A REVIEW ON CORONA VIRUS(COVID-19)

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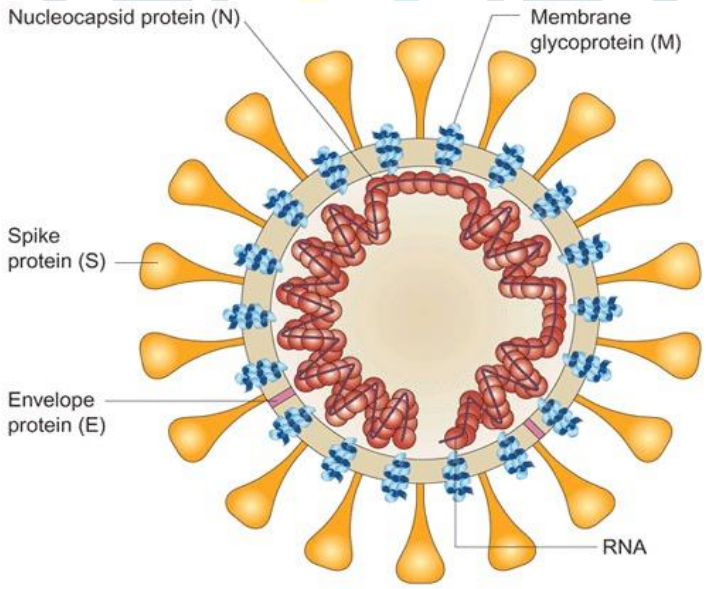
Abstract: Corona viruses causes common cold and infections caused by corona viruses are generally, self – resolving. The name 'corona virus' is derived from the Latin corona, meaning crown or halo, and refers to the characteristics appearance of virions under electron microscopy (E.M.) with a fringe of large, bulbous surface projections creating an image reminiscent of royal crown or of the solar corona. Coronaviruses are a group of enveloped viruses with non-segmented, single stranded and RNA genomes. Severe acute respiratory syndrome coronaviruses (SARS-Co V) are zoonotic and Middle East respiratory syndrome coronavirus (MERS-Co V). The virus embedded envelope protein and replication of the RNA genome proceeds through the generation of nested set of viral mRNA molecules. Replication of HCoV is regulated by a diversity of host factors and induces drastic alteration in cellular structure and physiology. It is predicted that proteins 3b and 6 were highly divergent from those proteins in all known SARS Co V. Coronavirus entry is mediated by the viral spike (S) glycoprotein.

I. INTRODUCTION

A novel coronavirus, designated as 2019-nCoV, emerged in Wuhan, China, at the end of 2019. As of January 24, 2020, at least 830 cases had been diagnosed in nine countries: China, Thailand, Japan, South Korea, Singapore, Vietnam, Taiwan, Nepal, and the United States. Twenty-six fatalities occurred, mainly in patients who had serious underlying illness. Although many details of the emergence of this virus — such as its origin and its ability to spread among humans — remain unknown, an increasing number of cases appear to have resulted from human-to-human transmission. Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome. Viruses need to overcome the cell membrane barrier. Enveloped viruses achieve this by membrane fusion, a process mediated by specialized viral fusion proteins. Upon receptor binding at the cell membrane, the fusion proteins undergoes dramatic conformational transition.



Spike Protein(S) :- Binding of host cell receptor to facilitate entry of host cell.
Membrane Protein (M) :- Organiser of CoV assembly
Envelope Protein (E) :- Interacts to form viral envelope
RNA :- Bound to RNA genome to make up nucleocapsid.

Replication of Coronavirus begins with entry to the cell which takes place in the cytoplasm in a membrane-protected microenvironment. Upon entry to the cell the virus particle is uncoated and the RNA genome is deposited into the cytoplasm. Coronaviruses also have a protein known as a replicase encoded in its genome which allows the RNA viral genome to be transcribed into new RNA copies using the host cell's machinery. The replicase is the first protein to be made; once the gene encoding the replicase is translated, the translation is stopped by a stop codon. This is known as a nested transcript. When the mRNA transcript only encodes one gene, it is *monocistronic*. A coronavirus non-structural protein provides extra fidelity to replication because it confers a proofreading function, which is lacking in RNA dependent RNA polymerase enzymes alone.

Transmission

Limited research is available on how coronavirus spread from one person to the next. However, researchers believe that the viruses transmit via fluids in the respiratory system such as mucus. Droplets transmission was reported to occur when respiratory droplets when infected person coughs or sneezes are ingested or inhaled by individuals nearby in close proximity. Contact transmission may occur when a subject touches a surface or object contaminated with the virus and subsequently touch their mouth, nose or eyes and aerosol transmission may occur when respiratory droplets mix into the air , forming aerosols and may cause infection when inhaled high dose of aerosols into the lungs.

Diagnosis and treatment

It must be appreciated that no matter how accurate and fast laboratory testing methods are, the diagnosis of viral pneumonias such as caused by SARS-CoV2 involves collecting the correct specimen from the patient at the right time. The endemic HCoVs have been detected from a variety of upper and lower respiratory sources including throat, nasal, sputum and bronchial fluid. RT-PCR has become the method of choice for diagnosis of human CoV, as multiplex real-time RT-PCR assays have been developed, are able to detect all four respiratory HCoVs and could be futher adapted to novel CoVs.

If symptoms are more severe, supportive treatments may be given by doctors such as:-

Fluids to reduce the risk of dehydration
Medication to reduce a fever
Supplemental oxygen in more severe cases

Vaccines and treatments option for COVID-19 are currently being investigated around the world. There's some evidence that certain medications may have the potential to be effective with regards to preventing illness or treating the symptoms of COVID-19.

Here's some treatment that are currently being investigated for protection against COVID-19 symptoms:

Remdesivir
Chloroquine
Lopinavir and ritonavir
Favilavir

Symptoms

Symptoms vary from person to person and some forms of the virus can be fatal.

Symptoms include:

Sneezing
Runny nose
Cough
Watery diarrhea
Fever in rare cases
Sore Throat
Exacerbated asthma

There is no cure of coronavirus so, treatment include self-cure. People can take several steps, including:

1. Drinking enough water.
2. Using a clean humidifier or cool mist vaporiser.
3. Standard recommendation to prevent infection spread.

III. CONCLUSION

It is likely that these viruses will continue to emerge and to evolve and cause both human and veterinary outbreaks owning to their ability to recombine, mutate and infect multiple species and cell types. Future research on coronavirus will continue to investigate many aspects of viral replication and pathogenesis. As bat seem to be a significant reservoir for these viruses. It will be interesting to determine how they seem to avoid clinically evident disease and become persistently infected. Many of the non-structural and accessory proteins encoded by these viruses remain uncharacterised with no known function, and it will be important to identify mechanisms of action for these proteins as well as defining their role in viral replication and pathogenesis. These studies should lead to a large increase in the number of suitable therapeutic targets to combat infection. Defining the mechanism of how coronaviruses cause disease and understanding the host immunopathological response will significantly improve our ability to design vaccine and reduce disease burden.

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