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A REVIEW OF CORONAVIRUSE DISEASE

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Abstract: The outbreak of coronavirus disease caused by severe acute respiratory syndrome coronavirus 2 is declared pandemic by World Health Organization keeping in view its infection rate and toxicity level. The entire world is struggling hard to survive the prevailing health emergency.Since its emergence in December 2019, corona virus disease 2019–COVID-19 has impacted several countries. The routes of transmission are direct contact, and droplet and possible aerosol transmissions.

This review aimed at binding all the scattered data and research available till now on COVID-19 disease starting from its origin to transmission and spread through environmental factors till treatment and the safety measures that should be implemented. This article would possibly help the readers by providing an outlook of current scenario on various perspectives of COVID-19 disease at a single glance.

IndexTerms **- COVID-19, pandemic, toxicity, transmission, Aerosol.**

INTRODUCTION

Corona viruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome. The most recently discovered coronavirus causes coronavirus disease COVID-19.Coronavirus disease-COVID-19 is an infectious disease caused by the SARS-CoV-2 virus.The novel human coronavirus disease COVID-19 has become the fifth documented pandemic since 1918 flu pandemic. COVID-19 was first reported in Wuhan, China in 2019 and subsequently spread worldwide. It is primarily spread person to person by small droplets, or by contact with contaminated surfaces. Maintaining social distancing and maximizing personal hygiene levels reduces the risk of transmitting the virus, as well as reducing your risk of getting infected.

COVID-19

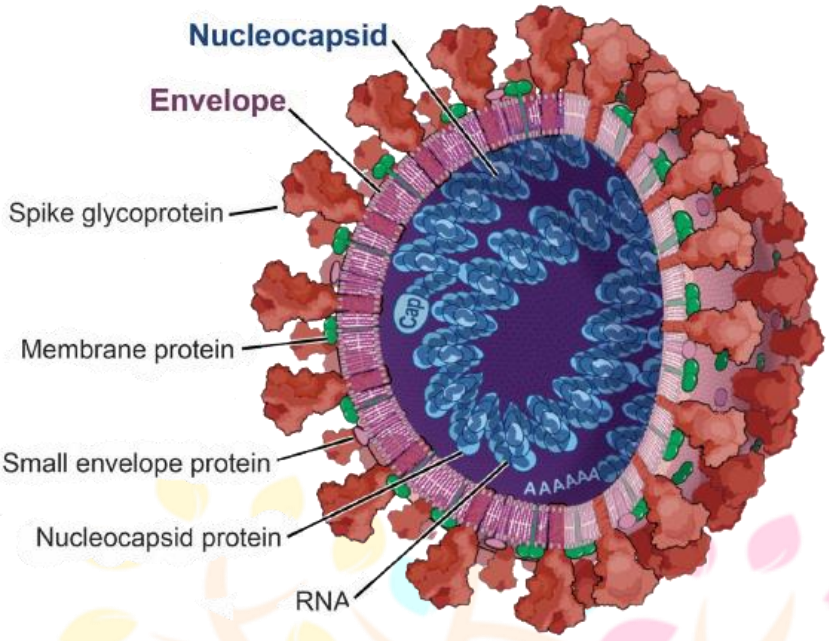

fig. structure of corona viruse

CAUSES

Infection with severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, causes coronavirus disease 2019 COVID-19. The virus that causes COVID-19 spreads easily among people. Data has shown that the COVID-19 virus spreads mainly from person to person among those in close contact. The virus spreads by respiratory droplets released when someone with the virus coughs, sneezes, breathes, sings or talks. These droplets can be inhaled or land in the mouth, nose or eyes of a person nearby.

Sometimes the COVID-19 virus can spread when a person is exposed to very small droplets or aerosols that stay in the air for several minutes or hours called airborne transmission. The virus can also spread if you touch a surface with the virus on it and then touch your mouth, nose or eyes. But the risk is low.

The COVID-19 virus can spread from someone who is infected but has no symptoms. This is called asymptomatic transmission. The COVID-19 virus can also spread from someone who is infected but hasn't developed symptoms yet. This is called presymptomatic transmission.

It's possible to get COVID-19 more than once. When a virus has one or more new mutations it's called a variant of the original virus. People who are fully vaccinated can get breakthrough infections and spread the virus to others. But the COVID-19 vaccines are effective at preventing severe illness. This variant also reduces the effectiveness of some monoclonal antibody treatments.

In April, the CDC downgraded the delta variant from a variant of concern to a variant being monitored.

SYMPTOMS

Signs and symptoms of coronavirus disease 2019 - COVID-19 may appear 2 to 14 days after exposure. This time after exposure and before having symptoms is called the incubation period. You can still spread COVID-19 before you have symptoms presymptomatic transmission. Common signs and symptoms can include:

- Fever
- Cough
- Early symptoms of COVID-19 may include a loss of taste or smell.
- Shortness of breath or difficulty breathing
- Muscle aches
- Chills
- Sore throat
- Runny nose
- Headache
- Chest pain
- Pink eye

- Nausea
- Vomiting
- Diarrhea
- Rash

The severity of COVID-19 symptoms can range from very mild to severe. Some people may have only a few symptoms. Some people may have no symptoms at all, but can still spread it asymptomatic transmission

People who are older have a higher risk of serious illness from COVID-19, and the risk increases with age. People who have existing medical conditions also may have a higher risk of serious illness. Certain medical conditions that may increase the risk of serious illness from COVID-19 include:

- Serious heart diseases, such as heart failure, coronary artery disease or cardiomyopathy
- Cancer
- Chronic obstructive pulmonary disease
- Type 1 or type 2 diabetes
- Overweight, obesity or severe obesity
- High blood pressure
- Chronic kidney disease
- Sickle cell disease or thalassemia
- Weakened immune system from solid organ transplants or bone marrow transplants
- Asthma
- Chronic lung diseases such as cystic fibrosis or pulmonary hypertension
- Liver disease
- Down syndrome
- Weakened immune system from bone marrow transplant, HIV or some medications
- Brain and nervous system conditions, such as strokes
- Substance use disorders

DIAGNOSIS

To test for the COVID-19 virus, a health care provider takes a sample from the nasopharyngeal swab, throat swab or saliva, RAT Test, nuclear acid Test, RT-PCR Test. The samples are then sent to a lab for testing. If you're coughing up sputum, that may be sent for testing. The FDA has authorized at-home tests for the COVID-19 virus.

1. NUCLEAR ACID TEST

A Nucleic Acid Amplification Test, or NAAT, is a type of viral diagnostic test for SARS-CoV-2, the virus that causes COVID-19. NAATs detect genetic material nucleic acids. NAATs for SARS-CoV-2 specifically identify the RNA - ribonucleic acid sequences that comprise the genetic material of the virus.

2. RAT TEST

A rapid antigen test, sometimes called a rapid antigen detection test, antigen rapid test, or loosely just a rapid test, is a rapid diagnostic test suitable for point-of-care testing that directly detects the presence or absence of an antigen.

3. RT-PCR TEST

Reverse transcription–polymerase chain reactio assay was developed to rapidly detect the severe acute respiratory syndrome–associated coronavirus. RT-PCR assay was more sensitive than a conventional RT-PCR assay or culture isolation and proved suitable to detect SARS-CoV in clinical specimens.

4. THROAT OR SALIVA SWAB

Instead of swabbing your inner cheeks and tongue, you may choose to swab the back of your throat and tonsils

TREATMENT

Treatments for COVID-19 vary depending on the severity of your symptoms. If you're not in the hospital or don't need supplemental oxygen, no specific antiviral or immunotherapy is recommended.

Depending on the severity of your COVID symptoms, you may need:

•Supplemental oxygen given through tubing inserted into your nostrils.
•Antiviral medications may reduce the risk of hospitalization and death in certain patients with COVID-19.
•Mechanical ventilation oxygen through a tube inserted down your trachea. You are given medications to keep you comfortable and sleepy as long as you're receiving oxygen through a ventilator.
•Extracorporeal membrane oxygenation . You continue to receive treatment while a machine pumps your blood outside your body. It takes over the function of your body's lungs and heart.

COVID-19 VACCINE AND VACCINATION

VACCINE

On 31 December 2020, the Pfizer COVID-19 vaccine was issued for emergency use listing by WHO.

1. REMEDESIVIR

Remdesivir, an inhibitor of the viral RNA-dependent, RNA polymerase with in vitro inhibitory activity against SARS-CoV-1 and the Middle East respiratory syndrome, 5-8 was identified early as a promising therapeutic candidate for Covid-19 because of its ability to inhibit SARS-CoV-2 in vitro.9 In addition, in nonhuman primate studies, remdesivir initiated 12 hours after inoculation with MERS-Co reduced lung virus levels and lung damage.

2. COVOSHIELD

It is a recombinant, replication-deficient chimpanzee adenovirus vector encoding the SARS-CoV-2 Spike glycoprotein. Following administration, the genetic material of part of corona virus is expressed which stimulates an immune response. Covishield is based on the viral vector platform, requiring first and second doses ideally administered anytime between 4-16 weeks, depending on the government allocated due date. There is no difference between the 1st and 2nd dose. Each dose has the same content of viral particles.

3. COVAXIN

BHARAT BIOTECH COVID-19 VACCINE is an inactivated vaccine, and hence, there is no chance of getting COVID-19. The Bharat Biotech COVID-19 Vaccine is administered to prevent Coronavirus Disease 2019 caused by SARS-CoV-2. The vaccine works by stimulating the immune system to produce antibodies against the inactivated SARS-CoV-2 strain. The vaccine is used, along with immune stimulants commonly known as vaccine adjuvants, to improve the immune response and provide longer-lasting immunity.
Compared to the Covaxin vaccination for Corona, the COVID vaccine Covishield has more side effects. The side effects such as headache, vomiting, nausea, and fever are also more intense. In very rare cases of 1 in 100,000 people, Covishield can also lead to blood clots.18-Apr-2022

VACCINE SUBTYPES

1. mRNA

BNT162b2/ Pfizer

This is a lipid nanoparticle–formulated, nucleoside-modified RNA vaccine that works against the S protein of the SARS-CoV-2 virus.

MRNA-1273/ Moderna

This is a lipid nanoparticle–encapsulated nucleoside-modified messenger RNA (mRNA)–based vaccine. It encodes the prefusion stabilised full-length spike protein of SARS-CoV-2. This spike glycoprotein moderates host cell attachments. Hence, it is essential for viral entry and thus the primary vaccine target.

2. ADENOVIRUSES

Viral vectors provide an avenue for vaccines. The vectors may generally be classified as replicating or non-replicating vectors. Adenoviruses are an example of vectors with both traits.12 This platform was explored by the Oxford/AstraZeneca vaccine and the Janssen Pharmaceuticals vaccine by Johnson & Johnson. Both these vaccines encode the S protein of the SARS-CoV-2 virus.

CONCLUSION

The current covid-19 pandemic clearly an internationally helath problem. There have been rapid advances in what we know about the pathogen, how it infect cells and causes disease and clinical characteristics of disease. Due to rapid transmission country around the world should increase attention into disease surveillance systems and scale up country readiness and response operations including estabilishing rapid response teams and improving the capacity of the national laboratory system.

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