Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 5 Issue 5 May 2021

Mini Review

Does COVID-19 Spread Slow or Fast in African Countries? A Narrative Review Article 2021

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Received: March 30, 2021

Published: April 28, 2021

Abstract

In African countries, the number of new coronavirus cases is increasing. The virus has hit most African countries. However, the degree is less than that of China, the United States and Europe. On February 14, it was confirmed that the coronavirus pandemic had spread to Africa.

Keywords: COVID-19 in Africa; COVID-19 Pandemic

Introduction

The coronaviruses mentioned in the literature are related viruses that cause animal and human diseases. In humans, coronaviruses can cause mild respiratory infections, such in some cases and other potentially fatal colds, such as severe acute respiratory syndrome, SARS, MERS and COVID-19 in the Middle East. Symptoms vary greatly between different species, such as upper respiratory tract disease in chickens and diarrhea in cattle and pigs [1]. It belongs to the Orthocoronavirinae subfamily of the Coronaviridae family, the Nidovirales Order and the Kingdom of Riboviria. The outer shell of the virus carries the positive sensory genome of single-stranded RNA and the helical symmetry of the side nucleotides. The genome size of a coronavirus is approximately 27 to 34 kilobases, which is the largest among known RNA viruses [2]. The name of the coronavirus is derived from the Latin word "corona", which means "halo" shape. It displays a unique appearance under a two-dimensional transmission microscope because its surface is covered with a rod-shaped protein tip.

Transmission

It is believed that the spread of coronavirus from person to person is mainly due to the close contact due to respiratory droplets produced by sneezing and coughing. Infection occurs when the viral spike glycoprotein (S) binds to its complementary receptor on

the host cell. The host cleaves and activates the spike protein that binds to the receptor. Depending on the host cell protease available at the time of entry, cleavage and activation enable the virus to enter the host cell through direct fusion of the virus envelope with the host membrane or through endocytosis [3]. When it enters the host cell, the virus particle is not covered by an envelope, and its genome enters the cytoplasm of the cell. The RNA genome of the coronavirus has a 5'-methylated cap and a 3'-polyadenylic acid tail, which allows RNA to bind to the ribosome of the host cell for translation [4]. The host ribosome forms a longer polyprotein after the initial overlap of the viral genome and translation of the open reading frame. The polyprotein has its own protease, which breaks down the polyprotein into many non-structural proteins [5].

Symptoms

Most people infected with the COVID-19 virus have mild to moderate respiratory diseases and can recover without special treatment.The elderly and people with underlying medical problems such as cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious diseases [6]. People inject the virus for two weeks before symptoms appear. The most common in the literature are fever, fatigue and dry cough. Also some atypical symptoms such as runny nose and diarrhea were noticed. Recovery from illness, in most cases, does not require special treatment. However, this disease can be serious or even fatal. According to recent research, the risk categories of severe COVID-19 diseases include: 1/65 years and older 2/residents of nursing homes or long-term care facilities 3/patients with underlying diseases of all ages, mostly in poorly controlled situations bottom, including: A-patients with moderate to severe asthma or chronic lung disease; B-people with severe heart disease; C-people with weakened immunity; many conditions can lead to immunosuppression including diabetes, hypertension, Human immunodeficiency virus (HIV), cancer treatment, organ transplantation, and long-term use of corticosteroids and other drugs that weaken the immune system. D- obese people (40 years old and above). Cyborg with diabetes. F-People with chronic kidney disease who are on dialysis. G-People with liver disease. The complications of the disease are: acute respiratory failure, acute respiratory distress syndrome, pneumonia, acute liver injury, acute heart injury, acute kidney injury, secondary infection, septic shock, diffuse intravascular coagulation and rhabdomyolysis [7].

Investigations

All COVID-19 tests must be conducted in consultation with a healthcare provider. The following instructions describe clinically established self-extracting methods. For the initial diagnostic test for COVID-19, the Centers for Disease Control and Prevention(CDC) recommend taking upper respiratory tract samples and testing them. Nasopharyngeal (PN) samples are the preferred option for SARS-CoV-2 swab testing [8]. If a nasopharyngeal swab is not available, acceptable alternatives are: oropharyngeal specimen or a nasal mid-turbinate swab (NMT) (with a sharp, fluffy swab) removed by a professional medical staff or collected on site, or from the front (anterior nares specimen). NMT swab is put regularly in the transport tube containing the virus transport medium, Amis transport medium or sterile saline solution. If N and O are collected at the same time, they should be combined in a test tube to maximize test sensitivity and limit test resources. There is no specific treatment or vaccine, but it is important to detect the disease early and isolate the patient immediately. According to the latest guidelines, the diagnosis of COVID-19 should be confirmed by reverse transcription polymerase chain reaction (RT-PCR) or genetic sequencing of breath or blood samples as an important indicator of hospitalization. Taking into account the limitations of specimen collection, transportation and kit performance, the overall RT-PCR positive rate of throat swab specimens at the first appearance is 30% to 60%. Due to the low sensitivity of RT-PCR, a large number of recovered COVID-19 patients cannot be identified quickly and may not receive appropriate treatment. Since the risk of virus infection is high, there is also a risk of infection. Early diagnosis of COVID-19 is essential for treatment and control. Compared with RT-PCR, .imaging can be a more practical, reliable, and faster method for diagnosing and evaluating COVID-19, especially in outbreak areas. Recent studies have shown that the sensitivity of C.T scan to COVID-19 infection is 98%, while the RT-PCR sensitivity is 71% [9].

Treatment

There is currently no special medicine that can be used to treat coronavirus disease. People may need supportive therapy to help them breathe. Self-care: If a person has mild symptoms, they should stay at home until they recover. Resting at home can relieve symptoms. Stay warm, drink plenty of water, use a humidifier or

take a hot bath to relieve sore throat and cough. The average time from onset to clinical recovery in mild cases is nearly two weeks, and in severe or severe cases it takes three to six weeks.

Prevention

Various types of vaccines have been made. Protection instructions: Wash your hands regularly with soap and water or alcohol-based hand massage for 20 seconds. When coughing or sneezing, cover your mouth and nose with a tissue or bend your elbows. Avoid close contact with unhealthy people (1 meter or 3 feet). If you feel uncomfortable, please stay at home and isolate yourself from others. If your hands are not clean, do not touch your mouth, nose or eyes. The best way to slow down the spread and prevent infection is to understand the COVID-19 virus, the disease it causes and how it spreads. People need to protect themselves and others from infection through good hand hygiene or the use of alcohol disinfectants frequently and don't touch their faces. It mainly comes from saliva droplets when coughing or sneezing or the nasal mucus of an infected person; therefore, it is very important to follow breathing etiquette (for example, coughing when the elbow is bent). Possible treatments have been evaluated in many clinical studies [10].

Discussion

In African countries, the number of new coronavirus cases is increasing. The virus has infected most African countries. However, the degree is less than that of China, the United States and Europe. On February 14, it was confirmed that the coronavirus pandemic had spread to Africa. The first confirmed case was in sub-Saharan Africa. Most of the confirmed cases are from China, Europe and the United States. African countries are worried about the pandemic of the disease, and inadequate health systems will make it difficult to control the disease. In terms of factors affecting the spread of COVID-19 infection in African countries (mainly sub-Saharan Africa), these factors are high temperature and high humidity. As we all know, high temperature and humidity will reduce the spread of influenza and SARS [11]. Recently, there was no direct evidence that temperature and humidity have an impact on the spread of COVID-19. So far, people have not been aware of the activities or behaviors of the COVID-19 virus in various peak periods. Influenza viruses are more stable at lower temperatures, and respiratory droplets (such as a container containing the virus in dry air) stay in the air for longer [12]. In addition, other cold and dry climates also weaken the host's immune system, making it more vulnerable. The second hypothesis regarding the spread of COVID-19 infection in African countries, especially in sub-Saharan countries, is immune factors. We assume that many people do not have antibodies for many COVID-19 variants [13]. There is no clear information about the underlying mechanism of the host's genetic resistance to COVID-19 infection. The entry of viruses is controlled by specific cellular receptors. Once the virus enters, the factors expressed by the host cell restrict or cause the virus to grow. The host's immune system determines the fate of the virus, whether it is killing the virus or spreading the virus. The genetic resistance to the COVID-19 virus depends on three hosts mechanisms of resistance: 1-Control the level of cell receptors.2-Gene control at the level of macrophages 3-Gene control at the level of cellular immunity [14]. There are no clinical studies supporting the natural immunity theory of Africans. In some people, the immune system may be very active, while in others, its effectiveness may be much lower. Therefore, it plays a role in preventing infection. As stated in the literature, scientists from the Pasteur Institute and CNRS studied the immune responses of 200 Africans and Europeans. They show that there are indeed differences; in the population's response to infection, the response is mainly controlled by genetic factors. Their first observation was that for genes involved in inflammation and antiviral responses, Africans and Europeans have significantly different immune responses [14]. These differences are mainly due to genetic variation. This finding helps clarify why some people are more susceptible to the virus than others. The third hypothesis is the link between the COVID-19 virus and malaria: Malaria is a widespread infectious disease in the tropics and sub-Saharan regions. Six African countries account for more than half of all malaria infections worldwide (Nigeria, Congo, Uganda, Mozambique, Côte d'Ivoire and Niger). Low morbidity and mortality rates have been reported in malaria endemic regions compared to nonendemic [15]. Does the pressure of the malaria epidemic seem to be protecting certain populations from the COVID-19 outbreak, or does the mechanism of action of certain anti-malaria drugs suggest that they may play a role in chemopreventive epidemics? There are four hypotheses that malaria has a protective effect on the recently circulating COVID-19 virus: 1-The new adjustment of malaria may limit the spread of COVID-19. According to certain variants of the

ACE2 receptor used by the COVID-19 virus to infect cells, they can protect these populations [16]. 2-Chloroquine and its derivatives are used in the treatment of malaria in African countries; it is also used in the treatment of certain autoimmune diseases in Western countries.The first SARS epidemic has scientifically proven the effectiveness of these drugs against β-COVS syndrome. The mechanism of action of antimalarial drugs increases the endosome Plasmodium, prevents the infusion between the virus and the cell or destroys the glycosylation process of the cell receptor. In addition, it is believed that the COVID-19 virus has an immunomodulatory effect, which can improve its effectiveness. Therefore, it can be assumed that the use of chloroquine and other antimalarial drugs in African countries is an accidental chemoprevention against the B-ACVs epidemic and may slow the spread of COVID-19 [17]. 3- The development of anti-GPI antibodies in patients with malaria can recognize SARS-CoV-2 glycoprotein and protect against COVID-19, or can be infected with mild diseases [18]. 4-Patients with blood type O have a lower risk of malaria, which is mainly because the infectious agent mimics antigen A or B same as what happens in COVID-19 infection. Since the virus can have an ABH structure in the envelope glycoprotein, natural antibodies against the blood tissue group can play a role in antiviral immunity [19].

Conclusion

In conclusion we found out that African countries are experiencing an increase in the number of new coronavirus cases, but at lower paces. There is no clinical study to aid the theory that Africans have natural immunity, but in favor of antiviral immunity we assume the contribution of: The presence of a new adaptation in malaria, Chloroquine, anti-GPI antibodies and blood group O patients.

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