

Novel Coronavirus: A Global Catastrophe and Boutade

Rajput Mansi¹, Sharma Rajesh²

^{1,2}School of Medical and Allied Sciences, K.R. Mangalam University, Sohna Road Gurugram, Haryana, India-122103

Abstract: Corona viruses are the pathogens found in animal and humans. They are RNA viruses with enveloped positive sense, which are attributed by the club-like spikes projecting from their surface having an exceptionally large RNA genome and a distinctive replication strategy. Many features like biology, pathogenesis and disease of the virus that is exhibited so tremendously in the world wide SARS epidemic are being recognizable and amicable to the core of researchers and analyst who have worked with this captivating and enthralling class of virus. The understanding of the revampment of the virus to new environment, trans species infection and exposure of new disease have been made easy by the evolution in biology of corona viruses. In Wuhan, a city in the Hubei province of China, agglomeration of pneumonia cases were reported and novel corona virus was recognized for the effectuation, at the end of 2019. The virus proliferated briskly, resulting in an epidemic throughout the China as well as in other countries. WHO assigned the disease COVID-19, in February 2020, which means coronavirus disease. And the virus causing COVID-19 is ordained as ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 (SARS-COV-2). The disease escalated from China to 26 other countries, as of Feb 18 2020. Replication of phylogenetic material takes place on zoonotic origin that is why person-to-person transmission is responsible for alacritous spread of this virus. Various studies offer ancillary enlightenment into person-to-person transmission. Although the primary gap due to the lack of fundamental data concerning the transmissibility between humans plus the level of exposure to a confirmed case at which dissemination is more likely to occur and the transmissibility between humans remains. In India the beginning of the coronavirus pandemic started as on 30 January 2020 in a student who had returned from Wuhan university to Kerala. This was the first case in India for 2019-2020. The ministry of health and family welfare has established a whole of 428 cases and 9 deaths in the country as of 23rd March 2020.

Keywords: SARS, COVID-19, PHYLOGENIC, ZOONOTIC ORIGIN

1. Introduction

The 2019-20 COVID-19 pandemic is still evolving caused by SARS-COV-2. The outbreak was recognized by WHO on 23rd March 2020, which was started in Wuhan, Hubei, China. 266,070 cases of the disease have been in 160 countries and territories which triggered more than 11,184 deaths and around 1,02,000 recoveries by 23rd March. China, Europe, Iran, South Korea, and the United States are the countries affected by the outbreak. In India the beginning of the coronavirus pandemic started as on 30 January 2020 in a student who had returned from Wuhan university to Kerala. This was the first case in India for 2019-2020. The ministry of health and family welfare has established a whole of 428 cases and 9 deaths in the country as of 23rd March 2020.

2. History

- One more coronavirus emerged in 2012 which was responsible for causing MERS (middle east respiratory syndrome) in human, which was competent to cause severe acute respiratory illness. Saudi Arabia reported the first case and the countries like France, Germany, Jordan, Qatar, Tunisia, The United Arab Emirates, and the United Kingdom were also poncey by it. All asserted cases were rooted to the middle east. Almost one-third of the confirmed cases resulted in death. Bats are considered to be the origin of Novel MERS coronavirus and it is believed that the virus infected other animals before being radiated to humans. Identification of camel was done as the only possible reservoir for MERS virus.
- SARS-COV-2 coronavirus seemingly close to SARS coronavirus emerged in Wuhan, China in late 2019 causing illness named as COVID-19 and was characterized

primarily by fever and respiratory symptoms. Virus was similarly pandemic. It is being carried by the tourists from the regions of China being affected to different parts of United States and Europe by early 2020. Henceforth WHO promulgated the outbreak a 'pandemic'.

3. Life Cycle

The group 2 murine model coronavirus and mouse hepatitis virus are the finest model studied for coronavirus and most of the knowledge is determined by studying its lifecycle in animals and in culture using the virus. Here, Centre of attention will be MHV juxta positioning SARS-COV and other coronaviruses.

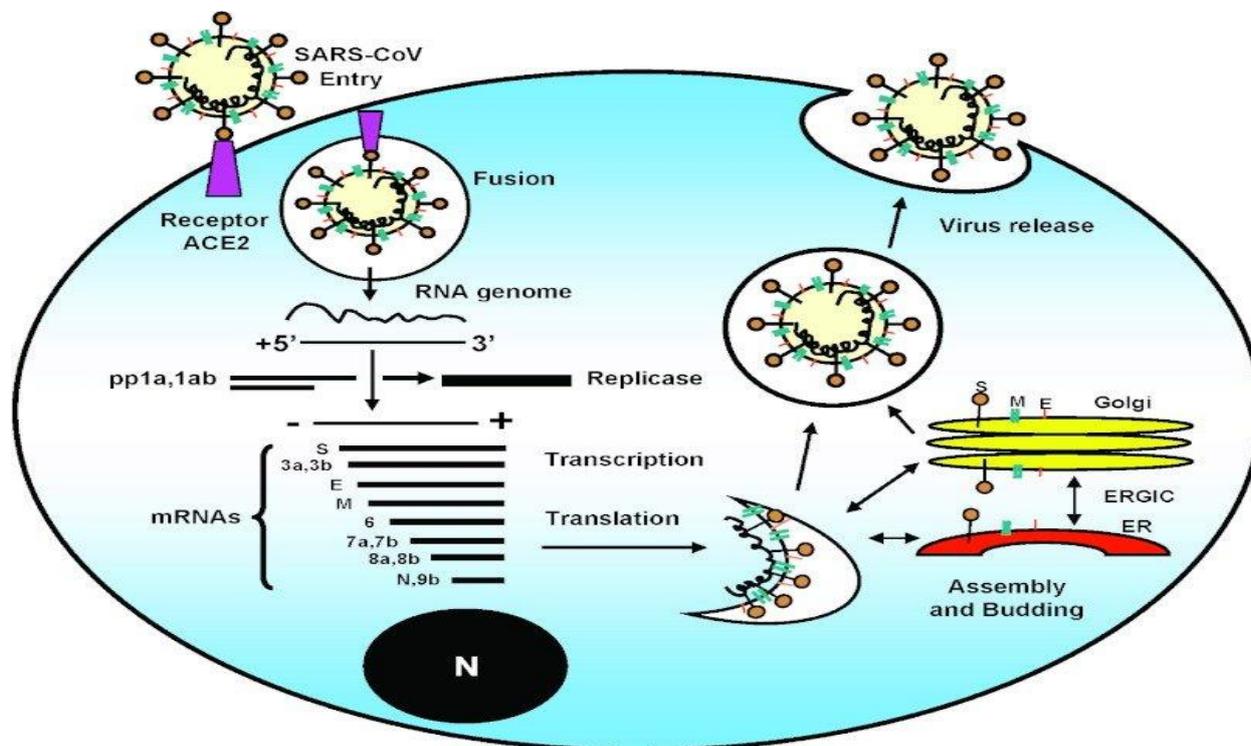
Host proteins and coronavirus life cycle

The virus enters the host cell by attaching to its receptors present on the surface of host cell body. Uncoating of the rib-nucleocapsid is followed by entry which in turn expose the positive-sense genomic RNA and the host ribosomes carry out translation yielding the viral replication complex. The host proteins such as hnRNPA1 succor in the genome replication and viral transcription and the viral replication complex continues to grow. This process yields a set of positive sub-genomic mRNAs along with the full-length virus genome. After translation the sub-genomic sized mRNAs are converted to viral structural (S, E, M, N) and accessory proteins with the help of host ribosomes. The positive sense genomic RNA is packed into a rib-nucleocapsid by the N protein and β -actin helps in congregating into the virus particles. This step is then followed by the maturation as they pass through the Golgi apparatus. The virus leaves the host cell by exocytosis after utilizing its cell machinery for replication.

Volume 9 Issue 3, March 2020

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY



Diagnosis techniques for Covid-19

The laboratories techniques confirmed by WHO for the diagnosis of coronavirus are: -

- 1) **Nucleic acid amplification tests (NAAT) for COVID-19 virus:** Detection of unique sequences of virus RNA is done by NAAT such as real time reverse transcription polymerase chain reaction (Rt-PCR) and confirmation of nucleic acid sequence is done when necessary for routine confirmation. N, E, S AND RdRP viral genes are aimed at so far.
- 2) **Serology tests:** The people who have been wide open to the virus can easily be detected using this test (antibodies to SARS-CoV). During infection these bodies are produced as the body's immune response to the attack of the viruses, bacteria and other microbes during infection. The person once infected will develop these antibodies against that virus and hence the patient may have encountered the virus previously.
- 3) **Viral sequencing:** Furthermore, to the confirmation of the presence of the virus, the percentage from regular sequencing of specimens from clinical cases is useful in monitoring viral genome mutations, these mutations can have a counter effect on the performance, including diagnostic tests. The deposition of genetic sequence is available, including GISAID, protecting the rights of submitting party.
- 4) **Viral culture:** This method does not fall under routine diagnostic procedure.

Transmission of coronavirus respiratory disease

Coronavirus can be primarily transmitted in humans by respiratory droplets produced during sneezing and coughing or coming in contact with them. Coronavirus spike protein interacts with the complement host cell receptor and it is responsible for determining the tissue tropes, infectivity and species range of the virus. For example: -ACE2 (angiotensin converting enzyme 2) receptor attaches to the spike of SARS coronavirus and infect human.

Symptoms of SARS-COVID2019

The symptoms which appear after 2-14 days of exposure are: -

- Fever
- Cough
- Shortness and breath
- Joint pain
- Renal failure
- Running nose
- Sore throat
- Can lead to pneumonia
- Dyspnoea
- headache

These symptoms appear from mild to severe illness and death for confirmed coronavirus disease 2019 (COVID-19) cases.

4. Prevention

- 1) Warm water and soap should be used to wash hands very often.
- 2) Hand sanitizer should be used having isopropyl alcohol.
- 3) Use of face mask is recommended during travelling, working and talking.
- 4) Public gatherings and overcrowded places like hospitals, schools, colleges, gym and clubs should be ignored.
- 5) Avoid touching your face.
- 6) Avoid travelling if you feel sick.
- 7) Maintain a distance of at least 3 feet from anyone who sneeze or coughs.
- 8) Always cover your mouth while sneezing or coughing. Immediately throw away the used tissues.
- 9) Clean using disinfectant on frequently used items like phones, computers, utensils etc.

Treatment of SARS COVID-19

- At present, cure for coronavirus is unknown treatment of coronavirus are based on “supportive care” according to (CDC) i.e.; the care given during influenza (seasonal flu) and other respiratory diseases. The treatment primarily works on the symptoms like fever, cough and shortness of breath. In primary cases, rest and fever inducing medications such as acetaminophen (Tylenol) is provided for comfort.
- Antifungal drugs like oseltamivir or Tamiflu are sometimes used by doctors for treating COVID-19 patients, which have helped in suppressing the virus’ reproduction in some cases. Michigan tech virologist “Ebenezer tumhan” that Tamiflu targeted an enzyme on the influenza virus not on coronavirus. Antiviral drug remdesivir is in under trial in the university of Nebraska medical centre by the national institutes of health, announced by the agency in Feb 25.the drug used to treat Ebola and HIV are also being researched and tested in China.
- Hilary martson, a medical officer and policy advisor at the national institute of allergy and infectious disease (NSAID) said here is no vaccination for treating coronavirus so far, at Harvard T.H. Chan school of public health on march2 2020. Volunteers are being recruited by the doctors of Seattle for clinical trials of vaccine made for COVID-19, being developed by the biotechnology company of Moderna Therapeutics. On the other hand, the biomedical ethicists are solicitous that the major step in vaccine development was skipped. To hasten the vaccine development, the analyst and researchers didn’t revealed that it triggers an immune response in animals, and this is a major step usually required before human testing.
- The researchers started enlisting people for the clinical trial on the same day they did the begin testing on lab mice reported by the Stat News .The vaccine triggered a immune response on the mice similar to the response observed in coronavirus MERS-CoV.(The immune system is already primed by the vaccines to identify the virus like SARS-CoV-2 as an foe and an attack is put up against it.)
- The drug from the same class of antiviral named “favipiravir” proved worthy in treating many cases in china.
- No antibiotic is capable of treating or preventing coronavirus.

- [6] <https://www.pharmaceutical-technology.com/features/coronavirus-outbreak-responding-china-wuhan/>
- [7] https://journals.lww.com/pidj/Fulltext/2005/11001/History_and_Recent_Advances_in_Coronavirus.12.aspx
- [8] <https://www.medicaldevice-network.com/news/fda-coronavirus-test/>
- [9] <https://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117>
- [10] https://en.wikipedia.org/wiki/2019%E2%80%932020_coronavirus_pandemic
- [11] <https://www.livescience.com/can-coronavirus-be-cured.html>
- [12] https://www.researchgate.net/figure/Host-proteins-and-the-coronavirus-life-cycle-Virus-particle-attaches-onto-the-host-cell_fig3_229428038

References

- [1] <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>
- [2] <https://www.ncbi.nlm.nih.gov/pubmed/16378050>
- [3] <https://www.healthline.com/health/coronavirus-covid-19>
- [4] <https://edition.cnn.com/2020/03/14/health/coronavirus-asymptomatic-spread/index.html>
- [5] <https://www.britannica.com/science/coronavirus-virus-group>