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Open test question

Discuss the etiology,origin,structure and,pathophysiologyof COVID-19

**Etiology**

Corona viruses are zoonotic(bat as the resovior ,pangolin as the intermediate host and then human as its host) It's unclear exactly how contagious the coronavirus is. It appears to spread through human to human transmission among those in close contact. It may be spread by respiratory droplets released when someone with the virus coughs or sneezes.

It may also be spread if a person touches a surface with the virus on it and then touches his or her mouth, nose or eyes. It can also be spread through fecal-oral route

**Origin**

The SARS-CoV-2 is a β-coronavirus, which is enveloped non-segmented positive-sense RNA virus (subgenus sarbecovirus, Orthocoronavirinae subfamily) Coronaviruses (CoV) are divided into four genera, including α−/ β−/γ−/δ-CoV. α- and β-CoV are able to infect mammals, while γ- and δ-CoV tend to infect birds. Previously, six CoVs have been identified as human-susceptible virus, among which α-CoVs HCoV-229E and HCoV-NL63, and β-CoVs HCoV-HKU1 and HCoV-OC43 with low pathogenicity, cause mild respiratory symptoms similar to a common cold, respectively. The other two known β-CoVs, SARS-CoV and MERS-CoV lead to severe and potentially fatal respiratory tract infections. It was found that the genome sequence of SARS-CoV-2 is 96.2% identical to a bat CoV RaTG13, whereas it shares 79.5% identity to SARS-CoV. Based on virus genome sequencing results and evolutionary analysis, bat has been suspected as natural host of virus origin, and SARSCoV-2 might be transmitted from bats via unknown intermediate hosts to infect humans. It is clear now that SARS-CoV-2 could use angiotensin-converting enzyme 2 (ACE2), the same receptor as SARS-CoV , to infect humans.

**Structure**

Spherical or pleomorphic enveloped particles containing single-stranded (positive-sense) RNA associated with a nucleoprotein within a capsid comprised of matrix protein. The envelope bears club-shaped glycoprotein projections. one strain of SARSCoV-2, is 29.9 kb

Some part of virus genome encodes four essential structural proteins, including spike(S) glycoprotein, small envelope (E) protein, matrix (M) protein, and nucleocapsid (N) protein and also several accessory proteins, that interfere with the host innate immune response.

**Patho-Physiology**

Presence of lymphopenia (with increased neutrophils) and cytokine storm. An increase also in proinflammatory cytokines such as IL-2, IL-6, IL-7, IL-10, G-CSF, CRP, IP-10, MCP-1, MIP-1A, and TNFα, A delayed Type 1 interferon response is observed during acute but, chronic infection causes an increase in Type 1 Interferon. which can trigger the lung dysfunction).

**References**

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