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A review on novel Corona virus

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ABSTRACT

Coronavirus are comes under a broad family of virus that can cause respiratory illnesses such as the common cold, according to the Centers for Disease Control and Prevention (CDC). They are usual in many different species of animals, including camels and bats. Unusually, these corona viruses can evolve and infect humans and then spread between humans. Recent examples of this include SARS-CoV and MERS-CoV. 2019 Novel Corona virus (2019-nCoV) is a virus identified as the cause of an outbreak of respiratory illness first detected in Wuhan, China. This virus causes respiratory infections in humans, which are hourly mild but are potentially lethal. In some cases, the viruses can cause lower-respiratory tract illnesses such as pneumonia and bronchitis. In human corona viruses are currently classified into seven types that are HCoV-229E, HCoV-OC43, HCoV-NL63, SARS-CoV, HKU1, MERS-CoV and 2019-nCoV. These two types of corona virus (MERS-CoV and SARS-CoV) are more dangerous. The Novel corona virus (2019-nCoV) is newly discovered, or newly originated, and is a placeholder name and also known as Wuhan pneumonia or Wuhan corona virus. Some of corona viruses like HCoV-229E, HCo-OC43, HCo-NL63 and HKU1 that are continuously circulate in the population of human and cause respiratory infections in human either may children and adults world-wide. They are generally transmitted between animals and humans through sneezing, coughing, touching or shaking hands and making contact with a surface or object. The symptoms of corona virus are sneezing, cough, fatigue, runny nose, sore throat, breathing difficulty and exacerbated. In more severe cases SARS, kidney failure, pneumonia and even death. Diagnosis can be carried out by healthcare provider in laboratory test on respiratory specimens and serum to detect human corona virus. To prevention of corona virus by covering mouth and nose when sneezing and coughing, avoid unprotected contact with live animals and also washing hand with soap and water. For this virus no specific treatment like vaccines and antiviral drugs but symptoms can be treated.

Keywords: Corona viruses, Virus, 2019-nCoV, MERS-CoV, SARS-CoV, Respiratory symptoms.

INTRODUCTION

The name "coronavirus" is derived from the Latin corona and the Greek "κορώνη" (korone, "garland, wrealth"), meaning crown or halo. Corona virus are comes under a broad group of viruses that belonging to the nidovirales order, which includes coronaviridae, arteriviridae and roniviridae families. In the four groups of coronaviridae are further subdivided like alpha, beta, gamma and delta corona viruses. In humans, the virus causes respiratory infections, often mild, but in rare cases potentially lethal. There are no vaccines or antiviral drugs that are approved for prevention or treatment. Corona viruses are enveloped viruses with a positive-sense single-stranded RNA genome and with a nucleocapsid of helical symmetry. The genomic size of corona viruses ranges from approximately 26 to 32 kilobases, the largest for an RNA virus. [1-4]

HISTORY

Coronaviruses were first identify in the 1960s; in mint condition discovered were infectious bronchitis virus in chickens and human corona virus 229E and human corona virus OC43 this two viruses are form the nasal cavities of human patients with the common cold. SARS-CoV IN 2003, HCoV- NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012 that are comes under members of this family have since been identified. On 31 December 2019, the WHO China Country Office was informed of cases of pneumonia of unknown etiology (unknown cause) detected in Wuhan City, Hubei Province of China. A novel corona virus (2019-nCoV) was identified as the causative virus by Chinese authorities on 7 January. Greater portion of these have been involved in serious respiratory tract infections. [5-8]

What are corona viruses?

Corona virus is a family of viruses that commonly affect the respiratory tract of mammals, along humans. They are associated with the common cold, pneumonia, and severe acute respiratory syndrome (SARS) and can also affect the gut.

Corona viruses were given their name based on the crown-like projections on their surfaces. "Corona" in Latin means "halo" or "crown." Among humans, infection most often occurs during the winter months as well as early spring. These viruses are responsible for between 15 and 30 percent of common colds. Over the last 70 years, scientists have found that corona viruses can infect mice, rats, dogs, cats, turkeys, horses, pigs, and cattle. [9, 10]

Types

The human corona viruses are currently six recognized types that can infect humans.
They are;

1. 229E (alpha coronavirus)
2. NL63 (alpha coronavirus)
3. OC43 (beta coronavirus)
4. HKU1 (beta coronavirus)
5. MERS-CoV (Middle East Respiratory Syndrome-Coronavirus)
6. SARS-CoV (Severe Acute Respiratory Syndrome-Coronavirus)

MERS and SARS this two are more dangerous types

Mers

MERS-CoV, which causes Middle East Respiratory Syndrome (MERS), was first recognized in 2012. This severe respiratory illness first surfaced in Saudi Arabia and, since then, has spread to other countries.

Symptoms include fever, breathlessness, and coughing. The illness spreads through close contact with people who have already been infected. However, all cases of MERS are linked to individuals who have recently returned from travel to the Arabian Peninsula. [11]

MERS is fatal in 30 to 40 percent of people who contract it.

Sars

SARS-CoV, which causes Severe Acute Respiratory Syndrome (SARS), it typically led to a life-threatening form of pneumonia. SARS-CoV is unique. It can infect both the upper and lower respiratory tract and can also cause gastroenteritis. [12]

The symptoms of SARS develop over the course of a week and start with a fever. Early on in

the condition, people develop flu-like symptoms, such as:

- dry coughing
- chills
- Diarrhea
- Breathlessness
- aches

Pneumonia, a severe lung infection, may develop afterward. At its most advanced stage, SARS causes failure of the lungs, heart, or liver.

During the epidemic, there were 8,098 confirmed cases of SARS with 774 fatalities. This is equal to a mortality rate of 9.6 percent.

HUMAN CORONAVIRUSES

There are seven known strains of human corona viruses;

1. Human coronavirus OC43 (HCoV-OC43)
2. Human coronavirus 229E (HCoV-229E)
3. Human coronavirus HKU1
4. SARS-CoV
5. Human coronavirus NL63 (HcoV-NL63, New Haven coronavirus)
6. Middle East respiratory syndrome coronavirus (MERS-CoV), previously known as novel coronavirus 2012 and HCoV-EMC.
7. Novel coronavirus (2019-nCoV), also known as Wuhan pneumonia or Wuhan coronavirus, (Novel in this case means newly discovered, or newly originated, and is a placeholder name.) [13-18]

TRANSMISSION

Coronaviruses are zoonotic, meaning they are transmitted between animals and people. They are circulating in animals and some of these coronaviruses have the capability of transmitting between animals and humans. It is most likely transmitted through coughing and sneezing, as is the case with influenza and other respiratory viruses, said Dr. Vaishampayan.

Coronaviruses can spread in the following ways: Coughing and sneezing without covering the mouth can disperse droplets into the air, spreading the virus. Touching or shaking hands with a person that has the virus can pass the virus from one person to another. Making contact with a surface or object that has the virus and then touching your nose, eyes or mouth. Researchers found that 22 percent had direct exposure to the meat market, and 32 percent had contact with people who had a fever or respiratory disease.

SYMPTOMS

Basic signs of Corona virus are refers of infection include respiratory symptoms, cough, fever, breathing difficulties and shortness of breath. In more acute cases, kidney failure, severe acute respiratory syndrome, infection can causes pneumonia and even death.

In generally cold like symptoms set in form two to four days after corona virus infection. The symptoms of corona virus typically contain: sneezing, a cough, fatigue, fever, a runny nose and a sore throat, exacerbated asthma.

DIAGNOSIS

Healthcare provider may order laboratory tests on respiratory specimens and serum (part of your blood) to detect human corona viruses. Laboratory testing is more likely to be used if you have severe disease or are suspected of having MERS.

If you are experiencing symptoms, you should tell your healthcare provider about any recent travel or contact with animals. Most MERS-CoV infections have been reported from countries in the Arabian Peninsula. Therefore, reporting a travel history or contact with camels or camel products is very important when trying to diagnose MERS.

PREVENTION

For the corona virus to prevent covering mouth and nose when coughing and sneezing, infection spread includes regular hand washing and also symptoms of respiratory illness. The World Health Organization has advised people to avoid "unprotected" contact with live animals, thoroughly cook meat and eggs, and avoid close contact with anyone with cold or flu-like symptoms.

Standard recommend a basic hand hygiene, such as washing your hands with soap and water and respiratory hygiene, such as when you sneeze, sneezing into your elbow. Ways to protect yourself

against a potential animal source would be to avoid unnecessary unprotected contact with live animals and to make sure that you wash your hands thoroughly after connecting with animal.

TREATMENT

There are no vaccines or antiviral drugs that are approved for prevention or treatment and no specific treatments for corona viruses, but symptoms can be treated. The main treatment is supportive care, including making sure the patient is getting enough oxygen, and using a ventilator to push air into the lungs if necessary, Dr. Vaishampayan said.

Patients should rest and drink plenty of fluids "while the immune system does its jobs and heals itself," she said. No drugs have been approved for any corona virus diseases; though an antiviral medication called remdesivir appears to be effective in animals.

NOVEL CORONAVIRUS (2019-NCOV)

On 31 December 2019, WHO was informed of a cluster of cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China? In addition to providing care to patients and isolating new cases as they are identified, Chinese public health officials have reported that they remain focused on continued contact tracing, conducting environmental assessments at the wholesale market, and investigations to identify the pathogen causing the outbreak.

WHO is closely monitoring this event and is in active communication with counterparts in China. In line with standard protocols for any public health event, an incident management system has been activated across the three levels of WHO (country office, regional office and headquarters) and the Organization is prepared to mount a broader response, if needed.

What to Do About Coronavirus

There is no vaccine for corona virus. To help prevent a corona virus infection, do the same things you do to avoid the common cold:

- Wash your hands thoroughly with soap and warm water or with an alcohol-based hand sanitizer.
- Keep your hands and fingers away from your eyes, nose, and mouth.
- Avoid close contact with people who are infected.

You treat a corona virus infection the same way you treat a cold

- Get plenty of rest.
- Drink fluids.
- Take over-the-counter medicine for a sore throat and fever. But don't give aspirin to children or teens younger than 19; use ibuprofen or acetaminophen instead. A humidifier or steamy shower can also help ease a sore and scratchy throat. Even when a corona virus causes MERS or SARS in other countries, the kind of corona virus infection common in the U.S. isn't a serious threat for an otherwise healthy adult. If you get sick, treat your symptoms and contact a doctor if they get worse or don't go away.

How many people have the new virus?

As of Jan. 23, there are more than 500 confirmed cases and 17 deaths linked to the 2019-nCoV virus in China, according to the BBC. The World Health Organization (WHO) said on Jan. 20 that 51 of the patients are "severely ill," and 12 are in "critical condition."

How far has the virus spread?

The first cases of the pneumonia-like virus were reported in Wuhan, China on Dec. 31, 2019. Washington State was confirmed to have the virus after returning to the U.S. from Wuhan on Jan. 15, becoming the first case in the U.S., officials announced on Jan. 21).

Where did the virus come from?

Since the virus first popped up in Wuhan in people who had visited local seafood and animal market, officials could only say it likely hopped from an animal to humans. In a new study, however, researchers sequenced the genes of 2019-nCoV (as the virus is now called), and then they compared it with the genetic sequences of more than 200 corona viruses that infect various animals around the world. Their results, detailed in the

Journal of Medical Virology, suggested that 2019-nCoV likely originated in snakes.

As for what kind of snake, the scientists noted there are two snakes that are common to southeastern China where the outbreak originated: the many-banded krait (Bungarusmulticinctus) and the Chinese cobra (Najaatra).

How did the virus hop from a snake to humans?

A woman walks in front of a closed seafood market in Wuhan, China. Officials believe the market is linked with an outbreak of pneumonia caused by a new virus. Some viruses are known to become capable of transmitting to humans, and this corona virus is one of those. But how? The study published in the Journal of Medical Virology, revealing the likely snake host, also found that a change to one of the viral proteins in 2019-nCoV allows the virus to recognize and bind to receptors on certain host cells. This ability is a critical step to entering cells, and the researchers said that the change in this particular protein may have helped the virus hop from snakes to humans. [19-26]

Can the virus spread between people?

Yes, in limited cases, according to the CDC, but the primary mode of transmission seems to be from animal to human. In terms of how one would catch the virus, the CDC says that human corona viruses are most commonly spread between an infected person and others via:

- The air (from viral particles from a cough or sneeze)
- Close personal contact (touching or shaking hands)
- An object or surface with viral particles on it (then touching your mouth, nose or eyes before washing your hands)
- And rarely from fecal contamination

How would this virus cause a pandemic?

In order for this virus, or any, to lead to a pandemic in humans, it needs to do three things: efficiently infect humans, replicate in humans and then spread easily among humans, live Science previously reported. Right now, the CDC is saying this virus passes between humans in a limited manner, but they are still investigating.

How does the virus compare to SARS and MERS?

MERS and SARS have both been known to cause severe symptoms in people. It's unclear how the new corona virus will compare in severity, as it has caused severe symptoms and death in some patients while causing only mild illness in others, according to the CDC. All three of the corona viruses can be transmitted between humans through close contact.

MERS, which was transmitted from touching infected camels or consuming their meat or milk, was first reported in 2012 in Saudi Arabia and has mostly been contained in the Arabian Peninsula, according to NPR. SARS was first reported in 2002 in southern China (no new cases have been reported since 2004) and is thought to have spread from bats that infected civets. The new corona virus was transmitted from touching or eating an infected animal in Wuhan.

What are the symptoms of the new corona virus and how do you treat it?

Symptoms of the new corona virus include fever, cough and difficulty breathing. There are no specific treatments for corona virus infections and most people will recover on their own, according to the CDC. So treatment involves rest and medication to relieve symptoms. A humidifier or hot shower can help to relieve a sore throat and cough. If you are mildly sick, you should drink a lot of fluids and rest but if you are worried about your symptoms, you should see a healthcare provider, they wrote. (This is advice for all corona viruses, not specifically aimed toward the new virus).

There is no vaccine for the new corona virus but researchers at the U.S. National Institutes of Health confirmed they were in preliminary stages of developing one. In addition, the drug company Regeneron announced that it is in the early stages of developing a treatment for this virus, according to NBC News.

What is being done to stop the spread of the corona virus?

Health officers screen arriving passengers from China with thermal scanners at Changing International airport in Singapore on Jan. 22, 2020,

as authorities increased measures against the spread of the newfound corona virus.

Chinese authorities have begun to quarantine the city of Wuhan, cutting off public transportation to and from the city including the metro system, airport, train and bus stations. Officials have also begun to cut off access to highways leading into the city.

Major airports in the U.S. have begun screenings to make sure incoming passengers aren't infected. In addition, the CDC now recommends avoiding nonessential travel to Wuhan.

What do we expect in the coming days?

Looking at what happened with MERS and SARS, it's likely that some spread of the virus from close contact between humans will continue to occur, according to CDC. More cases — possibly including some in the U.S. — will likely be identified in the coming days.

How can people protect themselves and others?

If traveling to Wuhan, you should avoid contact with sick people; avoid dead or alive animals, animal markets or products that come from animals such as uncooked meat, according to the CDC. You should often wash hands with soap and water for at least 20 seconds, they wrote. If you are infected by the virus you can take steps to help avoid transmitting it to others such as isolating yourself at home, separating yourself from other people in the house, wearing a face mask, covering your coughs and sneezes and washing your hands, according to the CDC.

CONCLUSION

The most recent common ancestor of the corona virus has been placed at 8000 BCE. They may be considerably older than this. Another estimate places the most recent common ancestor (MRCA) of all corona viruses around 8100 BCE. The MRCA of Alpha corona virus, Beta corona virus, Gamma corona virus, and Delta corona virus have been placed at about 2400 BCE, 3300 BCE, 2800 BCE and 3000 BCE, respectively. It appears that bats and birds, the warm-blooded flying vertebrates, are ideal hosts for the corona virus gene source (with bats for Alpha coronavirus and Beta coronavirus, and birds for Gamma corona virus and Delta corona virus) to fuel corona virus evolution and dissemination. Bovine corona virus and canine respiratory corona virus diverged from a common ancestor in 1951. Bovine corona virus and human corona virus OC43 diverged in 1899. Bovine corona virus diverged from the equine corona virus species at the end of the 18th century. Another estimate suggests that human corona virus OC43 diverged from bovine corona virus in 1890. The MRCA of human corona virus OC43 has been dated to the 1950s. Middle East respiratory syndrome corona virus, although related to several bat species, appears to have diverged from these several centuries ago. The most closely related bat corona virus and the SARS corona virus diverged in 1986. A path of evolution of the SARS virus and keen relationship with bats has been proposed. The authors suggest that the corona viruses have been coevolved with bats for a long time and the ancestors of SARS virus first infected the species of the genus Hipposideridae, subsequently spread to species of the Rhinolophidae and then to civets, and finally to humans. Alpaca corona virus and human corona virus 229E diverged before 1960. The human corona virus NL63 and a bat Coronavirus shared an MRCA 563–822 years ago [27].

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