

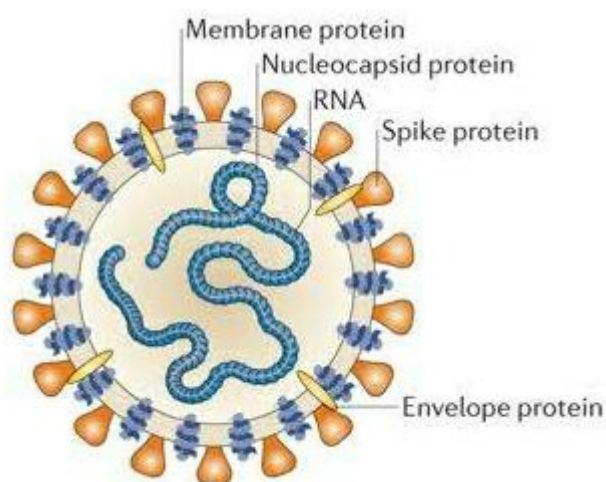
# Covid-19

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## 1. Introduction

Human corona viruses are a large group of viruses known to cause flu and acute respiratory tract infections in patients exposed by inhalation and watery diarrhea in patients exposed by ingestion into GI tract. corona viruses are large, enveloped, positive strand RNA viruses that can be divided into four groups, alpha, beta, Delta and gamma. The alpha and the beta are known to infect human.



Covid-19 is a zoonotic disease known to have been transmitted from animals to humans. Certain viruses like coronaviridae have the property of antigenic shift, with this ability it can jump from one species to another. Predomestic mammals (bats and penguins) can serve as an intermediate host. Human to human spread is by inhalation, ingestion and fomites. SARS-Cov (2002) and MERS-Cov (2012) were the previous similar corona species causing pandemic threats.

## 2. History and Geography

The novel corona virus has arisen from the Wuhan city capital of Hubei province of China. It came from the animal markets of Wuhan where lots of wild animals are sold for consumption. The lack of agricultural produce and cattle rearing in China has led to the legalisation of these animal markets. In ancient Chinese medicine animal parts like rhinoceros horn are prescribed for fever and convulsions. Another popular myth is consumption of penguins scales are to increase immunity.



Assorted dried plant and animal parts used in traditional Chinese medicines, clockwise from top left corner: dried Lingzhi (lit. "spirit mushrooms"), ginseng, Luo Han Guo, turtle shell underbelly (plastron), and dried curled snakes.

The traditional Chinese medicinal practice and fashion to consume wild animals and rare species in rich class have led to breeding and sale of these animals in black markets on a very large scale. These markets are the point of intersection of many species. Viruses like corona have antigenic shift properties to infect more than one species. If these markets are not regulated we might expect similar pandemic in future.

## 3. Political and Administrative Failure

The source of virus was not unknown to Chinese or to the world but still the outgoing flights and other transport was not closed down by the Chinese administration, neither the world countries decided to stop incoming transportation. This led to a pandemic outbreak of covid-19. The countries acted exactly opposite to what they should have done. Many countries sent special airplanes to bring their citizens stranded in China, Iran and Italy and directly have put their entire country's population into danger, one can only imagine how much loss is going to happen now. This would have been easily avoided if all international transportation was closed within Wright time. Most of the world is towards the biggest lockdown now.

Prevention is better than cure:-

- 1) Social distancing:- maintaining a safe distance from each other at least 2-3 metres avoid handshakes and hugs and remaining in isolation till the chain of spread is broken. Especially maintain a distance of at least 4 metres from any old age person above or equal to 65 years, as this disease tends to effect the old population the most.
- 2) Hand washing using soap at least for 20 sec as frequently as possible. Or using hand sanitizers.
- 3) Use of masks if you have cough or sneeze, Always cough and sneeze within handkerchief or napkin, in case of urgency use elbow bend don't use palms.
- 4) Sanitisation personal items and frequent washing and replacement of napkin handkerchief and masks is required. Proper disposal of used masks and napkin should be done.

Volume 9 Issue 3, March 2020

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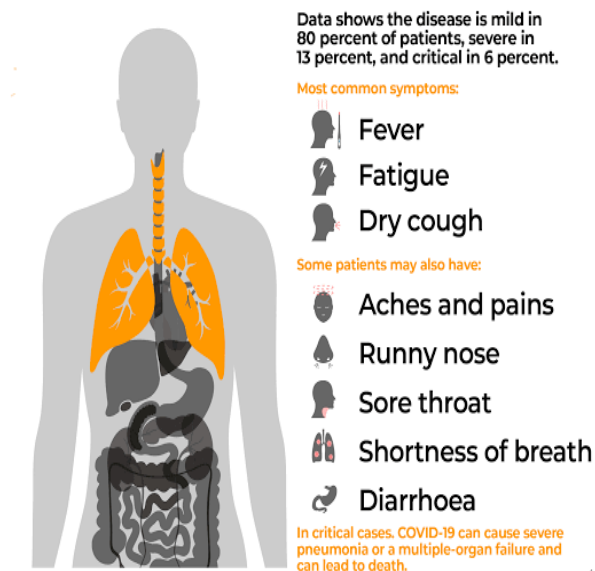
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- 5) Avoid sharing of personal belongings like cell phones, goggles, jewellery, clothes, jackets, pens and watches.
- 6) Use of proper personal protective equipments by health care workers.
- 7) Avoid touching of eyes, nose and lips.
- 8) Avoid travelling in public transport and crowded areas. Remain at home unless emergency.
- 9) Avoid meetings use emails, conference video calls, and conference calls instead.
- 10) Avoid consumption of raw and partially cooked animal products
- 11) Health care workers and laboratory personnel should take special care while handling all kinds of body fluids samples to avoid exposure. And use of triple layer surgical masks, surgical gloves, goggles, screens and gowns by treating doctors. All PPEs must be disposed well to avoid spread.

## CORONAVIRUS PANDEMIC

### COVID-19

COVID-19 is an infectious disease caused by SARS-CoV-2, a new type of coronavirus detected in China in late 2019.



Lack of vaccine and specific drug:--There no vaccine or antiviral drug that can cure covid-19 because of the viruses property of mutation. Hence doctors must rely on symptomatic management of this disease. Symptomatic management involves treatment of symptoms of the disease rather than killing the specific pathogen(virus) for example if the patient infected with corona virus & have fever, cough and breathlessness then doctors prescribes paracetamol for fever, deriphylline for breathlessness and antitussive for cough. This kind of approach is very much effective and life saving for most of the young patients however in old people because of many factors like lack of immunity previous history of respiratory diseases, DM, HTN and patients with low immunity due to cancers and organ transplant medications it's very much challenging for doctors to treat the older patents even after giving the patients life supports like O2 support, mechanical ventilation and dialysis the adult mortality rate is higher through out the world. There are many drugs which can indirectly help in the treatments some of them are very well known vitamins and few very

effective antivirals that have potential for prophylaxis. Few antibiotics, vasopressors, & diuretics can be used in advanced stages.

- 1) Vitamins and natural immunoboosters which strengthen the immunity of old aged people can be used in promote immunity.
  - a) Vitamin A:--vitamin A is known to maintain the respiratory epithelium and plays important role in immunity. Vitamin A is also used in treatment & prophylaxis of measles.
  - b) Vitamin C:-regulates various enzymes which take part in body's defense, it helps in repair of damaged tissues and also a good antioxidant.
  - c) Vitamin E:--Is a antioxidant and protects cell membranes.
  - d) zinc:-it is a mineral which tends to play important role in immunity to fight various lung infection and also used in diarrhea.
  - e) banana lectins and papaya extract:-papaya leaves extract are natural source to many vitamin and mineral for fighting infectious diseases. Bananalectins inhibits viral infections by binding to glycosylated virus envelope. It also has microbicidal properties.

- 2) Antiviral drugs:- which can interfere with the replication of the virus and minimize it's load.
  - a) Ribavirin:- it's interferes with the RNA metabolism required for virus replications.
  - b) Interferons:-interferons inhibit viral replication by interfering with transcription of virus nuclei acid.
  - c) ASCO9F:- hiv protease inhibitor.
  - d) Ritonavir:-Is a Antiretroviral drug which also a protease inhibitor.
  - e) Oseltamivir:-It is neuraminidase inhibitor.
  - f) Lopinavir:--protease inhibitor used along with darunavir and cobicistat.
  - g) darunavir:-nonpeptidic protease inhibitor
  - h) Antimalarial:-Chloroquine and hydroxychloroquine are weak base and immunomodulators combined with remdesivir which is a neucleotide analog was found to be potent.
  - i) Azithromycin with combination of ribavirin and ritonavir or with remdesivir:- No enough evidence of effectiveness is present for this cocktail but few studies show positive results.
  - j) Diuretics and vasopressors might be used in patients with cardiac and renal impairment.
  - k) Diuretics:- spironolactone and torsemide can be used in patients who develop pleural effusion or edema due to cardiac or renal impairment.
  - l) Vasopressors:--Admintration of vasopressors in shock during or after fluid resusitation. Intial blood pressure target is greater than or equal to 65mmhg.
- 3) Symptomatic management/conservative management:- This is the most effective treatment available for covid-19 as there is a lack of particular anti viral drug for treatment. This treatment includes treatment of symptoms and reduce viruses replication rather than killing virus.
  - Use of broad spectrum antibiotics to avoid hospital acquired infections. (Ceftriaxone 1g iv+

azithromycin 500mg oral) or (amoxicillin/clavunate 1.2 g iv + azithromycin 500mg oral)

- Use of glucocorticoids can have immunosuppressive effects hence use in nasal spray (fluticasone) and nebulisation (budesonide) to avoid immune system suppression.
- Life supporting measures in advanced cases:-(O<sub>2</sub> support, mechanical ventilation and dialysis)
- Oxygen support:--O<sub>2</sub> support of 5litre/min in patients with respiratory rate higher than 30/min in adults 60/min in infants and 40/min in 1-5 years. And SpO<sub>2</sub> less than 90% and patients with signs of cyanosis.

**Mechanical ventilation:** In patients who develop bradypnea (respiratory rate less than 12/min), apnea, vital capacity less than 15ml/kg and also patients failing the standard O<sub>2</sub> support and noninvasive ventilation.

**Dialysis:** Blood urea nitrogen (BUN) > 70–100 mg/dl, severe metabolic acidosis, electrolytes imbalance, and patients failing to maintain arterial blood gas.

**Septic shock:** Use vasopressors to maintain mean arterial pressure greater than or equal to 65mmHg and lactate less than or equal to 2mmol/litre. Use ringers lactate/NS (isotonic crystalloids) 30ml/kg for first 3 hours in adults and 20ml/kg in hr for children. Use fluids judiciously to prevent pleural effusion or edema. If central venous catheter is not available then vasopressors can be given by peripheral infusion using large veins. If extravasation occurs stop infusion. If signs of poor perfusion and cardiac dysfunction persist even after achieving MAP target then consider use of inotrope like dobutamin.

#### 4. Diagnostic Tests

- 1) RT-PCR:- Real time reverse transcriptase polymerase chain reaction. However the sensitivity of this test in under scanner because sensitivity is 60% .Hence use of more than one of the following diagnostic test may help.
- 2) CXR:- shows ground glass opacities in 50% cases.

- 3) CT:- This also shows ground glass opacities, in all hospitalised cases, crazy paving, inter/intra lobular septal thickening, air space consolidation, bronchiovascular thickening in leison and traction bronchiectasia. Ground glass opacities and consolidative opacities are usually bilateral, peripheral and basal in distribution.
- 4) Laboratory test like lymphopenia, increased Prothrombin time, and increased lactate dehydrogenase
- 5) Mild elevations of Inflammatory markers (ESR and CRP) were also found.
- 6) Patients with renal impairment shows high BUN and serum creatinine. kidney function, serum electrolytes and arterial blood gas are useful to find out need of dialysis.
- 7) Patients with cardiac injury due to covid-19 shows increased troponin levels.
- 8) Echocardiography:- To exclude cardiac causes of edema..

#### 5. Complications

- a) ARDS:- Acute respiratory distress syndrome.
- b) Acute cardiac injury:- elevated troponin levels, myocardial ischemia, cardiac arrest, secondary infections.
- c) Sepsis
- d) Multiorgan failure- Lungs, kidneys and heart failure are most common.
- e) In few ICU case there were secondary hemophagocytic lympho histiocytosis.

Based on duration of Symptoms the disease can be varied as based on CT findings:-

- 1) Early initial stages (day 1-4) :- normal CT is upto 50% cases ground glass opacities in posterior and peripheral parts of lungs predominantly in lower lobes can be seen.
- 2) Progressive stage:- 5-8 days - increased ground glass opacities with increased reticular pattern leading to crazy paving.
- 3) Peak stage :- 10-13 days this is the stage of consolidation.
- 4) Absorption:- >13 gradual resolution.

# Cover Cough

— Stop the spread of germs that can make you and others sick! —

