



THE ETIOLOGY AND TRANSMISSION, SYMPTOMS, TREATMENT, VACCINE FOR CORONAVIRUS DISEASE (COVID-19)

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ABSTRACT

Coronavirus is one of the major pathogens that primarily targets the human respiratory system that is caused by the Severe Acute Respiratory Syndrome Coronavirus (SARS-COV) is a novel virus that caused the first major pandemic of the new millennium. It is presumed to have started from a wet market in Wuhan city, china large number of infected people that were exposed to wet animal market. The transmission of the Coronavirus disease occurs due to contact with infected person, and it can be also occurred from person to person, through coughing or sneezing, by touching or shaking hands or by contact with contaminated objects or surfaces, infected person. Symptoms like headache, fever, cough, shortness of breath, sputum production, and joints pain. Here we briefly discourse about the introduction of Coronavirus disease, Symptoms, Transmission, Precautions, Treatment.

KEYWORDS: Coronavirus disease, Precautions, Symptoms, Treatment.

INTRODUCTION

Coronavirus is one of the major pathogens that primarily targets the human respiratory system. Coronavirus disease 2019 known as COVID-19. Spr eading rapidly across the globe. the covid-19 virus was first identified in Wuhan, china, in December 2019.

It is the Severe acute respiratory syndrome (SARS) is a novel virus that caused the first major Epidemic of the new millennium.^[1] SARS-COV2 the seventh coronavirus in this family. It The virus protrude from their surfaces. The virus can be infected to animal as well as people both animals and people, and can cause illnesses of the respiratory tract. The virus also transfers from human to human. least four type of coronaviruses cause very mild infections every year. the common cold. Most people get infected with one and more of these viruses at some point in their lives. In china during 2003 another virus spread. that condition called as severe acute respiratory syndrome (SARS). In that period virus prevalence after than had sickened 8,098 people and 774 people were caused death.^[1]

In December 2019, a cluster of patients was admitted to hospital with an initial diagnosis of aetiology. These patients were epidemiologically linked to a seafood and wet animal wholesale market in Wuhan city, China. Early reports predicted the onset of a potential Coronavirus outbreak given the estimate of a reproduction number for the 2019 Novel Coronavirus Disease, named by WHO on 11-Feb-2020.^[4] The Coronavirus disease transmission reported worldwide

leading to a pandemic and affecting roughly 230,392 persons. Coronavirus is enveloped by RNA viruses that are widely distributed among humans, other mammals and birds, which cause respiratory, enteric, liver and neurological diseases. fever, cough, and fatigue, while other symptoms include sputum production, headache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia. The virus leading to respiratory failure, hemodynamic compromise and death. However, some literatures have also reported about involvement of heart, liver, gastrointestinal tract and even central nervous system. patients had underlying diseases, including Diabetes, Hypertension, and Cardiovascular disease.^[1,4,5] These patients were presumed to be infected in that hospital, likely due to nosocomial infection. spread due to many patients getting infected at various locations throughout the hospital through unknown mechanisms. That Coronavirus Disease spread in number of countries that include Taiwan, Thailand, Vietnam, Malaysia, Nepal, Sri Lanka, Cambodia, Japan, Singapore, Republic of Korea, United Arab Emirates, United States, The Philippines, India, Australia, Canada, Finland, France, Germany etc.^[1,3,4,5] transmission of this dangerous virus. The many country research on review the biology of the COVID-19 virus in relation to the epidemiology, pathogenesis, laboratory, clinical presentation, diagnosis, animal models or hosts, and options for treatment, immunization, and infection control.^[1] Researchers are working worldwide on vaccine and testing various pharmaceutical agents which can be major breakthrough in context of Coronavirus Disease treatment in recent future.^[5]

1. Transmission

Currently there is no specific antiviral treatment for Coronavirus Disease. However, similar to treatment of any viral infection, these measures can help.

While you don't need to stay in bed, you should get plenty of rest.

Stay well hydrated.

To reduce fever and pains, take acetaminophen. Be sure to follow directions. If you are taking any combination cold or flu medicine, keep track of all the ingredients and the doses. For acetaminophen, the total daily dose from all products should not exceed 3,000 milligrams.

The Coronavirus Disease can be transmitting from the fluids in respiratory system.

The human to human transmission of Coronavirus Disease spread such as any person infected with the Coronavirus produce respiratory droplets when breathe, talk, cough or sneeze. Etc. when the person breathes, talk, cough or sneeze the virus travel through the air. respiratory droplets fall to the ground within a few feet. Person, who are in close contact with those Infected persons, may catch the virus this way.^[1]

Breathe, talk, Coughing and sneezing without covering the mouth can disperse droplets into the air. Touching or shaking hands with a person who has the virus can pass. or contact with object that has be virus and then touching to the nose, eyes, or mouth.

NIH (National Institutes of Health) suggest that asunder group of people have the highest risk to developing complications due to Coronavirus Disease like Young children, People aged 65-70years or older, Women who are pregnant.^[3] when the person / people should stay at home and rest. when symptoms are active will help to prevent transmission of Coronavirus Disease that people/person should also avoid close contact with other people. Cover the mouth and nose with a tissue, handkerchief or mask, while talking, Coughing and sneezing which can prevent transmission of Coronavirus Disease. (Dispose tissues after use and maintain hygiene around the home).

Researcher don't know how long the corona virus can live on surfaces, and preliminary research suggests that hot and humid environment may not slow down the pathogen's spread. HOT environment inhibits influenza and milder coronaviruses.^[1]

2. Symptoms

The Coronavirus Disease infection emerge after an incubation period of roughly 5.2 days. The period from the onset of Coronavirus Disease symptoms to death ranged from 6 to 41 days. with a median of 14 days. The period is dependent on the patient age and capacity of the patient's immune system. If the patient is 70-75 years old compared with the under the age of 70-75. It shows common symptoms at incursion Coronavirus Disease

symptom like headache, fever, cough, sputum production, haemoptysis, diarrhoea, dyspnoea, and lymphopenia. The acute cardiac injury, acute respiratory syndrome in that opacities led to death. Note the similarities in symptoms meantime virus (COVID-19) and beta corona virus like fever, dry cough and bilateral opacities on chest CT scans is important.^[4]

The Patients has infected with virus (COVID-19) showed highest leukocyte numbers, abnormal respiratory findings, and increased levels of plasma pro-inflammatory cytokines.

- **1st week:** Fever, non-productive cough, Vomiting, nausea, diarrhoea.
- **2nd Week:** Deterioration – Dyspnoea, SOB, Chest tightness.
- **Typical Evolution Period: -**
- **6th day post exposure** – Dyspnoea
- **8th Day** – Admission
- **9th Day-** ICU admission / Intubation Deterioration or recovery most commonly occurs at Day 6-7 of illness.

3. Treatment

3.1 The Coronavirus Disease infection led to the isolation of patients administered a variety of treatments

The treatment of covid-19 virus. first confirmed the person suffering from virus by the laboratory testing. once the person report confirmed that person is positive.

Now a day there are no specific antiviral drugs, vaccine against treatment of Coronavirus Disease infection for potential therapy of humans. just one option available to using broad-spectrum antiviral drugs like HIV-protease inhibitors specific antiviral becomes available.^[4]

The treatment included twice a day oral administration of 75 mg oseltamivir, 500 mg lopinavir, 500 mg ritonavir, and now recently found new drugs such as FABIFLU, CIPREMI, COVIFOR.

IV administration of 0.25 g ganciclovir for 3–14 days.^[4]

Also, ayurvedic medicine CORONIL found by Patanjali is allowed by AYUSH Ministry for Immunity built up.

The AYUSH Ministry of India has suggested homeopathic medicine Arsenicum Album 30 for three days to build up immunity.

Patient in which observed mild Symptoms doctors suggest rest and suggested to drink plenty of fluids. Its help to improve immune system. Most of the people with mild infections those people are recover in almost two weeks.^[1] half of people those have been infected globally have already recovered."

Currently number of drugs are being tested as potential treatment, the antiviral medication is also use for treating Covid 19 patients. It also called remdesivir, which is seen to the effective in animals and it also used to treat the first American patient in Washington State. National Institutes of Health is testing the drug on infected patient. The clinical trial in Nebraska. Gilead company has also started many trails all around Asia.^[1,13]

No anti-viral therapeutics that specifically target human coronaviruses. This treatment only supportive. In vitro, IFNs only partially effective against coronavirus Disease. IFNs in combination with ribavirin it may help increase activity in vitro when compared to IFNs against Coronavirus Disease. The effectiveness of this combination vivo requires further evaluation Coronavirus Disease, The SARS and MERS outbreak are stimulated research on viruses and this research has to recognize a large number of suitable anti-viral targets, targets like, viral proteases, polymerases, and entry proteins. Significant work remains, to develop drugs and that target these processes and are able to inhibit viral replication.^[3]

3.2 Now the most of the doctors are using convalescent plasma treatment; -When people recover from Coronavirus Disease their blood contains antibodies that their bodies produced to fight the coronavirus and help them get well. Antibodies are found in plasma, a component of blood.

In the current situation, antibody-containing plasma from a recovered patient is given by transfusion to a patient who is suffering from Coronavirus Disease. The donor antibodies help the patient fight the illness, possibly shortening the length or reducing the severity of the disease.

And with varying success, not much is known about how effective it is for treating COVID-19. There have been reports of success from China, but no randomized, controlled studies (the gold standard for research studies) have been done. Experts also don't yet know the best time during the course of the illness to give plasma.

On March 24th, the FDA began allowing convalescent plasma to be used in patients with serious or immediately life-threatening Coronaviruse infections. This treatment is still considered experimental.^[4,15]

3.3 Dexamethasone also effective for treating COVID-19

A recent report on a clinical trial showed that the corticosteroid drug dexamethasone decreased the risk of dying in very ill hospitalized Coronaviruse Disease patients. The report was released prior to publication of the study in a medical journal, which means the research results have not gone through the usual careful review.

Many doctors, including those in the United States, have been treating ill Coronaviruse Disease) patients with corticosteroids. It makes biologic sense for those patients who have developed a hyper-immune response (a cytokine storm) to the viral infection. In these cases, it is the immune system's overreaction that is damaging the lungs and other organs, and too often leading to death.

Dexamethasone and other corticosteroids (prednisone, methylprednisolone) are potent anti-inflammatory drugs. They are readily available and inexpensive.

3.4 ibuprofen to treat symptoms of Coronavirus Disease

French doctors advise against using ibuprofen (Motrin, Advil, many generic versions) for COVID-19 symptoms based on reports of otherwise healthy people with confirmed Coronaviruse Disease who were taking an NSAID for symptom relief and developed a severe illness, especially pneumonia. But its just only observations and not based on scientific studies.

The WHO initially recommended using acetaminophen(paracetamol)C8H9NO2 instead of ibuprofen to help reduce fever and aches and pains related to this Coronaviruse Disease infection, but now states that either acetaminophen or ibuprofen can be used. Rapid changes in recommendations create uncertainty. Since some doctors remain concerned about NSAIDs, it still seems prudent to choose acetaminophen(paracetamol)C8H9NO2 first, with a total dose not exceeding 3,000 milligrams per day.^[2,6]

3.5 chloroquine/hydroxychloroquine and azithromycin safe and effective for treating Coronaviruse Disease

Early reports from China and France suggested that patients with severe symptoms of Coronaviruse Disease improved more quickly when given chloroquine or hydroxychloroquine. Some doctors using a combination of hydroxychloroquine and azithromycin with some positive effects.

Hydroxychloroquine and chloroquine the both drug are primarily used to treat malaria and several inflammatory diseases, including lupus. an Azithromycin is a commonly prescribed antibiotic for strep throat and bacterial pneumonia. Both drugs are inexpensive and readily available.

Hydroxychloroquine and chloroquine have ben shown to kill the Coronaviruse Disease in the laboratory dish. The drugs appear to work through two mechanisms. First, they make it harder for the virus to attach itself to the cell, inhibiting the virus from entering the cell and multiplying within it. Second, if the virus does manage to get inside the cell, the drugs kill it before it can multiply. The azithromycin may help to dampen an overactive immune response to the Coronaviruse Disease infection. Chloroquine or hydroxychloroquine with or without

azithromycin should not be used to prevent or treat Coronavirus Disease infection unless it is being prescribed in the hospital or as part of a clinical trial. Clinical trials that were ongoing and about to be started to evaluate the effectiveness of these.^[5]

3.6 The antiviral drug remdesivir effective for treating Coronavirus Disease Scientists all over the world are testing whether drugs previously developed to treat other viral infections might also be effective against the new coronavirus that causes COVID-19. Drugs like remdesivir that successfully hit that target in the viruses that cause SARS and MERS are likely to work against the Coronavirus. Remdesivir inhibited the ability of the coronaviruses that cause SARS and MERS to infect cells in a laboratory dish. The drug also was effective in treating these coronaviruses in animals: there was a reduction in the amount of virus in the body, and also an improvement in lung disease caused by the Coronavirus. The drug appears to be effective in the laboratory dish, in protecting cells against infection by the Coronavirus Disease (as is true of the SARS and MERS coronaviruses), but more studies are underway to confirm that this is true. In early May, the FDA approved emergency use authorization for redeliver in adults and children hospitalized with severe COVID-19 illness.^[8]

3.7 The Does of vitamin D also help to protect against Coronavirus Disease Vitamin D may protect against Coronavirus in two ways. First, it may help boost our bodies' natural defense against viruses and bacteria. Second, it may help prevent an exaggerated inflammatory response, which has been shown to contribute to severe illness in some people with Coronavirus Disease. The recommended dietary dose of vitamin D is 600 IU each day for adults 70 and younger and 800 IU each day for adults over 70. A daily supplement containing 1,000 to 2,000 IU of vitamin D is likely safe for most people. For adults, the risk of harmful effects increases above 4,000 IU per day.

3.8 High-dose vitamin C also used to treat patients of Coronavirus Disease. The high-dose IV vitamin C might help in overwhelming infections. dangerously low blood pressure and organ failure. Another study published last year assessed the effect of high-dose vitamin C infusions among patients with severe infections who had sepsis and acute respiratory distress syndrome (ARDS), in which the lungs fill with fluid. While the study's main measures of improvement did not improve within the first four days of vitamin C therapy, there was a lower death rate at 28 days among treated patients. Though neither of these studies looked at vitamin C use in patients with Coronavirus, the vitamin therapy was specifically given for sepsis and ARDS, and these are the most common conditions leading to intensive care unit admission, ventilator support, or death among those with severe Coronavirus Disease infections. Regarding prevention, there is no evidence

that taking vitamin C will help prevent infection with the coronavirus that causes Coronavirus Disease.

4. VACCIN

In India two type of vaccines are available first "Covishield" (serum Institute of india LTD) and second "Covaxin"(Bharat Biotech International LTD).^[16]

4.1 Covishield

Ingredients of covishield vaccine; L-histidine, L-histidine hydrochloride monohydrate, Magnesium chloride hexahydrate, Polysorbate 80, Ethanol, Sucrose, Sodium chloride, Disodium edetate dehydrate (EDTA), Water for injection. When the vaccine is injected into a patient, it prompts the immune system to start making antibodies and primes it to attack any corona virus infection.^[17]

4.2 Covaxin

Ingredients of covaxin; COVAXINTM contains 6µg of whole-virion inactivated SARS-CoV-2 antigen (Strain: NIV-2020-770), and the other inactive ingredients such as aluminum hydroxide gel (250 µg), TLR 7/8 agonist (imidazoquinolinone) 15 µg, 2-phenoxyethanol 2.5 mg, and phosphate buffer saline up to 0.5 ml.

The vaccine (COVAXINTM) thus has been developed by using inactivated/killed virus along with the aforementioned chemicals. When the vaccine is administered, immune cells can still recognize the dead virus, prompting the immune system to make antibodies against the pandemic virus.^[18]

5. Precautions

5.1 Regularly Wash your hands: clean your hands with an alcohol-based hand wash with soap and water. It helps to kill viruses that may be on your hands.^[1]

5.2 Maintain social distancing: at least 1 meter /3 feet distance Maintain between yourself and anyone. If any person who stand with you and he/she coughing or sneezing they sprayed droplets from their nose or mouth it may contain virus. Then you breathe in the droplets, possibility the Coronavirus Disease if the person coughing has the disease. So social distance help to safe you.^[1]

5.3 Avoid touching your nose, eyes, lips and mouth: Hand touch many surfaces and can pick up viruses. than hands get contaminated. contaminated, hands can transfer the virus to your nose, eyes, lips or mouth. In this way the virus can enter your body. If virus enter in your body it can make you sick.^[1]

5.4 Wear Mask, cover your mouth with clean cloth: It means when you cough or sneeze. covering your mouth and nose with your handkerchief or tissue. Then discard the used tissue immediately. The Droplets spread virus. As a good human Bing you protect the people around

you from viruses such as cold, flu, cough and specially Coronavirus Disease.

5.5 If you have difficulty in breathing, headache and fever, cough: show to a doctor as soon as possible. If you have a headache, fever, cough and problem in breathing, Follow the directions of your doctor and health care authority. Doctors/National/local health care local authorities have the information regarding the situation in your area. Contact your health care service provider to get the right health facility.^[1]

5.6 Increase the immunity power: a strong immune system is one of the biggest advantages for humans and many strengthen their immune system to help fight infections and reduce the risk of highly contagious diseases.

5.7 Avoid to meet those people/persons those recently visited [past 14-15 days] area where virus (COVID-19) is spreading: if the people/persons who interact with those area people/persons and he/she is infected so spreading of Coronavirus Disease chances are more.

5.8 Stay at home: if you are not feeling well, even with mild symptoms as normal headache and normal sneezing stay at home.

5.9 Drink warm water: warm water helps to prevent throat infection. kills virus, it also helps for relieves nasal congestion, clam's central nervous system, drinking warm water increases the body temperature, which improve the metabolic rate. It helps in the breaking the food molecules in your intestine and helps in better digestion as well as adsorption of nutrients.

5.10 Wear PPE KIT (Personal protective equipment kit);- PPE is specialized clothing or equipment for protection against infectious agents. Components of PPE includes gowns, face shields, mask, safety Goggles, nitrile gloves, shoes cover etc. It is very use full for healthcare workers. PPE kit protect form the viral infection.

CONCLUSION

The strength and safety of these candidate drugs mentioned in this article in the treatment of COVID-19 need to be confirmed in controlled trials before the used a licensed drug against Coronaviruse Disease. The drugs is found effective can minimize human to human spread and buy some time for researchers and scientists for success.

An the Future research on coronaviruses will be continue to research many standpoint of viral replications and pathogenesis. belief the propensity of these viruses to lead between species, to establish infection, to identify significant of coronaviruses will be dramatically aid in our ability to predict when and where potential epidemics may be occur.

A bats seem to be significant reservoir for there viruse, will be interesting to determine how they seem to avoid clinically visible disease and its become persistently infected. and it many of the non-structural and accessory proteins encoded by these viruse remain uncharacteriz with a no-known functions, and its important to identify mechanisms of action for the proteins, defining their role in viral replications and pathogenesis.

The studies should be lead to a large number of suitable therapeutic targets to fight against infections. the mechanism of how coronaviruses cause disease and understanding the host immunopathological response.

The manuscript is got conclusion that still we don't have any specific treatment for COVID 19, so we have to take more care like, Wash your hand often with soap and water for 20 seconds, Avoid touching your eyes, nose and mouth with unwashed hands, Stay at home when you are sick and Cover your cough or sneeze with a tissue or cloth.

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