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A Review: Novel Coronavirus

Shrishti Dubey
1st year MBBS student of Datta Meghe medical college, Nagpur

Nandkishor Bankar
Associate Professor Dept. of Microbiology Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences Sawangi (Meghe), Wardha

Manju Chandankhede
Associate Professor and HOD Dept. of Biochemistry Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre, Nagpur

***Abstract*---**In late 2019, December coronaviruses were identified in china causing respiratory tract disease. SARS-CoV-2 was the name given to the triggering virus, and COVID-19, or novel coronaviruse-19, was given to the disease. Since the genome sequencing of SARS-CoV-2 is identical to bat CoV RaTG13, this strain is most likely from bats. To lower the rate of transmission people should avoid public gathering, wear masks, self-hygiene is must. Cold, cough and fever are the early symptoms of the infection. If a person is sick should start self-quarantine in the house itself or consult to the doctor for further diagnosis of COVID-19 disease. RT-PCR and CT scan are the best methods to detect the virus in the body. If the person is infected sever it might take longer time for the recovery and called long-COVID-19. Vaccinations have been started in the countries to reduce the effect of virus and decrease the transmission of virus.

***Keywords*---**COVID-19, CoV RaTG13, RT-PCR and CT.

Introduction

Coronavirus are caused by a large family of coronaviruses which causes illness ranging from the common cold to more severe diseases. The first case present of coronavirus over the world was seen on 17thNovember, 2019 to a 55-year-old individual in town of Wuhan, china and reported by china to the office of WHO on 31st December 2019. In India first case is seen in Thrissur, Kerala to a 20-year-old female on 27th January 2020. A few days later the unknown pneumonia is identified as novel coronavirus (nCoV) by several laboratories. It is also known as extreme acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or middle east

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***Corresponding author**: Bankar, N.*
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respiratory syndrome (MERS) in the short term, and the World Health Organization has designated it coronavirus disease 2019 (COVID-19) (WHO). [1-2]

History

The first mention of coronavirus in North America came in the late 1920s, when a domesticated chicken developed an acute respiratory infection. Then, in 1931, Arthur Schalk and M.C. Hawn published the first brief study in North Dakota about a new respiratory infection in chickens. The virus that causes the infection was isolated in 1933 by Leland David Bushnell and Carl Alfred Brandly, and it was first cultivated in 1937 by Charles D. Hudson and Fred Robert Beaudette. Infection bronchitis virus (IBV) was the virus's original name, but it was later renamed Avian coronavirus. [3-6]

JHM and MHV, two more animal coronaviruses, were identified in the late 1940s. JHM causes a brain condition in mice called murine encephalomyelitis, which was discovered at Harvard Medical School in Boston (after Harvard Pathologist John Howard Mueller). The National Institute for Medical Research in London announced a new mouse hepatitis after three years. MHV was identified as the causative virus (mouse hepatitis virus). Nobody knew at the time that these three viruses were linked to one another. [7-9] A significant number of animal coronaviruses have been identified since the 1960s. [9]

In the 1960s, the United Kingdom and the United States used two different methods to discover human coronaviruses. E.C Kendall, Malcolm Bynoe, and David Tyrrell worked at the British Medical Council's influenza virus unit, where they received B814 from a schoolboy with a common cold in Epsom, England in 1961, which was confirmed in 1965. Dorothy Hamre and John Procknow collected a common cold sample from a University of Chicago medical student in 1962. The virus was isolated, grown in tissue culture, and given the name 229E. [11-13]

In 1967, researchers at St. Thomas Hospital in London compared the configurations of three viruses: IBV, B814, and 229E, using an electron microscope. They have been discovered to be morphologically similar in terms of shape and character club-like spikes. [14, 15,] A study was conducted at the National Institute of Health the same year, and they were able to collect another member of this emerging community of viruses known as OC43.[16]

The OC43, including IBV, 229E, and B814, have investigated and seen club-like spikes. Because of their distinct morphological appearance, this new group of viruses was given the name coronaviruses. The B814 strain lost and 229E and OC43 human coronaviruses continued to subsequent decades. In 2003 SARS-CoV and HCoVNL63, in 2004 HCoVHKU1, in 2013 MERS-CoV human coronaviruses are known. In 2019 in Wuhan, china in a 55-year-old suffers from common cold and further diagnosed by SARS-CoV-2 or COVID-19. [16-18]

Origin and spread

At the end of 2019, in December scientists identified a coronavirus outbreak began in Wuhan, a city in the Hubei region in china. Coronaviruses are very common in the animal for example in cattle and camels but the transmission in human is very rare. This new strain is likely to come from bats. The recently discovered virus, extreme acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as well as the illness it causes, have been given the names coronavirus disease 19 and SARS-CoV-2, respectively (COVID-19). SARS-CoV-2 is a beta-coronavirus with non-segmented positive-sense RNA that is structurally enveloped. Beta-CoV, SARS-CoV, and MERS-CoV are three of the four genera of human Coronavirus that cause serious and potentially fatal respiratory tract infection. The genome sequence of SARS-CoV-2 was discovered to be similar to that of bat CoV RaTG13. As a result, it's thought that the bat is the virus's natural host. However, the exact location of the virus's first human transmission has yet to be determined.[19-20]

SARS-CoV-2 is a transmission virus which spread from person to person through close communities and cause COVID-19. By 23rdJanuary, 11 million population of Wuhan were lockdown so that the virus doesn't spread. The curfew was quickly expanded to other cities in the Hubei area. Cases of covid-19 have been identified in other countries where there is no history of travel from China, implying that local human transmission has occurred. Soon after, screening systems were installed at airports to recognise symptomatic people returning from China, who were then isolated and tested for COVID-19. It was discovered that the virus can be transmitted from an asymptomatic individual as well as before symptoms appear. There was a rapid rise in COVID-19 cases all over the world after that. [21-22]

Clinical features

The impact of the Coronavirus varies from person to person. The majority of people who get a mild infection can recover without going to the hospital, but a serious infection can lead to death. Loss of smell and taste, headaches, coughs, runny noses, fevers, diarrhoea, breathing problems, and chest pain are all common symptoms. The signs and symptoms differ over time. Respiratory symptoms, musculoskeletal symptoms, and digestive symptoms are the three most common clusters of symptoms. [23-24]

The majority of people experience mild to moderate signs. Extreme symptoms affect 14% of people, while vital symptoms affect 5%. Some people do not have any symptoms, and these asymptomatic carriers do not get screened, allowing the virus to spread. Other infected individuals will experience symptoms later, referred to as "pre-symptomatic" or "mild" symptoms, and transmit the virus to others. On average it takes 5 to 6 days to show symptoms from when the person gets infected and it can also take 14 days. [25-27] It has been observed that in long COVID-19 the organ is damaged.[28]

The following are the most common symptoms	fever dry cough tiredness
Less common that are symptoms:	pains and aches diarrhoea conjunctivitis sore throat a headache, a change of taste, or a lost of smell a patch or discoloration of the fingers or toes on the skin
Serious that are symptoms:	difficulty breathing or shortness of breath chest pain or pressure loss of speech or movement

Diagnosis

If a person develops symptoms of COVID-19 disease or being in contact with a COVID-19 patient should contact to the doctor. Factors used to decide that test should or should not be conducted depending on the area you live or how you were exposed to the COVID-19 patient and symptoms seen in the body.

RT-PCR test was used to validate COVID-19. Chest CT scans, in addition to laboratory tests, can be useful in determining the extent of the lungs infection. Past infection was detected using a serological test, which detects antibodies released by the body in response to infection. [29-30]

Treatment

The disease caused by the SARS-CoV-2 virus, coronavirus disease 2019 (COVID-19), has no specific, successful treatment. As a result, care involves symptom relief, fluid therapy, oxygen support, and prone positioning as required, as well as drugs or devices to support other vital organs that have been damaged. Paracetamol or NSAIDs were given to patients with mild symptoms to relief from fever, body aches and cough. It is also recommended to maintain good personal hygiene. The CDC recommend to were mask and isolate people who suspects to carry the virus. [28, 31-31]

Dexamethasone, a glucocorticoid, is used to treat extreme cases with hypoxia since it lowers the risk of death. Noninvasive ventilation or mechanical ventilation are needed for breathing support. While ECMO (extracorporeal membrane oxygenation) is used to treat respiratory failure, its benefits are still being debated. [32-35]

Clinical studies were conducted on a number of experimental therapies. Despite continued research, there is still a lack of high-quality evidence to support the recommendation of "early treatment." Two monoclonal antibody-based therapies are available in the United States for use early in cases with a high risk of severe disease progression. The antiviral remdesivir is available with restrictions in many

countries, but it is not approved for people who need mechanical ventilation and is discouraged by WHO due to a lack of efficacy proof (world health organization). [36-37]

Prevention

The precautions to take to avoid contracting or transmitting SARS-CoV-2.
A) Washing hand frequently and carefully with the warm water and soap rubbing your hand at least 20 seconds.
B) Avoid touching face including mouth, nose and eyes this can give chance to go viruses from hand to body as virus can live 72 hours on the surface.
C) Stop coming in contact with people as virus can transmit while shaking and hugging people. Maintain social distancing.
D) When sneezing or coughing, cover your mouth and nose.
E) Scrub hard surfaces in your home with alcohol-based disinfectants.
F) Do not eat or drink in public areas.
G) Put on a Mask: The Centers for Disease Control and Prevention (CDC) advises wearing a mask in public places where physical separation is difficult. The virus's spread will be slowed. A child under the age of two should not wear a mask.
H) Self quarantine if you see any symptoms.
Taking the prevention will allows you to prevent the spread of viruses and other infection. [38-39]

A COVID-19 vaccine provides acquired immunity against the virus that triggers corona virus disease 2019 (COVID19), also known as corona virus 2 (EARS) (SARSCoV2). In a phase 3 trial, some COVID vaccines showed efficacy of up to 95% in preventing symptomatic COVID-19 infection. By December 2020, countries had preordered more than 10 billion vaccine doses, with about half of those doses bought by high-income nations, which account for 14% of the global population. [40]

Conclusion

COVID-19, also known as novel corona viruses, was reported a pandemic by the World Health Organization on March 11, 2020 (world health organization). Virus infect the lung of the infected person as it is associated with respiratory tract disease which causes difficulty in breathing. The most common symptoms are cold and fever. Wearing mask, social distancing and self-hygiene is the best prevention you can have to avoid transmission of COVID-19 disease. Vaccination decreases the effect of virus and leads to less infection so chances of recovery is faster as compare to non-vaccinated person.

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