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Coronavirus is a family of viruses that cause respiratory infections. It receives this name because the characteristics (the image) of the virus resemble a crown (corona, in Spanish). This infectious agent was first identified in humans and isolated in 1937. However, it was only described as a Coronavirus in 1965, when profile analysis under microscopy revealed this appearance⁽¹⁾.

Aiming accompany the new virus discovered on December 31, 2019, and which has attracted the attention of health authorities worldwide, it was technically named COVID-19. Because it also looks like a crown, it has been called the new Coronavirus. The first cases of this agent were recorded in Wuhan, China⁽¹⁾.

Therefore, although health authorities are on the alert, most people are infected with common Coronaviruses throughout their lives, with young children being more likely to become infected with these variants. The most regular types that infect humans are the alpha Coronavirus 229E and NL63 and the beta Coronavirus OC43, HKU1⁽¹⁾.

It is worth remembering that Coronaviruses are positive strand RNA viruses involved, which replicate in the cytoplasm. To deliver their nucleocapsid to the host cell, they depend on the fusion of their envelope with the membrane of the host cell. The spike (S) glycoprotein mediates the entry of the virus and is a primary determinant of

cell tropism and pathogenesis⁽²⁾.

Therefore, it is classified as a class I fusion protein and is responsible for binding to the receptor in the host cell, in addition to mediating the fusion of the host and viral membranes - a process that is driven by the main conformational changes of the S protein⁽²⁾.

In this context, Coronaviruses gained notoriety when the severe outbreak of acute respiratory syndrome (SARS) shook the world in 2002-2003. Interest in this family of viruses grew after the epidemic, leading to the identification of many new members of the family. This episode also shed light on Coronaviruses' ability to jump barriers across species. Before gaining importance for public health in 2003, diseases associated with Coronavirus were mainly of veterinary interest⁽³⁾.

Continuing, Coronaviruses infect a wide variety of mammals and birds, causing respiratory and enteric diseases and, in some rarer cases, hepatitis and neurological disease. The infection can be acute or persistent. Coronaviruses are classified into four different genera, historically based on serological analysis and now on genetic studies: alpha, beta, gamma and delta-CoV⁽⁴⁾ and, in addition to this classification, the Coronaviruses belong to the Subfamily Coronaviridae which, together with Torovirinae, forms the Coronaviridae family in the Order Nidovirales⁽²⁾.

In view of this statement, viral entry depends on a good interaction between

the virion and the host cell. The infection is initiated by the interaction of the viral particle with specific proteins on the cell surface. Coronaviruses use a variety of receptors and triggers to activate fusion, however, key aspects that allow this early stage of the viral life cycle are conserved⁽²⁾.

Therefore, as mentioned above, the Coronavirus peak protein/receptor pairing is a key determinant of tropism. To infect a new host species, Coronaviruses must adapt to their new host's receptor by mutation or by recombination with a Coronavirus infecting their new host. In the case of SARS-CoV, the virus appeared in 2002 in the retail markets for live animals in China⁽⁵⁾.

Some authors⁽⁵⁾ claim that related viruses were isolated from civets (*Paradoxurus hermaphroditus*) of Himalayan palms, also called musang or Asian palm civet, raccoon dogs and Chinese ferrets; however, it is believed that these animals were not the reservoir of the virus, but intermediate hosts during the species' jump event. The SARS-CoV receptor is the angiotensin 2-converting enzyme (peptide from the renin-angiotensin-aldosterone system - SARS). This peptide plays an important role in regulating blood pressure (ACE2).

THE CORONAVIRUS ENTERING A VULNERABLE CELL

Authors⁽⁶⁾ explain the entry of the

virus into the cell, and as everyone knows, the virus enters the body through the nose, mouth or eyes and then binds to the cells in the airways that produce a protein called ACE2. The virus is believed to have originated in bats, where it may have linked to a similar protein.

However, in the cell there is release of RNA, genetic material, after fusing its membrane with that of the human cell. The infected cell reads the RNA and begins to produce proteins that will keep the immune system in check helping to create new copies of the virus, and as the infection progresses, the cell's mechanism begins to produce new spikes and other proteins that will make more copies. of Coronavirus, spreading the infection⁽⁶⁾.

Continuing, each infected cell can release millions of copies of the virus before the cell finally breaks down and dies. Viruses can infect nearby cells or end up in droplets that escape from the lungs.

IMMUNE RESPONSE

Most Covid-19 infections cause fever, because the immune system struggles to eliminate the virus. In severe cases, this immune reaction can attack lung cells. The lungs are blocked with fluid and dying cells, making breathing difficult. A small percentage of infections can lead to acute respiratory distress syndrome and possibly death⁽⁶⁾.

In view of this statement, the director of the Medical Center for Infectious Diseases, Owen Tsang Tak-Yin, patients cured of the disease tire very easily and, some of them, may have a 20 to 30% drop in lung function⁽⁷⁾.

Antibiotics kill bacteria and do not work against viruses. But researchers are testing antiviral drugs that can disrupt viral proteins and stop infection.

COVID-19

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an infectious disease caused by a newly discovered Coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and will recover without the need for special treatment. Elderly people and those with underlying medical conditions, such as cardiovascular disease, diabetes, chronic respiratory diseases and cancer, are more likely to develop serious illnesses⁽⁸⁾.

Thinking that way, the best way to prevent and slow transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infections by washing your hands or using an alcohol-based mop on floors frequently, and always avoid without touching your face⁽⁸⁾.

It is worth emphasizing that the COVID-19 virus spreads mainly through droplets of saliva or nasal discharge when an infected person coughs or sneezes; therefore, it is important to practice breathing etiquette - for example, coughing on a flexed elbow⁽⁸⁾.

In this context, since now there are no specific vaccines or treatments for COVID-19, greater care is needed with everything and everyone. However, there are many clinical trials underway evaluating possible treatments. The World Health Organization (WHO) will continue to provide updated information as soon as clinical findings are available⁽⁸⁾.

In all other contexts, the available evidence indicates that the COVID-19 virus is transmitted during close contact through respiratory droplets, such as coughing, or sneezing and by fomites (contaminated objects). The virus can spread directly from person to person when an infected person coughs or exhales producing droplets that reach another person's nose, mouth or eyes⁽⁹⁾.

Another significant highlight is the droplets that are too heavy to be transported by air, so they land on objects and surfaces around a person, just touching the objects or surfaces, bringing

your hands to your nose, mouth or eyes, others people will be infected. Important the distance from one person to another one meter or more, limiting this spread⁽⁹⁾.

It is worth pointing out that health professionals, because they are very close to the patient due to clinical care, the generation of aerosols directly affects this professional. As such, WHO continues to recommend that everyone perform hand hygiene frequently, following the label recommendations and regularly clean and disinfect surfaces. Paying attention to the importance of maintaining physical distances and avoiding people with fever or respiratory symptoms⁽⁹⁾.

Therefore, these preventive measures will limit viral transmission. Since the beginning of the outbreak of COVID-19 and in line with the available evidence, WHO has maintained the recommendation regarding precautions against droplets and contact for the use of medical masks (N95, FFP2

or FFP3) for regular patient care and care with COVID-19 respirators, mainly due to circumstances and configurations in which the generation of aerosols can happen during procedures with the patient⁽⁹⁾.

CASE DEFINITIONS

According to the WHO, where it periodically updates the Global Surveillance for human Coronavirus infection - COVID-19⁽⁹⁾.

Suspected case

A. A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory illness, such as cough and shortness of breath), and without another etiology that fully explains the clinical presentation: a history of travel or residence in a country/area or territory that communicates local transmission in the last days.

B. A patient with any acute respiratory illness, and there was contact with a confirmed or probable case of COVID-19, in the last 14 days before the onset of symptoms.

C. Patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease, such as cough and shortness of breath) that requires hospitalization, and without another etiology that fully explains the clinical presentation.

Probable case

A suspicious case for whom the test for COVID-19 is inconclusive, reported by the laboratory.

Confirmed case

Person with laboratory confirmation of COVID-19 infection, regardless of clinical signs and symptoms. ■

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