A comprehensive review of the aetiology of Covid-19, pathogenesis, histopathological features, potential treatment therapies and its future in public health.

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Aetiology of Covid-19

Although the major cause of the Corona Virus Disease (Covid-19) is actually not known a lot of cases having been linked to seafood species in the province of Wuhan china. Other cases too have been linked to the consumption of bats and other rodents such as rats as the cause of the disease.

Pandemic curves have shown that this pandemic may be a mixed outbreak pattern suggesting early cases of the disease come potentially from the Wuhan seafood market. CoVs are positive stranded viruses with a crown like appearance under the microscope, due to the presence of spiky glycoproteins on the envelope. The subfamily orthocoronavirinae of the coronaviridae family (order Nidovirales) classifies into four genera of CoVs: Alphacoronavirus, Beta coronavirus, Delta coronavirus and Gamma coronavirus.

Pathogenesis of Covid-19

Patients with Covid-19 show clinical manifestations including fever, non-productive cough, dyspnea, myalgia, fatigue, higher leukocyte numbers, abnormal respiratory findings and increased levels of plasma pro-inflammatory cytokines. A particular report showed a patient at 5 days of fever presented with a cough, coarse breathing sounds of both lungs, and a body temperature of 39.0°C. The patient’s sputum showed real-time polymerase chain reaction results that confirmed the infection.

The lab studies showed leucopenia with leukocytes counts of 2.91 ×10ˆ9 cells/L of which 70.0% were neutrophils. Additionally, a value of 16.16mg/L of blood C-reactive protein was noted which is above the normal range. High erythrocyte sedimentation rate and D-dimer were also observed. The main pathogenesis of COVID-19 infection as a respiratory system targeting virus was severe pneumonia, RNAaemia, combined with the incidence of ground-glass opacities, and acute cardiac injury. Significantly high blood levels of cytokines and chemokines were noted in patients with COVID-19 infection that included IL1-B, IL1RA, IL7, IL8, IL9, IL10, basic FGF2, GCSF, GMCSF,

Histopathology of Covid-19

A dissection was carried out on the lung of a patient who had covid-19 to describe the pathological changes by HE staining, immunohistochemistry and special staining. The changes in the lung showed bronchiolitis and alveolitis with proliferation, atrophy, desquamation and squamous metaplasia of epithelial cells. Massive pulmonary interstitial fibrosis and partly hyaline degeneration, variable degrees of hemorrhagic pulmonary infarction. Small vessels hyperplasia, vessel wall thickening, lumen stenosis and occlusion. Focal monocytes, lymphocytes and plasma cells infiltrating into pulmonary interstitium. Alveolar congestion was prominent and contained edema fluid, desquamated epithelial cells, and inflammatory cells.

Atrophy, vacuolar degeneration, proliferation, desquamation and squamous metaplasia in alveolar epithelial cells. We also found several multinucleate giant cells and intracytoplasmic viral inclusion bodies. Immunohistochemistry results showed positive for immunity cells including CD3, CD20, CD79a, CD4, CD8, CD5, CD68 and CD38

Treatment

At present no effective antiviral treatment or vaccine has been made available, however a randomized multicentre clinical trail is currently underway to assess the efficacy of abidole in patients with COVID-19. First line treatment for fevers should include paracetamol while expectorants should be used for non-productive cough.

Patients with severe acute respiratory infection, respiratory distress, hypoxemia or shock require the administration of immediate oxygen therapy. In absence of shock intravenous fluid should be used. Renal replacement therapy (RRT) should be initiated for patients with AKI.

Comments

Covid-19 has drastically affected the lives of a lot of people mostly those in the medical field due to the immergence of the virus many new treatment therapies and drugs are been worked one, which eventually could lead to the discovery of an efficient treatment for the disease. It may not have been the most disastrous disease but it has ignited a change in live still habits of both those who have contacted and those who haven’t. In the future covid-19 might not been as dangerous as what it is now but it surely would still be revered as the disease that changed the medical system.

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