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ASSIGNMENT TITLE; GROSS ANATOMY OF THE THORAX AND ABDOMEN

ASSIGNMENT QUESTION: COVID-19 IS THE ONGOING VIRAL PANDEMIC IN THE WORLD AND THE REASON YOU AT HOME. DISCUSS THE ANATOMICAL IMPLICATION OF THE VIRUS ON THE RESPIRATORY SYSTEM OF HUMAN.

COVID-19 the coronavirus disease caused by SARS-COV-2 belong to the coronaviridae family in the Nidovirales order. Corona represents crown-like spikes on the outer surface of the virus; thus, it was named as a coronavirus. Coronavirus are minute in size (65-125nm in diameter) and contain a single-stranded RNA as a nucleic material, size ranging from 26 to 32kbs in length. The subgroups of coronaviruses family are alpha, beta, gamma, and delta coronavirus.

The sever acute respiratory syndrome coronavirus (SARS-COV), H5N1 influenza A, H1N1 2009 and middle east respiratory syndrome coronavirus (MERS-COV) cause acute lung injury ALI and acute respiratory distress syndrome ARDS which leads to pulmonary failure and result in fatality. These viruses were thought to infect only animals until the world witnessed a severe acute respiratory syndrome SARS outbreak caused by SARS-COV IN 2002, Guangdong, China And a decade later in China. This virus was reported to be a member of the beta group. The infected patients were reported to have exhibited pneumonia symptoms with a diffused alveolar injury which lead to acute respiratory distress syndrome ARDS.

All coronaviruses contain specific genes in ORF1 downstream regions that encode proteins for viral replication, nucleocapsid and spikes formation. The glycoprotein spikes on the outer surface of coronaviruses are responsible for the attachment and entry of the virus to host cells. The receptor-binding domain RBD is loosely attached among virus, therefore, the virus may infect multiple host. Other coronaviruses mostly recognize aminopeptidases or carbohydrates as a key receptor for entry to human cells while SARS-COV and MERS-COV recognize exopeptidases.

The entry mechanism of a coronavirus depends upon cellular proteases which include, human airway trypsin-like proteases serine2 TMPRSS2 that split the spike protein and establish further penetration changes MERS- coronavirus employs dipeptidyl peptidase4 DPP4 while HCoV-NL63 and SARS- coronavirus require angiotensin-coverting enzyme 2 ACE2 as a key receptor SARS-COV2 possesses the typical coronavirus structure with spike protein and also expressed other polyproteins, nucleoproteins and membrane proteins such as RNA polymerase, 3-chymotrypsin-like protease, papain-like protease, helicase, glycoprotein, and accessory proteins. The spike protein of SARS-COV-2 contains a 3D structure in the RBD region to maintain the Van der waals forces. The 394 glutamine residue in the RBD region of SARS-COV2 is recognised by the critical lysine 31 residue on the human ACE2 receptor.

When people with covid 19 develop a cough, sore throat and fever its said to be the result of the infection reaching the respiratory tree- the air passages that conduct air between the lungs and the outside. The lining of the respiratory tree becomes injured, causing inflammation. This in turn irritates the nerves in the lining of the airway. Just a speck of dust can stimulate a cough. But if it gets worse, it goes past just the lining of the airway and goes to the gas exchanges units, which are at the end of the air passages. If they become infected they respond by pouring out inflammatory material into the air sacs that are at the bottom of our lungs. If the sacs then become inflamed it causes an outpouring of inflammatory material both fluid and inflammatory cells into the lungs and we end up with pneumonia. Lungs that becomes filled with inflammatory material are unable to get enough oxygen to the bloodstream, reducing the body’s ability to take on oxygen and get rid of carbondioxide. The covid 19 affects all part of the lungs making them appear whiteand opaque on chest x-rays called bilateral lung opacities on chest imaging. The thicker the wall of the alveolus gets the harder it is to transfer oxygen and the more the person feel short of breath and the more and more you start moving towards severe illness and possibly death.

OTHER ORGANS THE COVID 19 AFFECTS

The nose and mouth- the taste and smell becomes lost in individuals having tested positive to the covid 19.

The eyes- about 1%to 3% of people with the coronavirus have pinkeye.

SSSStomach and intestines- the virus can cause a loss of appetite, nausea, diarrhea, and indigestion, you may have these symptoms before fever or any respiratory problems.

Liver- early studies have found that in severe cases, covid 19 might lead to liver problems or damage.