

2019 NOVEL CORONAVIRUS

The outbreak of 2019 Novel Coronavirus (2019-nCoV) is still recent, and new knowledge is being discovered daily about the novel virus as well as the disease it causes. The objective of this editorial is to update us on what is known to date about 2019-nCoV.

INTRODUCTION

In December 2019, the outbreak of a new disease began in Wuhan, Hubei Province, China. The causative agent of the new disease outbreak was identified as 2019 novel Coronavirus 2019 (2019-nCoV) and it was named Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). On February 11, 2020, the WHO officially named the new disease - Coronavirus disease 2019 (COVID-19)^{1,2}. Coronaviruses are predominant among different species of animals, such as cats, camels, cattle and bats. However, on rare occasions, some types can be transferred to humans and subsequently spread among people³. Some of the common human coronaviruses are HCoV-229E, HCoV-NL63, HCoV-OC43 and HCoV-HKU1, which cause milder diseases, as well as other types, including Middle East Respiratory Syndrome Coronavirus (MERS-CoV), SARS-CoV and the new SARS-CoV-2, which causes more fatal diseases⁴.

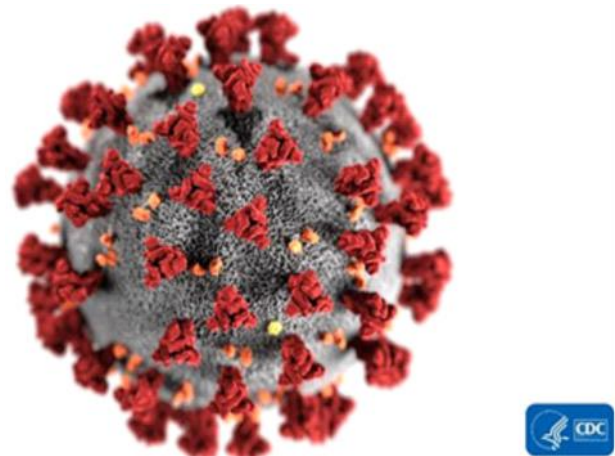
The virus

Coronaviruses (CoVs) (order Nidovirales, family Coronaviridae, and subfamily Coronavirinae) are large, enveloped, positive-sense, single-stranded RNA viruses. Based on genetic and antigenic criteria, CoVs have been organized into three groups: α -CoVs, β -CoVs, and γ -CoVs. SARS-CoV-2 is a beta coronavirus, similar to MERS-CoV and SARS-CoV⁵. The coronaviral genome encodes four major structural proteins: the spike (S) protein, nucleocapsid (N) protein, membrane (M) protein, and envelope (E) protein, all of which are required to produce a structurally complete viral particle⁵.

When viewed under an electron microscope, the ultrastructural morphology of the virus shows spiky projections on its surface, giving it an appearance of a corona around the virion. Hence, the appearance gave it the name "coronavirus".

Source and spread

Coronaviruses primarily infect birds and mammals, but some of them have crossed the animal-human species barrier and progressed to establish zoonotic diseases in humans⁵. The initial victims of the outbreak



of SARS-CoV-2 in Wuhan, China, had some links with seafood and live animal markets; thus, indicating a likely animal-to-human mode of transmission. However, the subsequent transmission of the virus was through human to human spread^{3,7}.

SARS-CoV-2 is primarily spread through human to human transmission through direct contact with respiratory droplets from an infected individual by coughing/sneezing, saliva, or nasal discharge.^{3,8} Eye contact with an infected droplet can also serve as a route of transmission⁹. In addition to droplet transmission, SARS-CoV-2 might also be transmitted via the fecal-oral route.¹⁰ It has been identified that SARS-CoV-2 can survive on surfaces and objects; hence, indirect transmission through fomites is also possible³. The available information indicate that the virus may survive a few hours to days depending on the surface, but no conclusive report yet¹.

Even though infected individuals who are yet to show any symptoms have the potential to spread the virus, transmission occurs mainly from those with symptoms of the disease^{3,8}. Meanwhile, according to the current estimate from the WHO based on currently available data, the incubation period (the period between infection and the onset of symptoms) ranges from 1 – 12.5 days^{3,8}.

Children under two years, older patients, patients with chronic medical conditions, and patients with a weak immune system were identified to be at higher risk of contracting MERS-CoV and SARS-CoV¹¹, and this is also true for SARS-CoV-2. Similar conditions have also been implicated as risks for developing severe illness from the COVID-19 disease².

Symptoms/Clinical presentation

Coronaviruses are a large family of viruses that cause respiratory diseases; some infected persons may be asymptomatic. The severity of COVID-19 may range from mild respiratory diseases such as the common cold to severe respiratory illnesses such as the Novel Coronavirus–Infected Pneumonia (NCIP). The common symptoms include fever, cough, fatigue, and dyspnea (shortness of breath). Other less frequently reported symptoms are headache, sore throat, hemoptysis (coughing up blood) and diarrhea.³

Testing

The CDC has developed a new lab test kit, an rRT-PCR kit, for testing upper and lower respiratory specimens collected from persons who meet the CDC criteria for 2019 n-CoV testing.

The CDC has developed the “criteria to guide for the evaluation of Persons Under Investigation (PUI)”¹², and this is presented in Table 1 below:

Table 1: Criteria to guide the evaluation of persons under investigation for COVID-19

Clinical features	AND	Epidemiologic risk
Fever or signs/symptoms of lower respiratory illness (e.g., cough or shortness of breath)	AND	Any person, including healthcare workers, who has had close contact with a laboratory-confirmed COVID-19 patient or SARS-CoV-2 infected patient within 14 days of symptom onset.
Fever and signs/symptoms of a lower respiratory illness (e.g., cough or shortness of breath)	AND	A history of travel from Hubei Province, China within 14 days of symptom onset
Fever and signs/symptoms of a lower respiratory illness (e.g., cough or shortness of breath) requiring hospitalization	AND	A history of travel from mainland China within 14 days of symptom onset

Treatment

There is currently no specific antiviral treatment for COVID-19 (SARS-CoV-2) infection³; however, a study revealed that Remdesivir and Chloroquine are highly effective in the control of SARS-CoV-2 infection in vitro¹³. However, supportive therapies such as the use of antimicrobials, oxygen therapy, and specific treatment for underlying conditions such as diabetes and kidney failure may reduce the severity of the symptoms and increase the chances of survival.⁵

Prevention

Prevention is better than cure; hence, for all diseases, it is better to avoid getting infected, but in the case of COVID-19, where there is still no known definitive treatment or vaccine, avoiding any exposure to the virus is best. Thus, individuals are advised to imbibe the habits of good hand hygiene and basic protective practices. Some of these include regular hand washing

with either soap and water or alcohol-based hand rub after every contact with people, objects and surfaces. Additionally, everyone is encouraged to refrain from touching the eyes, mouth and nose with unclean hands; maintain a distance of at least a meter from anyone infected with SARS-CoV-2; and cough into a flexed elbow or tissue and ensure that the nose and mouth are covered while doing this. Anyone with respiratory symptoms should use a facemask, inform other people and report their symptoms immediately to a health facility⁸. Health workers should ensure that they practice regular hand washing with either soap and water, or alcohol-based hand rubs after every contact with patients, objects and surfaces in the health facility. They should also ensure strict adherence to standard precautions not just when they are attending to patients but at all times in the health facility¹⁴.

CONCLUSION

COVID-19 is a new disease caused by SARS-COV-2. While much work is still ongoing to learn more if not all about the virus, it is known that it can spread rapidly among humans, can cause respiratory illnesses and other symptoms, and has resulted in many deaths, especially in China, where the outbreak first occurred in December 2019. No vaccine or certified treatment regimen is available yet; therefore, the prompt management of the constitutional symptoms has remained the mainstay of treatment of COVID-19 for now. There is no vaccine known to be effective against SARS-CoV-2; hence, avoiding contact with an infected individual remains the mainstay of prevention and control of COVID-19. Any infected individual or individual with indicative symptoms should avoid spreading the virus and promptly report their symptoms to a healthcare center for early diagnosis and prompt management.

Keywords: 2019 Novel Coronavirus (2019-nCoV), Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), Coronavirus disease 2019 (COVID-19), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Wuhan - China

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