 days and
- ARDS - 8days.
- Recovery started in – 2nd or 3rd week.
- The median duration of hospital stay in those who recovered was -10 days.

PREVENTION OF TRANSMISSION OF COVID-19

The social or physical distancing to minimize community spread of the coronavirus and hand washing are essential for prevent the spread of this virus.²¹ All surfaces that may be touched by the patients should be disinfected with sodium hypochlorite 0.1% or 70% isopropyl alcohol. Use of Personal Protective Equipment (PPE) and respiratory and cough etiquettes. PPE consists of the medical masks or particulate respirators, face shields or goggles, gowns, gloves and shoe covers.^{20,21} Tissue papers should be preferred to drying hands and disposable. the patients who are in home care setups and suspected infection of the virus with mild respiratory symptoms and healthcare workers need to wear masks at all times followed by hand hygiene and correct disposal.²⁰ Particulate respirators (NIOSH-certified N95, EU standard FFP2 or equivalent) should be used by HCWs involved in Aerosol-Generating Procedures (AGPs). Symptomatic patients in the community settings should be discouraged from congregating in public or crowded areas. Information, Education and Communication (IEC) messages should encourage self-deferral and self-containment for patients who are symptomatic. For home care, patients should be placed in a well-ventilated room.²²

DIAGNOSIS OF COVID-19

The clinical samples for establishing the laboratory confirmation of a suspected case include swabs collected from oropharyngeal and nasopharyngeal, using expectorated sputum, Dacron swabs, BAL fluid, endotracheal aspirate and tissue. The sample is to be collected in a sterile container with normal saline which covers the sample; serum samples are collected in pairs in the red cap vials with clot activators during both the acute phase and the convalescent phase of the illness. For the transportation of samples to the laboratory, the swabs should be placed in a commercially available viral transport medium. The guidelines recommend triple packaging of sample.²³

The WHO recommends that the culture of the virus must be done in a BSL-3 laboratory and the RT-PCR be done in a BSL-2 laboratory.^{24,25} While handling specimens of SARS-COV-2, one must ensure that neither the sample nor the HCW is contaminated to minimize any risks and to ensure accuracy of diagnosis. Isolation of SARS-COV-2 can be done in cells lines and the diagnosis has to be confirmed by RT-PCR. The test detects the presence of three genes- *E*, *RdRp* and *N*. This is done in a step-wise process, with the three genes tested in sequence only if the one before is positive.

MANAGEMENT AND VACCINATION OF COVID-19

There is no special vaccine for this yet, the first step is to make sure appropriate isolation or quarantine to intercept carrying to other contacts, patients and healthcare workers. Only supportive therapy is the treatment approach followed by health professionals. Supportive therapy are maintaining hydration and nutrition and controlling fever and cough. Routine use of analgesic and antipyretic, mechanical ventilation as respiratory support and uses of antibiotic in bacterial infections. The usual principles in hypoxic patients, provision of oxygen through nasal prongs, face mask, High Flow Nasal Cannula (HFNC) or non-invasive ventilation is indicated. Chinese guidelines do recommend short term therapy with low-to-moderate dose corticosteroids in COVID-19 ARDS.^{26,27} Ribavirin, Lopinavir & Ritonavir have been used based on the experience with SARS and MERS. In a historical control study in patients with SARS, patients treated with Lopinavir, Ritonavir with ribavirin had better outcomes as compared to those given ribavirin alone.²⁸ More evidence is needed before these drugs are recommended. Other drugs proposed for therapy are arbidol, intravenous immunoglobulin, interferons, chloroquine and plasma of patients recovered from COVID-19.^{29,30,31} Food and Drug Administration (FDA) of America induced Remdesivir, inhibit the multiplication of virus.

CONCLUSION

The pandemic COVID-19 was spreading in human, virus carrying *via* airborne droplets. So avoid any types of activities with infected people and his/her family members. This pandemic has challenged the economic, medical and health infrastructure of the world. According to WHO and ECDC guideline avoid contact with sick person and also avoid the public place as per possible. Still there are not present any remedy or vaccine.

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