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Review Article

Novel Coronavirus: A Newly Arranged Review

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Abstract

Coronavirus infect many of animals, including humans beings and rarely can be transmitted from animals to humans and then from one person to large population. The Official name of the Coronavirus is COVID-19. This coronavirus infection have great concern in global. It is first time reported in the China (Wuhan), in end of December 2019 From China it has spread too many other countries around the world at very faster rate. Now India is also one of Organization) declared Novel Coronavirus a "Pandemic". From China it is spreader from seafood and meat. Major symptoms of this infection is respiratory illness. The people which can get easily infected by Coronavirus are Old people (age above 60 years), children (age below 10 Years), Pregnant women and the people who are suffering from diseases like diabetes, cancer, cardiovascular diseases and any chronic respiratory diseases. This virus directly acts on the Immune system of the person. This disease is transmitted by inhalation or contact with droplets and the incubation period ranges from 2 to 14 days. When healthy one come in contact with saliva droplets or nose discharge of the infected shaking and wash every edible things before having it, use alcohol sanitizer to wash your hands. Till now there is no specific vaccines for this infection but by above precautions it can be controlled. In this review we will conclude detailed information of the coronavirus infection.

Keywords: China; COVID-19; Immune System; Precaution; Virus

Introduction and Background

Coronavirus is spherical or pleomorphic enveloped particles containing single stranded [positive sense] RNA associated with a nucleoprotein with a capsid comprised of matric protein. The envelope bears club-shaped glycoprotein projections. It belongs to the Phylum: Incertae sedis, Order: Nidovirales, Family: Coronaviridae and Subfamily: Orthocoronavirinae. Their viral RNA genome ranges from 26 to 32 kilobases in length. It is highly diffusible virus spread by droplets, direct contact and contact with infected objects. It is emerged in Wuhan, China at the end of 2019. On January 24th 2020, at least 830 cases had been diagnosed in nine countries: China, Thailand, Japan, South Korea, Singapore, Nepal, Vietnam and Taiwan [1,2].

Coronavirus make up a large family of viruses that can infect birds and mammals, including human beings, according to W.H.O (World Health Organization). This virus is responsible for causing severe acute respiratory syndrome (SARS) [3].

In 2003, the Chinese population was infected with a virus causing severe acute respiratory syndrome (SARS) in Guangdong, China. This virus was confirmed as a member of the Beta coronavirus subgroup and was named as SARS-COV [4]. A decade later in 2012 a couple of Saudi Arabian nationals were diagnosed to be infected with another Novel coronavirus. The detected coronavirus was confirmed as a member of coronavirus and named as the Middle East respiratory syndrome coronavirus (MERS-COV) [5].

Classification of corona-viruses [6]

Phylum	Incertae sedis
Order	Nidovirales
Family	Coronaviridae
Subfamily	Orthocoronavirinae
Genus	Coronavirus
Species	Human coronavirus 229E Human coronavirus OC43 Human coronavirus NL63 Human coronavirus HKU1 Human enteric coronavirus

Table 1: Classification of corona virus.

Structure of coronavirus

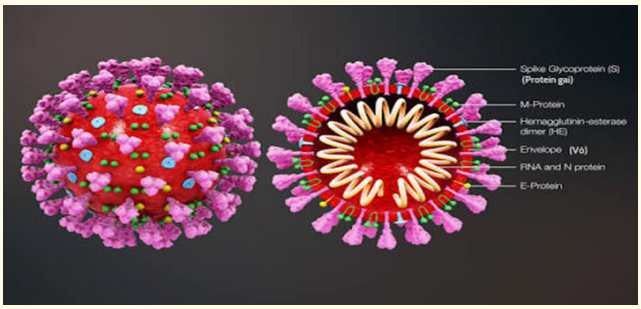

Figure 1: Structure of novel corona virus [6].

Types

Coronavirus belong to the subfamily Coronavirinae in the family Coronaviridae. Different types of human coronavirus are:

Common types

- 229E (alpha coronavirus)
- NL63 (alpha coronavirus)
- OC43 (beta coronavirus)
- HKU1 (beta coronavirus) [6].

Diagnosis

The U.S CDC has developed criteria for person under investigation (PUI). If a person is deemed a PUI, immediate prevention and infection and control measures are undertaken. Epidemiological factors are used to assess the requirement of testing. These include close contact with a laboratory-confirmed patient with 14 days of symptoms or travel history to an infected area within 14 days of symptoms onset [7].

The chest X-ray (CXR) usually shows bilaterally infiltrates but may be normal in early disease. The CT is more sensitive and specific. CT imaging generally shows infiltrates, ground opacities and sub segmental consolidation. It is also abnormal in asymptomatic patients with no clinical evidence of lower respiratory tract involvement. In fact, abnormal CT scans have been used to diagnose COVID-19 in suspect cases with negative molecular diagnosis; many of these patients had positive molecular tests on repeat testing [8].

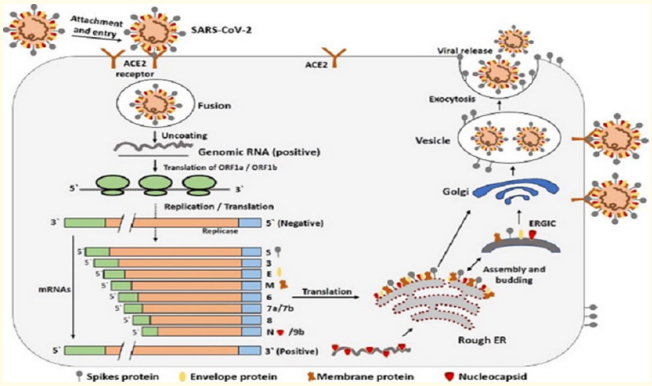

Figure 2: Replication cycle of coronavirus [9].

Transmission

Through Respiratory infected droplets can be transmitted of different sizes of droplet, when the droplet particles size are > 5 - 10 µm in diameter, they are referred to another person through by respiratory droplets and when the droplets particles are < 5 µm in diameter, they are referred as droplets nuclei. According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes. Droplet transmission occurs when a person is in close contact (within 1m) with someone who has respiratory symptoms (coughing and sneezing) and is therefore at risk of having his/her mucosa (mouth/nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets. Transmission may also

occur through fomites in the immediate environment around the infected person [10]. Some animal coronaviruses, such as feline coronavirus (F Co-V), may spread through contact with faces. However, it is unclear whether this also applies to human coronaviruses. The National Institute of Health (NIH) suggests that several groups of people have the highest risk of developing complications due to COVID-19.

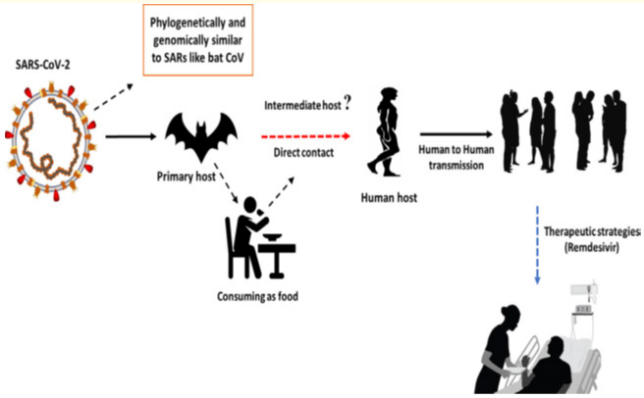

Figure 3: Mode of transmission [9].

These groups include:

- Young children
- People aged 65 years or older
- Women who are pregnant.

Coronaviruses will infect most people at some time during their lifetimes. Coronaviruses can mutate effectively, which make them so contagious [11].

Symptoms

- Fever
- Breathlessness
- Cough
- It may take 2 - 14 days for a person to notice symptoms after infection.
- Sneezing
- Running nose
- Sore throat
- Watery diarrhea
- Exacerbated asthma [12].

Management and vaccination

There is no special vaccine for this yet. Only supportive therapy is the treatment strategy followed by health professionals. Supportive therapy includes administration of antipyretic and analgesic, maintenance of hydration, mechanical ventilation as respiratory support and uses of antibiotic in bacterial infections. Some research studies claimed that ribavirin and interferon-alpha have offered synergetic effect in early stage. While other studies reported mycophenlic acid as momotherapy. Still health professionals were not fully satisfied with any therapy so further clinical research needed [13-17].

Prevention

People can take several steps:

- Resting and avoiding overexertion.
- Drinking enough water.
- Avoiding smoking and smoky areas.
- Taking acetaminophen, ibuprofen or naproxen for pain and fever.
- Using a clean humidifier or cool mist vaporizer.
- A doctor can diagnose the virus responsible by taking a sample of respiratory fluids, such as mucus from the nose or blood.

Standard recommendations to prevent the spread

It is include regular hand washing, covering mouth and nose when someone coughing and sneezing thoroughly cooking meat and eggs. Avoid close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing [18-20].

Domestic animal which get infected by coronavirus

- Infectious bronchitis virus(IBV) causes avian infectious bronchitis.
- Bovine coronavirus (BCV), responsible for severe profuse enteritis in of young calves.
- Porcine coronavirus (transmissible gastroenteritis coronavirus of pigs, TGEV).
- Feline coronavirus (F Co-V) Causes mild enteritis in cats as well as severe Feline infectious peritonitis
- Turkey coronavirus (TCV) causes enteritis in turkeys.

- Rabbit enteric coronavirus causes acute gastrointestinal diseases and diarrhea in young European rabbits [20-24].

Conclusion

COVID-19 is a contagious respiratory disease triggered by a newly virus SARS-COV-2. People who have underlying medical conditions like Diabetes, cancer etc. who suffer with immunity problem and those person who have above age 60 years old have a higher risk of developing severe disease and death due to Covid-19. Common symptoms are fever, shortness of breath, tiredness, dry cough. People with mild symptoms should self-isolate and inform the doctors for treatment and recommendation. It is necessary to develop potential therapeutic strategies to prevent further epidemics and cure infected people. At present superlative prophylaxis accepted globally is social distancing and 'stay home, stay safe' apart from taking other suggested safeguards:

- COVID 19 is a new disease caused by the new Coronavirus, SARS-CoC-2.
- Primarily, it is zoonotic disease-wild animals (bats, pangolin, camel, cattle etc.).
- COVID 19 is transmitted from bats and fomites.
- Elderly and having co-morbidities are having high risk.
- Common symptoms including fever, dry cough and breathing difficulty.
- RT-PCR IS THE confirmatory diagnostic test.

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