

COVID-19: At a Glance

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ABSTRACT

Viruses belongs to family coronaviridae is pandemic pathogenic in nature. The main species reported are HCoV-NL63 (Human coronavirus NL63), HKU1 (CoV-HKU1), SARS (Severe acute respiratory syndrome related coronavirus), MERS (Middle East respiratory syndrome related coronavirus) or EMC/2012 and COVID-19 (Coronavirus disease,2019). COVID-19 is single RNA stranded with capsid, which cause infectious disease of acute respiratory syndrome and was identified in December 2019 in Wuhan city of China. From man to man this virus spread by small droplets of coughing, sneezing and talking.

It was reported that during infection by endocytosis it enters in cytoplasm and loose its genomic elements which multiply. After 5 days by exocytosis these genomic elements come outside and infect to other persons. Study also found that viral load was highest at symptoms onset and so may have peaked before symptoms developed. Now it is symptomatic as well as non-symptomatic. WHO declared the COVID-19 outbreak a public health emergency of International concern on 30 January, 2020 and a pandemic on 11 March, 2020. Due to change of spike protein structure it regularly going to mutate so no vaccine has completed till now, however multiple affords are in progress to develop a vaccine against COVID-19.

The present study is an informative report at a glance regarding COVID-19.

Keywords: COVID-19, Pandemic, Symptomatic, Endocytosis, Pathogenic.

INTRODUCTION

Viruses are simple, acellular entities. They can reproduce only with in cytoplasm of living cells because they are obligate intracellular parasite. A complex virus particle or virion have one or more molecules of DNA or RNA enclose in a protein coat. Virus morphology has been intensely studied over the past decades, but progress has come from the use of several techniques introduction like electron microscope and X-ray diffraction. These viruses which made of RNA, can mutate rapidly to give rise to new type.

Structure of Virus:

Virus range in size from about 10 to 400nm in diameter. The smallest viruses are a little larger than ribosomes, whereas the pox viruses, which include Vaccinia virus (VACV or VV) are about the same size as the smallest bacteria and can be seen in the light microscope. Most viruses however are too small to be visible in the light microscope and must be viewed with scanning and transmission electron microscope (Fig.1). A virus particle, also called a virion, consists of genes made from DNA or RNA which held within a protective coat of protein called capsid, which also aids in its transfer between host cells. The protein used to build the capsid are called promoters or capsomeres. Some viruses are surrounded by lipid (fat) bubble called envelop, which makes them vulnerable to soap and alcohol.

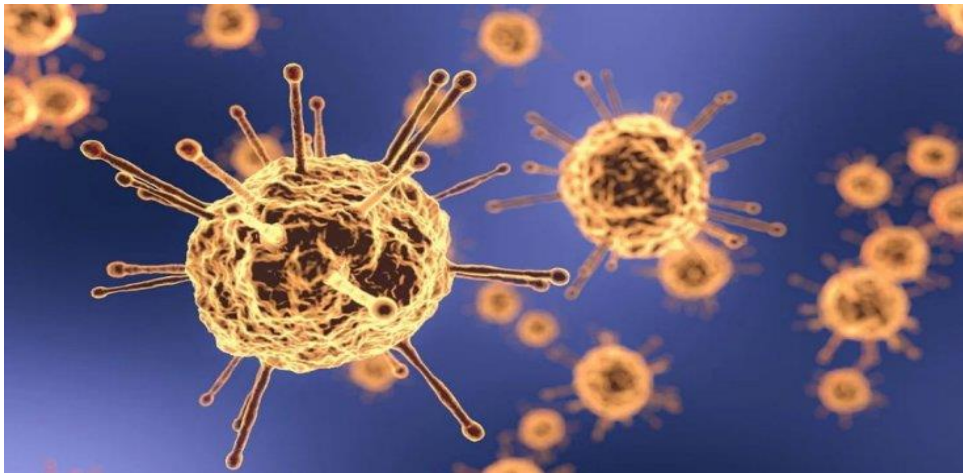


Fig.1. Showing structure of COVID-19 (Ref. ibtimes.sg)

Taxonomy of coronavirus:

Corona is a Latin word which means a white or colored circle or set of concentric circles of light seen around a luminous body (such as the sun or moon) caused by diffraction produced by suspended droplets or occasionally particles of dust. It is a single RNA stranded of genome size 27 Kbp to 31 Kbp, having helical capsid symmetry with the presence of envelop (14 – 16 diameter of helical symmetry (h) and 18 – 160 e (diameter of envelop viron) , which replicate in the cytoplasm of host cell and use host golgi apparatus and endoplasmic reticulum in budding which causes human respiratory infection. Its family is coronaviridae.

Species of coronavirus

It has now five species namely:

1. HCoV-NL63 (Human coronavirus NL63)
2. HKU1 (CoV-HKU1)
3. SARS (Severe acute respiratory syndrome related coronavirus)
4. MERS (Middle East respiratory syndrome related coronavirus) or EMC/2012
5. COVID-19 (Coronavirus disease, 2019) also known as novel coronavirus.

These all species are like nano particles. Human coronavirus NL63 (HCoV-NL63) is a single stranded, positive sense RNA virus which effects moderate upper respiratory tract infection and serve lower respiratory tract infection. Human coronavirus (HKU1) originates from infected mice. In humans infects upper respiratory disease with symptoms of common cold, but can advance to pneumonia and bronchiolitis +ve sense single stranded RNA virus. SARS is Severe acute respiratory syndrome coronavirus. MERS is Middle East respiratory syndrome coronavirus. COVID-19 is a new coronavirus which came in 2019 and also called as novel coronavirus and the previous names were 2019-nCoV and after that SARS-CoV-2.

MATERIALS AND METHODS

The standard method of diagnosis is by real time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab. Chest CT imaging may also be helpful for diagnosis in individuals where there is a high suspicion of infection based on symptoms and risk factors. The virus is primarily spread between people during close contact, most often via small droplets produced by coughing, sneezing and talking. The

droplets usually fall to the ground or on to surfaces rather than travelling through air over long distance. Less commonly, people may become infected by touching a contaminated surface and then touching their face. It is most contagious during the first three days after onset of symptoms, although spread is possible before symptoms appears and from people who do not show symptoms called asymptomatic also as scientific literatures advocate in different web pages of google search.

RESULTS AND DISCUSSION

COVID-19 is an infectious disease caused by severe acute respiratory syndrome, which was first identified in December 2019 in Wuhan, China and has since spread globally, resulting in an ongoing pandemic. As on 21 May 2020, more than 101639 lakh cases have been reported in India, resulting in more than 3163 deaths. More than 42298 peoples have recovered. COVID-19 cases have been reported across 187 countries and territories. Common symptoms of COVID-19 include fever, cough, fatigue, shortness of breath and loss of taste and smell. While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome, multi-organ failure and septic shock. The time from exposure to onset of symptoms is typically around five days but may range from two to fourteen days. Recommended measures to prevent infection include frequent hand washing, maintaining physical distance from others, quarantine (for those with symptoms), covering coughs and keeping unwashed hands away from face. The use of face covering is recommended for those who suspect they have the virus and caregivers. Recommendation for face covering use by the general public vary with some authorities recommending for them. Some recommending against them and other requiring their use. There is limited evidence for or against the use of masks in healthy individuals in the wider community. The center for disease control and prevention (CDC) of the USA recommended covering the mouth and nose with a tissue when coughing or sneezing and recommends using the inside of elbow if no tissue is available. Proper hand hygiene after any cough or sneeze is encouraged. The CDC has recommended the use of cloth face coverings in public settings where other social distancing measures are difficult to maintain, in part to limit transmission by asymptomatic individuals. Although no vaccine has completed clinical trials, there are multiple attempts in progress to develop a vaccine against COVID-19. On the contrary patients number and death rate are on the record (Table 1).

Table 1.
COVID-19 Patients number and death rate in top states of India
(Reports as updated on 18.05.2020)

State	Patients	Death	Average growth	Double rate
Maharastra	35058	1249	6.5	10.5
Gujarat	11745	694	5.5	12.9
Tamil Nadu	11760	81	9.1	8.1
Delhi	10554	116	5.8	12.3
Rajasthan	5507	138	4	17.4
Madhya Pradesh	5236	252	3.4	22.8
Uttar Pradesh	4605	118	3.7	19.9
India	101639	3163	6	12

Fever is the most common symptom, although some older people and those with other health problems experience fever later in the disease. Other common symptoms include

cough, loss of appetite, fatigue, shortness of breath, sputum production, and muscle and joint pains. Symptoms such as nausea, vomiting and diarrhea have been observed in various percentages. Less common symptoms include sneezing, runny nose or sore throat. Some cases in China initially presented with only chest tightness and palpitations. A decrease sense of smell or disturbances in taste may occur. Loss of smell was a presenting symptom in 30% of confirmed cases in South Korea. The disease is spread during close contact, often by small droplets produced during coughing, sneezing or talking. During close contact (1 to 2 meter), people catch the disease after breathing in contaminated droplets that were exhaled by infected people. Contaminated droplets also cause infection when they settle in the noses or mouths of people in close proximity. However the droplets are relatively heavy, usually fall to the ground or surfaces and do not travel far through the air (Bhatia,2020; Blendon *et al.*, 2008; Saikia *et al.*, 2020 and Chan *et al.*, 2012).

People are most infectious when they show symptoms (even mild or non-specific symptoms), but may be infectious for up to two days before symptoms appear (pre-symptomatic transmission). They remain infectious an estimated 7 to 12 days in moderate cases and an average of two weeks in severe cases. Some people have recovered with showing symptoms and may still be able to spread COVID-19, although uncertainties remain. Studies report that during infection by endocytosis in enter in cytoplasm and loose its genomic elements which multiply and after 5 days by exocytosis these genomic elements come outside and infect to other persons. The further study reported that viral load was highest at symptoms onset, and so may have peaked before symptoms developed. According to the World Health Organization, there are no available vaccines or specific antiviral treatments for COVID-19 (WHO, 2020). On the 1st may 2020, the United States gave emergency use authorization to antiviral remdesivir for people hospitalized with serve COVID-19 (<http://theprints.in/health/indians>). Management involved in the treatment of symptoms, supportive care, isolation and experimental measures. When the contaminated droplets fall to floors or surfaces they can, through less commonly, remain infectious if people touch contaminated surfaces and their eyes, nose or mouth with unwashed hands. On surfaces the amount of active virus decreases over time until it can no longer cause infection and surfaces are not thought to be the main way that the virus spreads. It is unknown that what amount of virus on surfaces is required to cause infection via this method, but it can be detected for up-to 4 hours on copper, up-to one day on cardboard and up-to 3 days on plastic and stainless steel. Surfaces are easily decontaminated with household disinfectants which kills the virus outside the human body or on the hands (Huang *et al.*, 2020 and Emmie *et al.*, 2016 Disinfectants or bleach are not a treatment for COVID-19 and cause health problems when not use properly, such as when used inside human body. Preventive measures to reduce the chances of infection include staying at home, avoiding crowded places, keep distance of two yards from others, washing hands with soap and water for at least 20 seconds, practicing good respiratory hygiene and avoiding touching the eyes, nose or mouth with unwashed hands. In India up-to 21 May 2020, different data show that Uttar Pradesh Government doing better efforts than other top states of India.

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