

COVID-19: A Deadly Pandemic

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Abstract:- COVID-19 is a respiratory illness brought about by a new coronavirus. This paper discusses the structure of the virus, modes of transmission, pathophysiology, signs and symptoms and preventive measures by people from getting infected.

Keywords:- COVID-19; Pandemic; Social distancing; Sanitizer.

I. INTRODUCTION

Coronaviruses are a group of spherical or pleomorphic enveloped RNA viruses, carrying petal or club shaped peplomers on their surface. The name refers to the fringe of surface projections surrounding the virus, resembling the solar corona. Coronaviruses are established agents of diarrhea in calves, piglets and dogs. A few known coronaviruses are circling in creatures that have not yet contaminated people. On 31 December 2019, the WHO China Country Office was notified in Wuhan City, Hubei Province of China of cases of pneumonia of an unknown cause. On 7 January Chinese authorities isolated a novel coronavirus (COVID19) and identified it as the causative virus.

A. What is a novel coronavirus?

Coronaviruses (CoV) are a broad family of viruses that cause a wide range of diseases ranging from common cold to more severe diseases i.e., Middle East Respiratory Syndrome [MERS] and Severe Acute Respiratory Syndrome [SARS]

A novel coronavirus (nCoV) is a new strain not previously discovered in humans. The SARS-CoV-2 is a coronavirus which is very similar to the one causing SARS. There are four major coronavirus "ranks" (genera) which are called alpha, beta, delta, and gamma, based on their different characteristics. There is evidence that bats transmitted the SARS-CoV-2 too.

B. Why is the disease being called coronavirus disease 2019, COVID-19?

The World Health Organization declared on 11 February 2020 an official name for the disease that triggers the 2019 novel coronavirus outbreak, first detected in Wuhan China. Coronavirus disease 2019 is the current name for this disease, abbreviated as COVID-19. 'CO' stands in COVID-19 for 'corona,' 'VI' for 'virus,' and 'D' for sickness. This disease was formerly named "2019 novel coronavirus" or "2019-nCoV."

C. Structure of the SARS-Co V-2

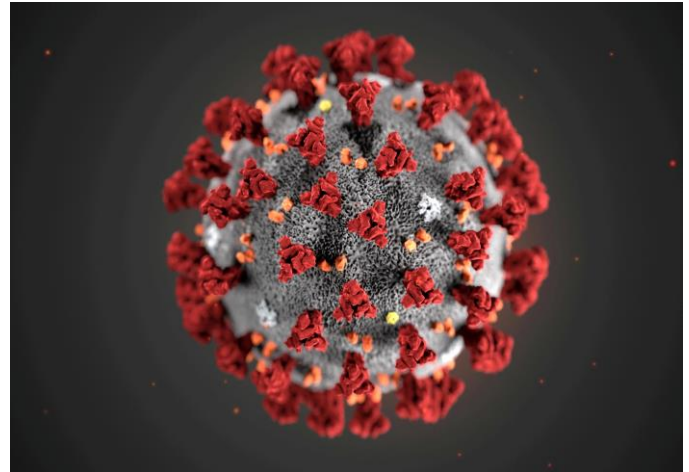


Fig 1:- The ultrastructural morphology of SARS-CoV-2 as seen in an illustration released on 29 January 2020 by the Centers for Disease Control and Prevention

Particles of the SARS-CoV-2 virus are spherical and have mushroom-shaped proteins called spikes from their surface, giving the particles a crown-like appearance. The spike binds and fuses to human cells, enabling the virus to invade. The novel coronavirus 'spike protein shares 98 per cent sequence similarity with the bat coronavirus' spike protein. The SARS-CoV-2 spike protein that triggers Coronavirus Disease 19 (COVID-19) binds to the cellular receptor called angiotensin-converting enzyme 2 (ACE2), which serves as the point of entry into human cells. But unlike SARS, the novel coronavirus' spike protein binds to the cell receptor with a much higher affinity — 10 to 20 times higher.

D. Incidence

The covid-19 has affected 209 countries and territories around the world and 2 international conveyances. Around 1,645,428 cases have been detected world wide, of which there are around 100,208 fatalities and 369,079 cases have recovered. India reports 7,347 cases and 229 deaths.

E. Incubation period

Recent estimates of the duration of virus incubation times: 1-12.5 days (median 5-6 days).

F. Modes of transmission

- Respiratory droplets from an infected person by coughing, sneezing or talking near a person (within 1 meter)
- These droplets can land in mouths or noses of individuals who are close by or breathed in lungs
- Close contact with infected person (touching, shaking hands)
- Touching virus-contaminated surfaces or objects and then touching your own mouth, nose, eyes
- Transmission from animals and human-to-human

G. Pathophysiology

Virus attaches to specific cellular receptors via specific viral

proteins

Transformational changes in the cellular membrane

Virus enters into the cell

Release of nucleocapsid into the cells

Alteration of host DNA and production of proteins for the virus

Alteration of cell function and production

Release of excess cytokines and chemokines like interleukines

Cytokine Storm Syndrome
(high fever, nausea, vomiting, low BP)

Hyperinflammation (high ESR, increased C-reactive protein)

Severe Acute Respiratory Distress Syndrome (SARS)
Fulminant myocarditis

May lead to death

H. Signs and symptoms

The COVID-19 signs occur within one to fourteen days after exposure:

- Fever
- Sneezing
- Headache
- Dry Cough
- Sore throat
- Difficulty in breathing
- Kidney failure

I. COVID-19 emergency warning signs

- Difficulty in breathing or shortness of breath
- Persistent pain or pressure in the chest
- Confusion or inability to arouse
- Bluish lips or face

J. Who can get infected?

Everyone is at risk of infection

- People living in or have recently traveled to any region with COVID-19 continuing active spread
- People who had close contact with a person who has laboratory confirmed or suspected case of COVID-19 virus
- Older adults above 65 years
- Living in a nursing home or residential treatment centre.
- People with chronic lung ailment or moderate to severe asthma
- People with serious heart problems
- All immunocompromised (including those under cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications)
- Extreme obese individuals (Body Mass Index [BMI] 40)
- Diabetes patients
- Those undergoing dialysis
- People suffering from liver disease

K. Prevention from COVID-19

- *Clean your hands regularly*
 - Wash your hands frequently with soap and water for in any event 20 seconds particularly after you have been in an open spot, or subsequent to cleaning out your nose, coughing, or sneezing.
 - If soap and water are not accessible promptly, use a hand sanitizer which contains 60 percent alcohol. Stretch and rub all surfaces of your hands together until they feel dry.
 - Abstain from contacting your eyes, nose, and mouth with unwashed hands.
- *Avoid close contact*
 - Restrict personal interaction with sick people.
 - Avoid crowded places and maintain a strategic distance from mass social occasions
 - Stay at home as much as possible.
 - Social distancing (physical distancing): Keep at least 2 meters (6 feet) away from other people.
 - ✓ Few people who do not show symptoms might be able to spread the infection
 - ✓ Maintaining distance from others is particularly significant for individuals who are at higher danger of becoming ill.
- *Cover your mouth and nose with a mask on your face while you are around others*
 - You could spread COVID-19 to others even if you do not feel sick.
 - The Centers for Disease Control and Prevention (CDC) recommends that everybody should wear a cloth face cover once they need to venture out publically, for instance to the market or to choose up other necessities.

- Cloth face covers should not be put on young children under the age of 2, anyone has difficulty breathing or who is unconscious, injured or otherwise unable to remove the mask without support.
 - The cloth face cover is meant to protect other people in case you are infected.
 - Don't use a facemask that is meant for a healthcare worker (i.e. surgical masks and N95 respirators)
 - Continue to keep between yourself and others for about 6 feet. The cloth face cover is no replacement for social distancing.
- *Cover coughs and sneezes*
- If you're in a private place and don't have facial covering, note to always cover your mouth and nose with tissue when you cough or sneeze or use crook of your elbow.
 - Discard soiled tissues in the refuse.
 - Right away wash your hands for at least 20 seconds with soap and water. If soap and water are not readily available, use a hand sanitizer that contains at least 60 per cent alcohol to clean your hands.
- *Clean and disinfect*
- Frequently touched surfaces need to be cleaned and disinfected daily. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
 - Clean the surfaces if they are dirty: Use detergent or soap and water before disinfection.
 - Add 5 table spoons (1/3rd cup) of bleach per gallon of water or 4 teaspoons of bleach per quarter of water to create a bleach solution
- *Outdoor Measures*
- Use knuckles to open the door in public areas.
 - Keep your mobile phones inside your pockets, don't keep it on surfaces.
 - Use your vehicle or home keys to press the buttons of lift.
 - The virus harbours on the surfaces such as glasses, plastics, metals, fabrics for up to 72 hours in ordinary temperature.
 - Avoid visiting air conditioned malls or shops as the virus remains up to 28 days in low temperatures.
- *Responsibility of Homemakers*
- Disinfect the surfaces & objects at home frequently
 - Necessitate the individuals who had been to out for buying essentials to perform hand-washing, bathing, changing of dresses
 - Wash the dresses used at outdoor daily & after washing, immerse it in warm water & dry it sunlight.
 - Restrict visitors to home & avoid visiting to others home.
 - Avoid family gatherings, festivals which involves outside people.
 - Don't allow the family members spend watching the news about COVID- 19 for longer time as it may unnecessarily increase fear & anxiety.
- Rather encourage the family members discussing pleasant things, watch jokes, pleasant music & maintain healthy chat.
 - Don't go for a panic buying & hoarding of essentials.
 - Small kids should be encouraged to cope with the less variety in diet & prepare & serve the diet in an attractive manner.
 - Support the bread winner of the family by being economical in making choice of buying essentials as they face the frustrating moments due to business loss & eventual financial burden.
- *Child Care*
- Teach them effective Hand washing.
 - Do not carry them while going out to buy essentials.
 - Do not feed them any cold items (until covid19-virus scare subsides) as it may create unnecessary confusion.
 - Do not rush to hospital immediately when they show signs of common cold. (Learn to differentiate it from covid virus symptoms)
 - Keep the mobile numbers of doctors nearby for any further telephonic consultation.
 - Engage them in productive activities by preparing for next academic year, developing reading habits, involving in simple house hold activities rather spending more active in mobiles or TV's or electronic gadgets.
 - Teach the kids the importance of avoiding online ordering of diet & encourage them to stick to home-made preparations, considering the situation.
- *Elderly*
- Avoid going out unnecessarily.
 - Postpone routine check-up for some days unless it demands emergency
- *Youths*
- Take up the responsibility of going out to buy essentials provisions rather exposing the elderly at home.
 - Avoid gathering or meeting of friends.
 - Avoid daring the curfew
 - Be a responsible citizen of India by developing sensitivity towards the necessity of curfew imposed us.
 - Avoid spreading unnecessary rumors through social media.
- *Dietary Measures*
- There are no specific dietary measures to COVID 19. But include diet that may increase the overall immunity level of an individual such as
 - Fruits, green leafy vegetables rich in anti-oxidants, vitamin C: lemon, amla, berries, oranges, guava, papaya, avocado, spinach, broccoli, sprouts.
 - Have green tea.
 - Use nuts, cereals, pulses, dry fruits in the diet.
 - Drink plenty of water.
 - Immunity & vitamin D are closely related. Have milk & egg, regular exposure to evening sunlight by keeping the social distancing in mind.

- A misbelief prevails in the society that egg & non vegetarian foods such as chicken, mutton could spread the corona Virus. It's a myth, ensure the non-vegetarian items are boiled & cooked properly.

➤ *Life style measures*

- After going out, take bath.
- Every 20 minutes wash hands & use sanitizers.
- Practice deep breathing
- Practice meditation
- Spend time in prayer
- Practice stretching
- Have a good sleep
- Spend time with family
- Focus on the positive things
- Don't spend more time watching the news about COVID-19.

II. CARING FOR SOMEONE AT HOME

- Have the individual remain in one room, away from others, however much as could reasonably be expected.
- If conceivable, have them utilize a different restroom.
- Abstain from sharing individual family unit things, similar to dishes, towels, and linens.
- Have them wear a fabric face covering (that covers their nose and mouth) when they are around individuals.
- If the sick person is unable to wear fabric face covering, you can wear one when living with them for a similar time.
- If the sick person needs to be around others (within the home, in a vehicle, or doctor's office), they should wear a cloth face covering that covers their mouth and nose.
- Wash your hands frequently with cleanser and water for at least 20 seconds, particularly in the wake of associating with the debilitated individual.
- Do not touch your eyes, your nose, and your mouth.
- Consistently, clean all surfaces that are contacted frequently, similar to counters, tabletops, and doorknobs.
- Use sprays or wipes for the household cleaning according to the package directions.
- Wash clothing completely.
- Wear gloves when the laundry is soiled, and keep the soiled products away from your body when washing. Wash your hands straight away after removing your gloves.
- Do not receive unwanted guests.
- ❖ *Offer care for the symptoms*
- Make sure the patient drinks plenty of water to keep hydrated and rests at bed.
- Over-the-counter drugs can help with the symptoms.
- Symptoms last a few days for most people and get better after a week.

III. MANAGEMENT

- There is as of now no particular drug for COVID-19
- Treatment is supportive care of the patient to help relieve symptoms such as rest, fluids, fever control

IV. PROPHYLAXIS OF SARS-COV-2 INFECTION

The National Taskforce for COVID-19 recommends the use of hydroxyl-chloroquine for prophylaxis of SARS-CoV-2 infection for selected individuals as follows:

A. Eligible individuals

- Asymptomatic health care staff active in the treatment of suspected or confirmed COVID-19 cases
- Asymptomatic healthcare contacts of laboratory confirmed cases

B. Dose

- Asymptomatic health care staff active in the treatment of suspected or confirmed COVID-19 cases: 400mg twice a day on day 1, followed by 400 mg once weekly for next 7 weeks; to be taken with meals.
- Asymptomatic healthcare contacts of laboratory confirmed cases: 400mg twice a day on day 1, followed by 400 mg once weekly for next 3 weeks; to be taken with meals.

V. CONCLUSION

COVID-19 has sent a shiver down the spines of many Indians. We are currently in the stage of community transmission. Every day there is a herculean rise in the number of cases of corona. It is our duty to support our leaders and the health care by following the stringent measures put forth by them i.e. by staying at home and maintaining social distancing so that the burden on the health care can be reduced and soon we will be able to overcome this pandemic in the near future or until a vaccine for the same is invented.

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