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Coronavirus (COVID-19): Novel, Facts, Myths, immune system, and Corona Vaccine Types

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ABSTRACT

Humans and animals both have illnesses that can make them unwell. Allergy discomfort is frequently caused by skin diseases. they believe that they can be used to classify which patients are likely to survive the sickness. All patients with convalescent covid-19 and those who did not survive were properly classified using the biomarkers. COVID-19 is a program that aims to protect the welfare of animals and animal products in China. No meat, meat products in luggage, eggs, or milk products are permitted because they pose a threat to the health of the animals. The European Union has agreed not to allow any animals or animal products into the if they are transported from China.

INTRODUCTION

SARS-CoV-2 was discovered in people for the first time in China and had never been previously reported. In 2019, the new coronavirus was renamed SARS-2 coronaviruses (SARS CoVs-2) With a genomic size of 27 to 34 kilobases with a "crown" or "halo" form, SARS CoVs-2 was the first coronavirus to be discovered in humans. (Seen using two-dimensional transmission electron microscopy) (the largest of known RNA viruses) Some of the virus's proteins may have caused the illness, based on the club-shaped protein spikes that coat the surface (Abdulbaqi *et al.*, 2018; Dahham et al, 2019 and Al-Tekreeti *et al.*, 2017) as shown in figure (1).

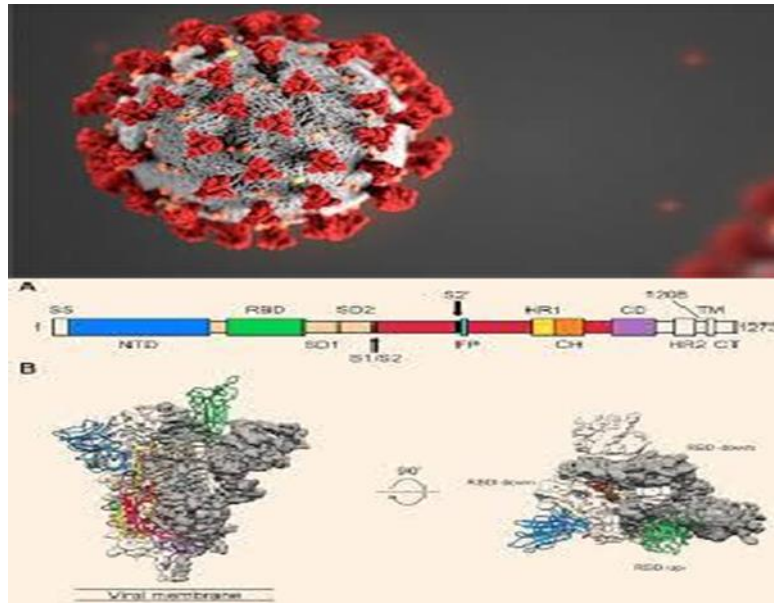


Fig.1: Novel Coronavirus (COVID-19) under two-dimensional transmission electron microscopy.

History:

as shown in figure (2) Coronaviruses were identified in the 1960s and 1970s. In 2003, two viruses (human coronavirus 229E and OC43) were discovered in poultry from the nasal passages of human patients with the

common cold (Hong Kong and China epidemic HCoV NL63 in 2004 HKU1 in 2005 MERS-CoV in 2012, SARS-CoV-2 in 2019, SARS-CoV-2 in 2019; Drexler *et al.*, 2010 and woo *et al.*, 2010).

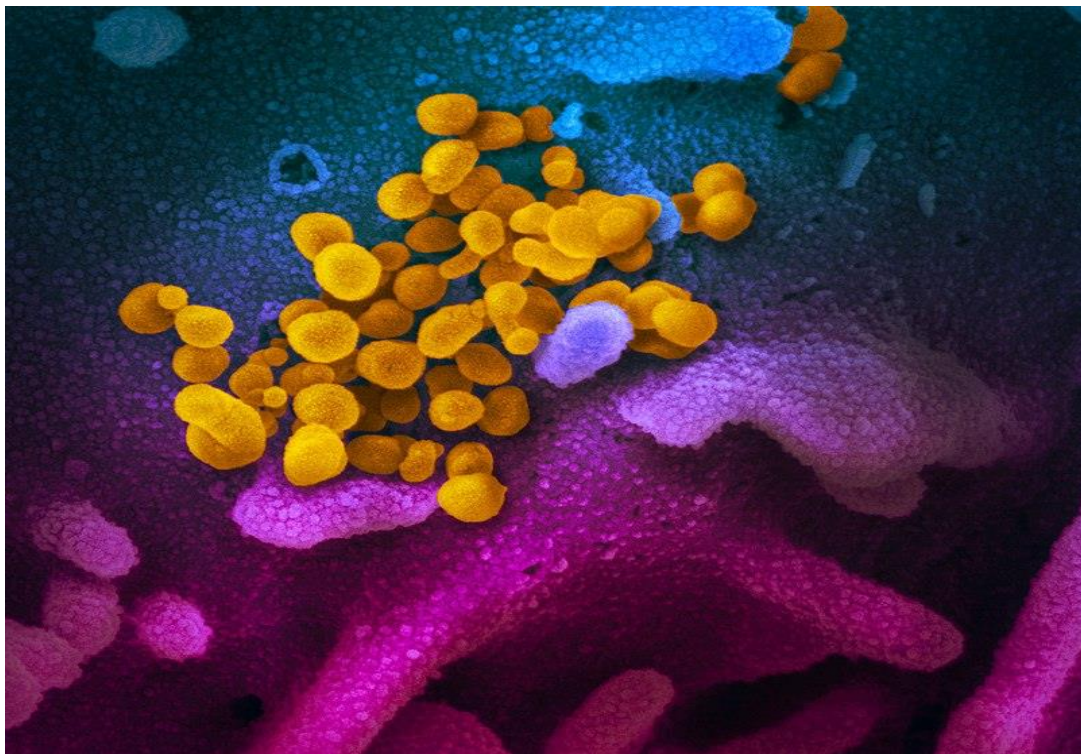


Fig. 2: Coronavirus electron microscope image.

The initial epidemic of the illness occurred at Wuhan Seafood Market in Wuhan, China. Bangkok, Tokyo, Beijing, Seoul, Shanghai, Guangdong, Hong Kong, Macau, Vietnam, Everett, and Singapore were among the cities where the virus spread this comes as a global census revealed that up to the beginning of 2021, more than 58.14 million people were afflicted with the developing coronavirus, with total fatalities estimated at 58.14 million (Azziz *et al.*, 2006 and Hammadi *et al.*, 2019).

Clinical Features and Sequelae:

With common coronaviruses, human infections are occasionally mild and often asymptomatic. MERS-CoV causes fever, coughing, and shortness of breath as symptoms (2012). In individuals with pneumonia, viruses can cause more severe lower respiratory tract infections. Individuals with weak immune systems, those with cardiovascular problems, the elderly, and smokers are all in danger.

Epidemiology and Statistics:

Coronaviruses have been identified in bats all over the world, and they may play an important role in the virus's spread. Certain animal species may also act as hosts and reservoirs for other animals. SARS-COV incubation time varies from 3 to 10 days, MERS-COV up to 14 days, and SARS-COV-2 incubation period varies from 14 to 21 days (Peiris, *et al.*, 2003).

According to a global census, the coronavirus infected more than 58.14 million individuals till the beginning of 2021. One million and 381424 people died as a result of the illness.

Coughing or sneezing droplets, contact with contaminated things or buildings, and personal contact such as touching or kissing are all ways in which an infected individual might infect others in humans (Hussein *et al.*, 2019 and Nouri *et al.*, 2015) as shown in figure (3).

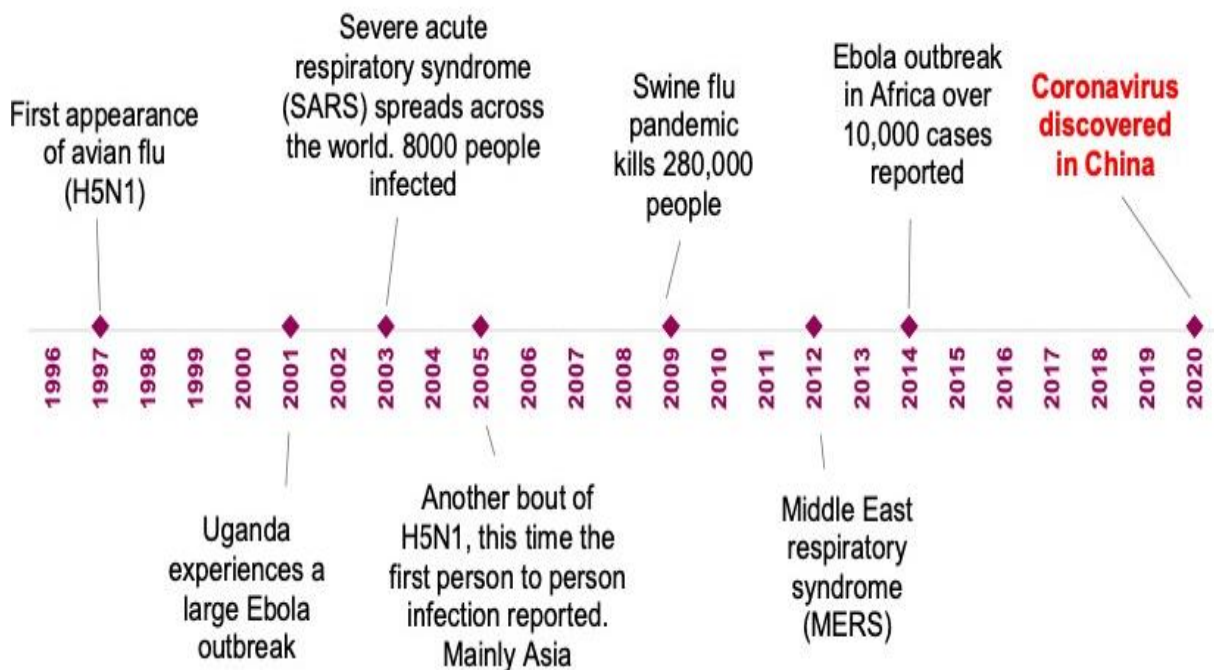


Fig. 3: Pandemics in recent history

Diagnosis:

A second targeted RT-PCR test targeting a particular gene and/or a clinical sample from a different anatomical site should confirm a negative result in a patient with a high epidemiological or therapeutic suspicion of disease. Simple preventative measures include proper respiratory hygiene, respiratory etiquette, and regular attentive face washing.

COVID-19 and Animals and Food Products:

Any of the animals or animal products authorized for entrance into the European Union pose no threat to COVID-19's welfare in China. COVID-19 transmission by food has not been documented; nevertheless, because travelers are the primary route of transmission, no meat, meat products in luggage, eggs, or milk products are permitted (Yin, *et al.*, 2018) as shown in figure (4).

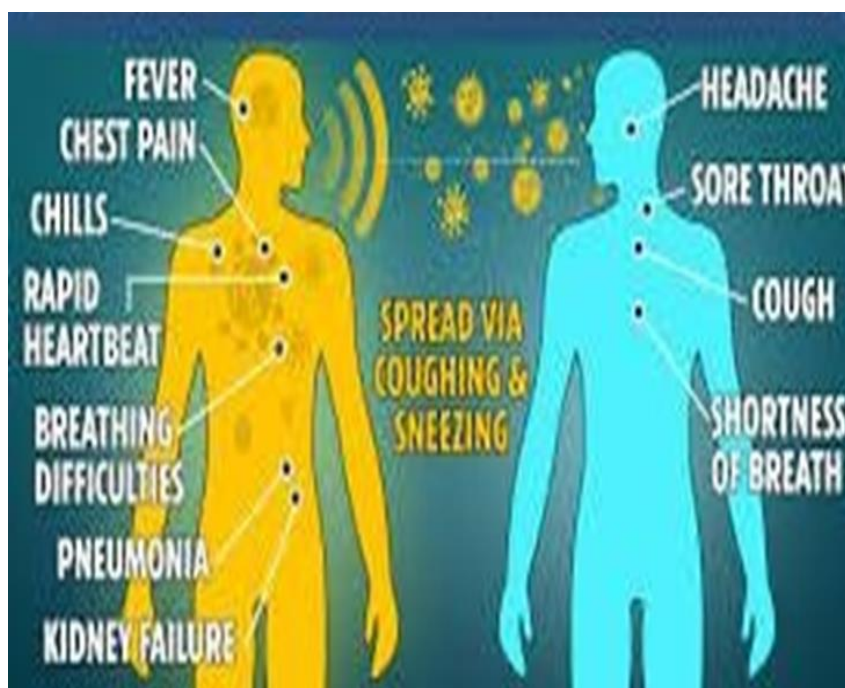


Fig.4: the symptoms of 2019-nCoV and how it spreads

Persistence Of Coronavirus on Inanimate Surfaces:

"Ensure that environmental cleaning and disinfection protocols are followed," the WHO advises. In the disinfection of tiny surfaces, ethanol (62e71 percent) showed comparable coronavirus effectiveness. Alcohol-based hand rubs should be used for hand disinfection, and gloves should be used if possible. Hand hygiene compliance may be considerably higher in an epidemic situation, but it is also likely to be significantly lower (Azziz *et al.*, 2006 and Hammadi *et al.*, 2019).

The Effect of Coronavirus on Kidney Function:

The Covidye virus may directly infect human extrapulmonary organs and tissues or cause hyper inflammation mediated by cytokine release, resulting in various organ dysfunctions such as acute kidney injury (AKI), and acute liver injury (ALI), or coagulopathy. The importance of early examination and monitoring of liver and renal functions, as well as hematologic markers, in predicting the development of the disease cannot be overstated.

Kidney Involvement in Covid-19:

In the presence of SARS-CoV-2 viraemia, the kidneys, ileum, and heart may be impacted. The lungs, heart, and pancreas all have lower ACE2 activity than the kidneys. Local kidney ACE2 levels rise with renal disease, indicating that tubular cells, which make up 90% of the kidney mass, are more active. The brush boundary of proximal tubular cell CD147 is where ACE2 is most commonly seen. It's possible that this is the most important receptor for kidney involvement of the virus.

The Effect of Corona Virus on Liver Function:

In 2010, 2 million people died worldwide as a result of liver disease. Cirrhosis is a late stage of chronic liver disease that is typically preceded by hepatocellular necrosis and increasing fibrosis, both of which are caused by a variety of factors such as viral infections and persistent alcohol consumption. Alcoholic hepatitis is a condition of the liver caused by drinking alcohol. The primary aetiologies of liver cirrhosis have been found to include nonalcoholic steatohepatitis and hepatitis B and C, with an up to 80% death rate recorded one year following decompensation. SARS-CoV-2 (COVID-19) was initially identified in December 2019, with a probable source in China's Wuhan seafood market. It has infected 896,450 individuals and killed 45,525 people throughout the world (Dheeb *et al.*, 2015; Hussein *et al.*, 2019 and Nouri *et al.*, 2015)

COVID-19 is a coronavirus, a kind of RNA virus with the biggest genome of all known RNA viruses. It is seen in people, mice, pigs, cats, dogs, and other animals. In extreme situations, it can result in respiratory distress syndrome (ARDS), multiple organ failure (MOF), and death. Hypertension is by far the most prevalent comorbidity. Diabetes, heart disease, and cancer are just a few of the ailments that people suffer from. In individuals with COPD or a history of smoking who were infected with SARS-CoV-2, researchers looked at the effects of smoking status and chronic obstructive pulmonary

disease (COPD). There was no mention of the virus posing a risk to people who had had liver or kidney problems in the past (Drexler *et al.*, 2010 and woo *et al.*, 2010).

Coronavirus from Sars to Mers:

According to Zain Verjee, SARS-CoV had a 10% death rate and infected 8,000 people over the course of an eight-month outbreak in 2002-2003. MERS-Cov expanded to 27 countries with a 35.6 percent death rate in 2,220 cases. COVID-19, which is generated from Wuhan, has similar dynamics. This illness has a current fatality rate of about 2%. Secondary infections acquired through Hospital have been found in all three pathogens. There are no reports of medicine that are shown to be beneficial in treating a specific condition (Abdulbaqi *et al.*, 2018; Hussein *et al.*, 2019; Nouri *et al.*, 2015 and Hussain *et al.*, 2017)

Relationship between the ABO Blood Group and the COVID-19 Susceptibility:

The novel coronavirus disease-2019 (COVID-19) has spread throughout the world and has been labeled a pandemic by the World Health Organization. When compared to non-A blood types, blood group A was associated with a higher chance of getting the condition. This is the first time a link between ABO and the -19-blood type has been discovered. Human coronaviruses can stay infectious on inanimate surfaces for up to 9 days at room temperature. The period of persistence is shorter at a temperature of 30°C or higher. SARS-CoV had a ten percent death rate and infected 8,000 persons over the course of an eight-month outbreak in 2002-2003. MERS-Cov had a death rate of 35.6% in 2012, with 2220 patients scattered across 27 countries. According to the World Health Organization, environmental mental cleansing and disinfection should be done on a regular and appropriate basis. There has been no evidence discovered to explain the incidence of coronavirus-infected hands or viral load on the hands. Alcohol-based hand rubbing is a superior option for hand disinfection.

COVID-19 and Pregnancy

During an eight-month outbreak in 2002-2003, SARS-CoV caused a 10% death

rate and infected 8,000 individuals. MERS-Cov expanded to 27 countries in 2012 after 2220 cases with a 35.6 percent death rate. SARS-infected pregnant women have a death risk of above 25% [39,40]. Susceptibility to SARS-COV-2 infection and the likelihood of severe illness in females who are nursing is increased (Drexler *et al.*, 2010 and woo *et al.*, 2010).

COVID-19 and Smoking:

Smokers are twice as likely as non-smokers to have influenza and have more severe symptoms. Smoking also has an impact on the immune system and how it responds to infections, making smokers more vulnerable to infectious illnesses. Because of the large number of persons who smoked during the pandemic, the MERS-COV outbreak has been connected to smoking (Al-Tekreeti *et al.*, 2017; El-Hilali *et al.*, 2016 and Bander *et al.*, 2015).

COVID-19 Infection in People with Diabetes:

Diabetes increases the chance of COVID-19 infection, hospitalization, and death. In terms of both cytokine profiles and immunological activities, such as T-cell activation and macrophage activation, people with diabetes have an impaired immune response to infection. When contaminated with whey protein, many diabetic individuals in China are prone to experience metabolic dysfunction (Zaki *et al.*, 2012).

Respiratory Viral Infection and COVID-19:

Acute respiratory tract infection is a concern for those with serum 25(OH)D levels of 38ng/mL (95nmol/L) or above (ARI) When compared to children with moderate ARI, those who required hospitalization had a severe 1.7 times higher incidence of vitamin D insufficiency. As soon as possible following their hospitalization, all patients should receive at least one regular dosage of 50,000 vitamin D. Drisdol is a pediatric formulation containing 8000 IUs per mL of liquid vitamin D2.

How Does the Immune System Respond to A Coronavirus Attack?

The first line of defense against the new coronavirus is the 'innate immunological response.' It is the body's general response to any illness or invading organism that it is unfamiliar with. The spike proteins are able to gain entrance into lung cells by freeing the ACE2 protein. When they come, they take over the cell's machinery, reproduce and proliferate nearby cells, and infect them. The infection induces a build-up of fluid in the lungs, which contributes to a dry cough. (Dheeb *et al.*, 2015 and Dheeb *et al.*, 2014)

Immunological Indicators Related to Coronavirus:

Five SARS-CoV-2 coronavirus biomarkers have been discovered by scientists at the University of Washington's Washington School. All patients with convalescent COVID-19 and those who did not survive could be properly classified using biomarkers. A cohort of 22 people was studied, 12 of whom lived and ten of whom died. Humoral immune response was seen in the recovered individuals, which mostly responded to the protein Spike (S) The immunodominance of the deceased people had shifted in such a way that the N protein elicited a stronger immune response. This immune system alteration indicated whether the person was regenerating or dying.

Corona Vaccine Types:

Vaccination, more than ever, is a safe and efficient approach to preventing disease and saving lives. At least 20 illnesses are protected by vaccinations, including diphtheria, tetanus, pertussis, influenza, and measles. Every year, these vaccinations help to save the lives of up to 3 million individuals. Some people are recommended not to obtain particular vaccinations.

How Does a Vaccine work?

Vaccines interact with your body's natural defenses to create immunity, lowering your chance of contracting a disease. Your immune system recognizes the invading germ and generates antibodies in response to the vaccination. Antibodies are proteins that the immune system produces spontaneously to combat illness. We are usually protected

against a disease for years after being exposed to one or more doses of vaccination.

How Do Vaccines Protect Individuals and Communities?

Vaccines function by conditioning the immune system to fight microorganisms that cause illness (Drexler *et al.*,2010 and woo *et al.*, 2010). A person's risk of infection is lowered when they are immunized against the disease. They're also less likely to spread the virus or bacterium to others as a result. Lowering the risk of a disease spreading in the population protects individuals who cannot be vaccinated (due to health reasons, for example).

Types of Vaccines:

The Covid 19 vaccination protects against Covid symptoms 95% of the time. Virus number 19 The Pfizer-Bionic vaccine is recommended for persons aged 16 and up and requires two shots separated by 21 days. The Moderna vaccine is 94% effective and requires two injections 28 days apart. If necessary, a second dose can be given up to six weeks after the first.

In clinical studies, the Janssen/Johnson & Johnson Covid 19 vaccine was 66 percent effective in preventing symptomatic infection 14 days after immunization. The Coronavirus has been inactivated in the laboratory and is included in the Sinovac vaccine CoronaVac. Our bodies identify that the protein isn't supposed to be there and create T-lymphocytes and antibodies to recall how it got there. to fight the virus that causes COVID-19 if we are infected in the future (Drexler *et al.*,2010 and woo *et al.*, 2010)

The Vaccine Consisted of:

Pfizer-Bionic is developing an "RNA" vaccination for Covid 19, which contains genetic information about the disease and causes the body to manufacture a protein that the virus utilizes to enter cells. The goal of the vaccine is to get the body to make antibodies against this protein, which will stop viruses from entering cells and multiplying. Some vaccinations are not preservative-free, because they are stored in vials and disposed of after the administration

of a single dose (Nouri *et al.*, 2015; Hussain *et al.*, 2017 and Dheeb *et al.*, 2014) The Sinovac vaccination works by exposing the immune system to dead virus particles without generating a harmful reaction. The vaccines developed by Pfizer and Moderna are based on messenger RNA, a technology that is being utilized in people for the first time. The vaccine produced by Janssen/Johnson & Johnson uses a medically recognized method known as a viral vector. Moderna vaccine should be kept at -20 degrees Celsius and should not be used (Abdulbaqi *et al.*, 2018 and Dahham *et al.*, 2019).

CONCLUSIONS

Despite significant differences in the first symptoms, the majority of COVID-CoV-19 patients experience fever and respiratory difficulties. For the time being, all patients with flu-like symptoms should have their travel history to epidemic regions recorded. Security procedures should be taken since frontline emergency workers are in danger. While vaccine and antiviral studies are continuing, primary care is still the priority.

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