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OVERVIEW ON COVID-19 (Coronavirus Disease)

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ABSTRACT

Nowadays, the whole World is under threat of Coronavirus disease (COVID-19). the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus originated in bats and was transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019. The disease is transmitted by inhalation or contact with infected droplets and the incubation period ranges from 2 to 14 d. The symptoms are usually fever, cough, sore throat, breathlessness, fatigue, malaise, among others. The disease is mild in most people; in some (usually the elderly and those with comorbidities), it may progress to pneumonia, acute respiratory distress syndrome (ARDS) and multi organ dysfunction. The ongoing COVID-19 pandemic has resulted in many fatalities and forced scientific communities to foster their Research and Development (R&D) activities. As a result, there is an enormous growth of scholarly literature on the subject.

Keyword: - COVID-19, SARS-CoV-2, WHO COVID-19 database

1. INTRODUCTION

In recent years, several new diseases came in different geographical areas, including Ebola virus, Zika virus, Nipah virus and coronaviruses (CoVs). But recently there was a new type of viral infection which emerged in Wuhan city of China, which was first detected in December 2019 and causes the highly infectious disease referred to as COVID-19. Many of the initial cases had a common exposure to the Huanan wholesale seafood market that also traded live animals. The surveillance system (put into place after the SARS outbreak) was activated and respiratory samples of patients were sent to reference labs for etiologic investigations. On December 31st 2019, China notified the outbreak to the World Health Organization and on 1st January the Huanan sea food market was closed. On 7th January, the virus was identified as a coronavirus that had >95% homology with the bat coronavirus and > 70% similarity with the SARSCoV [1]. COVID-19 has spread worldwide to become a global pandemic affecting more than 25 million people as of August 2020 and caused the death of more than 800,000 people worldwide [2].

COVID-19 is like Severe acute respiratory syndrome coronavirus (SARS-CoV) Virus in its pathogenicity and epidemiology. On 30th January 2020, World Health Organization (WHO) officially declared that the COVID -

19 epidemic as a public health emergency of international concern. Several research works were carried out in which it was identified that SARS-CoV-2 belongs to 3-coronavirus with highly identical genome to bat coronavirus, pointing to bat as the natural host as shown in figure 1. The novel coronavirus uses the same receptor, as that of SARS-CoV and it spreads through the respiratory tract. Increasingly evidence showed Human-Human transmission along with many cases across the globe. The incubation period ranges from 2 to 14 days. The clinical symptoms of COVID-19 patients include fever, cold, fatigue, loss of smell or taste, rash on skin or gastrointestinal infection symptoms.

2. Data and Material

The incidence of SARS-CoV-2 infection is seen most often inadult male patients with the median age of the patients wasbetween 34 and 59 years. SARS-CoV-2 is also morelikely to infect people with chronic comorbidities such as cardio-vascular and cerebrovascular diseases and diabetes [3]. The highestproportion of severe cases occurs in adults ≥60 years of age, andin those with certain underlying conditions, such as cardiovascularand cerebrovascular diseases and diabetes. Severe mani-festations maybe also associated with coinfections of bacteria andfungi [4]. Fewer COVID-19 cases have been reported in children lessthan 15 years [5,6]. Figure 2 shows the Potential Transmission routes for SARCoV-2. Coronaviruses are positive-sense RNA viruses which have an extensive and promiscuous range of natural hosts and which can affect the multiple systems. Coronaviruses can even cause diseases in humans that may extend from the common cold to more severe respiratory diseases like SARS and MERS. The recently emerging SARS-CoV-2 has caused havoc in China and caused a pandemic situation in the worldwide population, leading to disease outbreaks that have not been controlled to date, although there are extensive efforts which are being put in place to counter this virus [7] figure 3.

This virus has been proposed the name severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV), which determined the virus belongs to the Severe acute respiratory syndrome-related coronavirus category and found this virus is related to SARS-CoVs. SARS-CoV-2 is a member of the order Nidovirales, family Coronaviridae, subfamily Orthocoronavirinae, which is subdivided into four genera viz. Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus. The genera Alphacoronavirus and Betacoronavirus originate from bats, while Gammacoronavirus and Deltacoronavirus have evolved from bird and swine gene pools [8]. The structure Structure of SARS-CoV-2 is shown on figure 4..

To date, it has been found that all ages are susceptible to COVID-19 infection. The world map of COVID-19 mediated infections and deaths showed that no country, race, ethnicity, or religion is spared from this virus. The possible transmission route of this coronavirus is person-to-person, which includes the contact transmission by contacting the nasal, oral, and eye mucosal secretions of the infected patient, as well as the direct transmission by droplet inhalation when the patient coughs or sneezes. Although there are no known ophthalmological symptoms, eye exposure may provide a productive way for the virus to enter the body[9].

After 4 months of struggle that lasted from December 2019 to March 2020, the COVID-19 situation seemed to be under control in China. The wet animal markets have reopened, and people have started buying bats, dogs, cats, birds, scorpions, badgers, rabbits, pangolins (scaly anteaters), minks, soup from palm civet, ostriches, hamsters, snapping turtles, ducks, fish, Siamese crocodiles, and other animal meats without any fear of COVID-19. The Chinese government is encouraging people to feel they can return to normal life. However, this could be a risk, as it has been mentioned in advisories that people should avoid contact with live-dead animals as much as possible, as SARS-CoV-2 has shown zoonotic spillover. In addition to that, we cannot rule out the possibility of new mutations in the same virus being closely related to contact with both animals and humans at the market. In January 2020, China imposed a temporary ban on the sale of live-dead animals in wet markets. However, now hundreds of such wet markets have been reopened without optimizing standard food safety and sanitation practices [10,11].

3. CONCLUSION

Several years after the global SARS epidemic, the current SARS-CoV-2/COVID-19 pandemic has served as a reminder of how novel pathogens can rapidly emerge and spread through the human population and eventually cause severe public health crises. Further research should be conducted to establish animal models for SARS-CoV-2 to investigate replication, transmission dynamics, and pathogenesis in humans. This may help develop and evaluate potential therapeutic strategies against zoonotic CoV epidemics. Present trends suggest the occurrence of future outbreaks of CoVs due to changes in the climate, and ecological conditions may be associated with human-animal contact. Live-animal markets, such as the Huanan South China Seafood Market, represent ideal conditions for interspecies contact of wildlife with domestic birds, pigs, and mammals, which substantially increases the probability of interspecies transmission of CoV infections and could result in high risks to humans due to adaptive genetic recombination in these viruses. The COVID-19-associated symptoms are fever, cough, expectoration, headache, and myalgia or fatigue. Individuals with asymptomatic and atypical clinical manifestations were also identified recently, further adding to the complexity of disease transmission dynamics. Atypical clinical manifestations may only express symptoms such as fatigue instead of respiratory signs such as fever, cough, and sputum. In such cases, the clinician must be vigilant for the possible occurrence of asymptomatic and atypical clinical manifestations to avoid the possibility of missed diagnoses.

The present outbreak caused by SARS-CoV-2 was, indeed, expected. Like previous outbreaks, the current pandemic also will be contained shortly. However, the real question is, how are we planning to counter the next zoonotic CoV epidemic that is likely to occur within the next 5 to 10 years or perhaps sooner? Our knowledge of most of the bat CoVs is scarce, as these viruses have not been isolated and studied, and extensive studies on such viruses are typically only conducted when they are associated with specific disease outbreaks. The next step following the control of the COVID-19 outbreak in China should be focused on screening, identification, isolation, and characterization of CoVs present in wildlife species of China, particularly in bats. Both in vitro and in vivo studies (using suitable animal models) should be conducted to evaluate the risk of future epidemics. Presently, licensed antiviral drugs or vaccines against SARS-CoV, MERS-CoV, and SARS-CoV-2 are lacking. However, advances in designing antiviral drugs and vaccines against several other emerging diseases will help develop

suitable therapeutic agents against COVID-19 in a short time. Until then, we must rely exclusively on various control and prevention measures to prevent this new disease from becoming a pandemic.

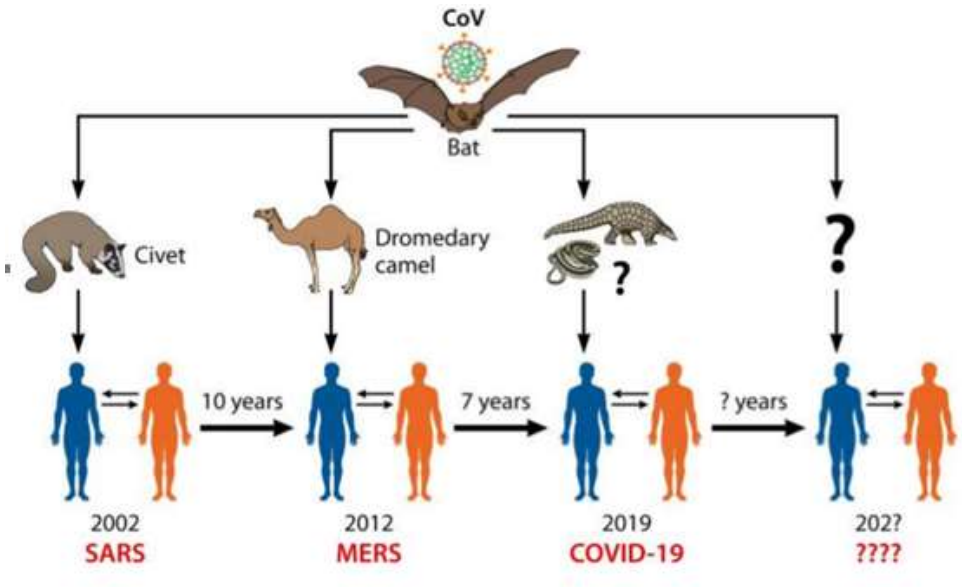

Figure: 1 Shows Bat as Host of SARC-CoV-2

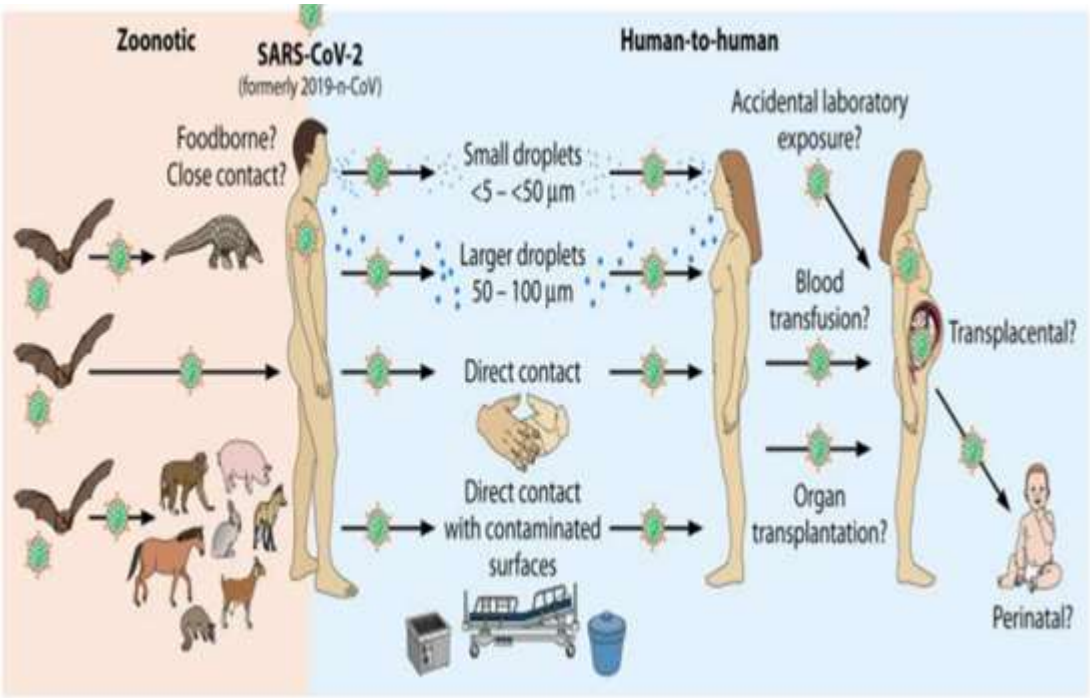

Figure: 2 Potential Transmission routes for SARCoV-2

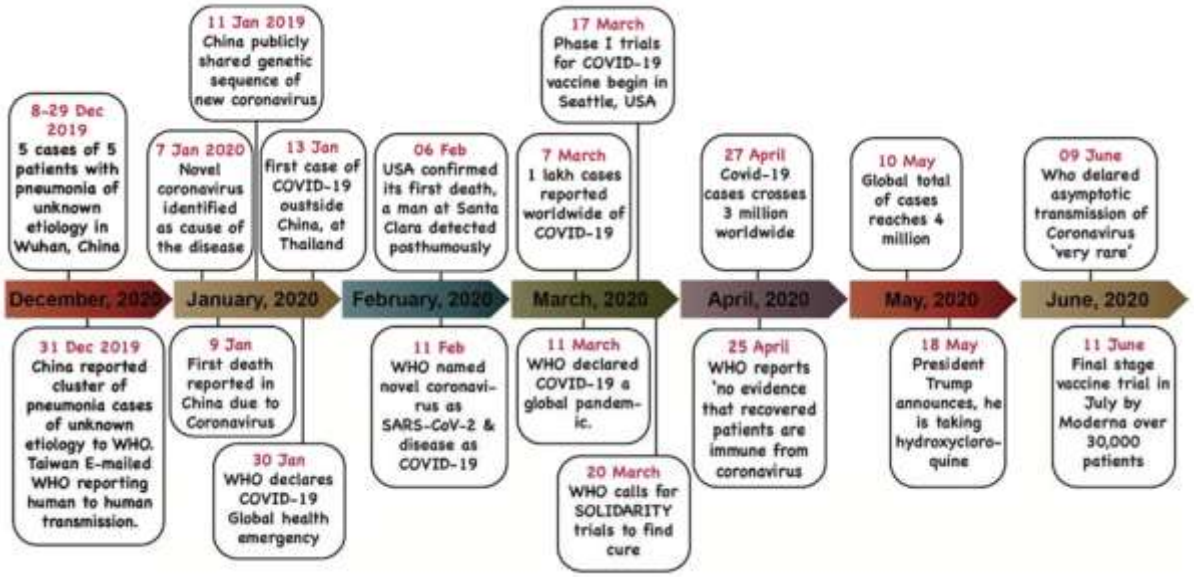

Figure: 3 Major Event of current coronavirous COVID-19 disease outbreak.

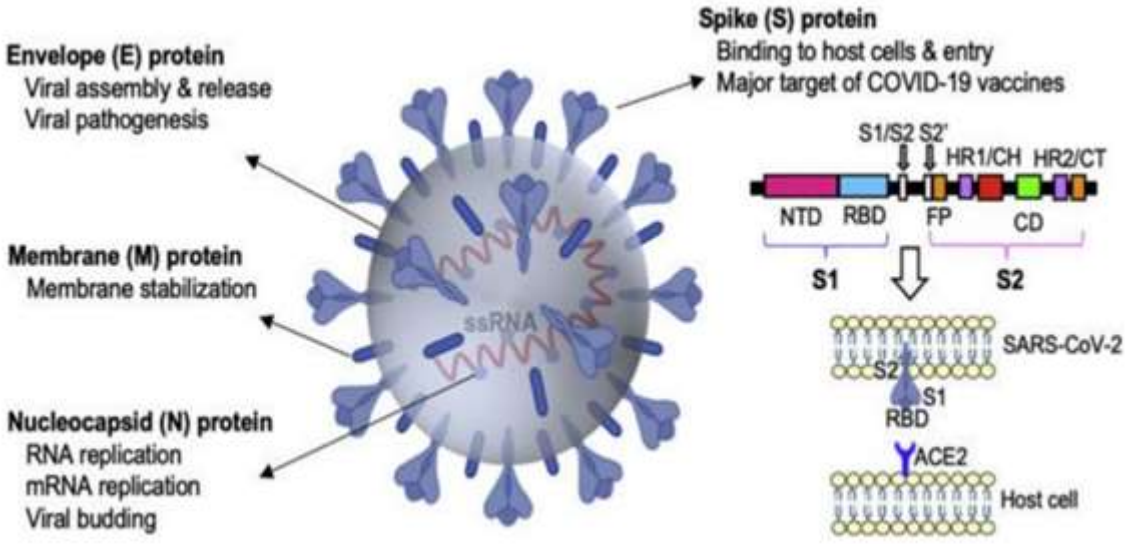

Figure: 4 Structure of SARS-CoV-2

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