

## **A new outbreak: COVID-19 (SARS-CoV-2) and nutrition**

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### **Abstract**

Covid-19 outbreak has began in December 2019 in China; has been effective worldwide. Unfortunately, information about this virus transmitted from person to person is not clear yet. The virus has been spreading around the world for about 21 months and still infects many people. Although the spreading rate has been taken under control in some countries, the number of cases and deaths is increasing day by day. Studies have increased day by day and vaccination studies have started to give results. As a result, efforts to vaccinate people have started in many countries approximately 8 months. It is stated Covid-19 is not much different from Sars and Mers. This review is aimed to provide a review about general information of Sars-CoV, Mers-CoV and Covid-19; to explain structure, infection of Covid-19 and preventing methods for virus; to report the latest data about the outbreak all over the world.

**Keywords:** Covid-19, SARS, MERS, infection, worldwide

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### **1. Introduction**

A epidemic pneumonia occurred in December 2019 in Wuhan, China. The illness rapidly across the country in a month. The pathogen of this disease previously has been confirmed as a new coronavirus 2019 (2019-nCoV). However, the World Health Organization announced a new name as the new coronavirus disease (COVID-19) on February 11, 2020 [1-3].

The Covid-19 virus outbreak has been determined to begin from a local sea food market. Live wild animals such as bats, frogs and snakes are mostly sold in the sea food market of Huanan (Wuhan, China) [4].

In the first reports it was stated that the virus was not transmitted from person to person. However, as a result of the studies, some individuals who do not visit the seafood market in Huanan (Wuhan, China) have also been found to have this virus [4]. So it has been proven the disease to be transmitted from person to person. COVID-19 was declared as a global epidemic by the World Health Organization on March 11, 2020 [5].

In this review article, it is aimed to provide a review about general information of SARS-CoV, MERS-CoV and COVID-19; to explain structure, infection of Covid-19 and preventing methods for the virus; to report the latest data about the outbreak all over the world.

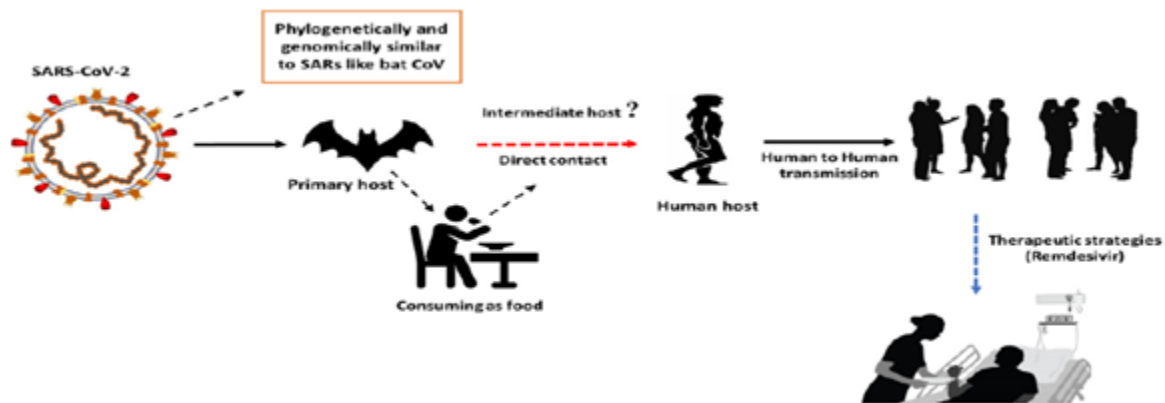
### **2. SARS-CoV**

(SARS-CoV) virus is a pathogen mentioned as severe acute respiratory syndrome included in the betacoronavirus group [6]. This pathogen is also known to infect humans and animals. Some viruses don't infect people first but it can infect humans through animals and cause epidemics (Figure 1) [7]. Reservoir the intermediate host of SARS-CoV, which are bats, is the musk cat [8]. The emergence of new coronavirus types at certain intervals in humans due to high spread rate and wide distribution of coronaviruses, the increase in human-animal interactions with genetic diversity and continuous recombination of genomes [2,9]. 79% similarity was found between SARS-CoV and SARS-CoV-2 (COVID-19) [10].

SARS affected 8098 people in the Far East in late 2002 and early 2003 and caused deaths [4].

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**Figure 1.** Ways (animal to human; human to human) of transmission of SARS-CoV [4]

The incubation period of this infection varies from 2 to 10 days. It shows flu-like symptoms such as fever, chills, cough, and headache. It hasn't been observed high fever in every elderly individual infected with the SARS-CoV virus. In some cases with high fever, it resolved until respiratory symptoms appeared. The case death rate is between 3% and 16% across 26 countries in the world [11]. Diarrhea has been reported in 25% of patients [12]. The disease has manifested more severely in the elderly and people with liver disease. Respiratory distress started within 2-4 days of symptoms of cough and fever. Deaths occurred in 10% to 20% of patients due to damage to the lungs and alveoli [13]. SARS-CoV has been reported to affect a small number of children [14].

### 3. MERS-CoV

MERS-CoV virus is a pathogen mentioned as Middle East respiratory syndrome included in the betacoronavirus group [6]. Reservoir the intermediate host of MERS-CoV, which are bats, are camels [8]. It has been determined that there are many coronavirus species that have not been transmitted to humans yet, but are detected in animals [15].

MERS-CoV caused an epidemic only one decade later than SARS-CoV-2 in Middle Eastern countries [16]. MERS-CoV caused the death of many people in Saudi Arabia and other Middle Eastern countries in 2012. It has been reported to have a 30% mortality rate [17]. 59% similarity was found between MERS-CoV and SARS-CoV-2 (COVID-19) [10].

The incubation period in this infection varies between 3-14 days. At the end of this period, symptoms of high fever, headache, respiratory failure, dry cough, muscle and joint pain were determined. It has been reported that infections are more common in patients accepted as a risk group have chronic heart, lung, kidney disease and especially elderly patients [18].

### 4. COVID-19 (SARS-CoV-2)

It is called 'Corona' due to the spiny protrusions on their surfaces (Figure 2). Coronaviruses cause various diseases in humans and animals. Human coronaviruses (HCoV) were first described in the 1960s. Seven types of Coronavirus, known to cause disease in humans, have been identified. 229E, NL63, OC43 and HKU1 are typical in humans. It has been reported to cause mild / moderate respiratory diseases. It is known that OC43 and NL63 coronaviruses are more common in children, epidemics in winter, and 229E is rare [19,20].

The incubation period of the COVID-19 virus varies between 2-14 days [21]. There are symptoms such as fever, dry cough, muscle pain, fatigue and diarrhea that vary according to the physicochemical and biological features of the patient [22]. It has been stated that Covid-19 virus can be transmitted directly or indirectly from bats to people [21].

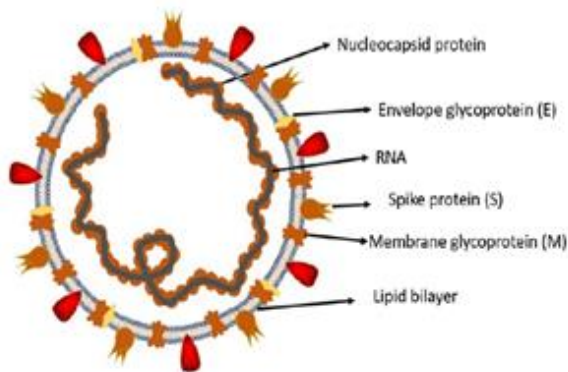
There are two ways of coronavirus transmission: the first is human-to-human transmission. Arising from coughing and sneezing of the infected person, the droplets can be carried with the breath of healthy people and carried to the lungs by mouth and nose. The second way of transmission is contamination by touching the infected surface or objects. The person

may be infected by touching the area with the virus and then touching the mouth or face [2].

It was stated that COVID-19 aerosols were suspended for three hours experimentally. Coronaviruses are generally sensitive viruses to outdoor environment, alcohol and disinfectants, but can survive up to 72 hours on plastic and steel surfaces and 24 hours on cartons [23,24]. The number of children infected with COVID-19 is much lower than that of adults (about 0,3%). There is not enough information finalized about its effect on children. It has been observed that the infection is generally transmitted from family members. Some infected children have been found to have symptoms of mild upper respiratory tract infection. Most of the cases improved within 1-2 weeks. No deaths were detected in children [25].

### 5. Structure of Coronaviruses

Coronaviruses are in the orthocoronavirinae subfamily of the Coronaviridae family. There are four types of Orthocoronavirinae family; alpha, beta, gamma and delta. SARSCoV, MERS-CoV and SARS-CoV-2 (Covid-19) are located in the sub-genus Sarbekovirus in the genus Betacoronavirus. Coronaviruses are large, positive-polarized, enveloped (Figure 2), size ranging from 26 to 32 kbs in length, spherical or poliomorphic ribonucleic acid (RNA) viruses, ranging in size from 80 to 120 nm [7,26-28].



**Figure 2.** Structure of SARS coronavirus [4]

### 6. Infection

Infection begins with the interaction of the virus with specific proteins on the host cell surface. After the interaction of the receptor, viruses fuse their envelopes with the host cell membrane. The aim is to deliver the nucleocapsids to the target cell. For

this, spike protein plays an effective role. It takes part in receptor binding and membrane fusion. Fusion occurs with large conformational changes of Virgo protein. In the host cell, S, M and N structural proteins are combined, placed in the golgi apparatus with the endoplasmic reticulum, and it is combined with virus RNA and other helping proteins. The new viruses are created. The virus produced in the host cell is released from the host cell through exocytosis and they can cause infections anymore [26,27]. The disease symptoms observed in people infected with Covid-19 and the results of three different studies related to this are shown in Table 1 [29].

### 7. Prevention Methods

Infected people should be asked to apply to separate areas in the hospital in order to prevent the spread of the disease. Patients who may be infected with Covid-19 should be given priority in the survey. During the hospital follow-up of the patients, medical personnel, who will come in contact with a distance of more than one meter, long arm gowns, medical masks, face protectors, glasses, masks are recommended. Patients should placed single, if possible should be placed in negative pressure rooms. Medical materials to be used should not be taken out of the room [33].

In case of traveling abroad, people should be at least 1 meter away from people who have problems such as fever and cough. Crowded environments should be avoided at the same time. Hands should not be taken to the face and eyes, shaking hands should be avoided. In the absence of an emergency situation, health centers should not be consulted; soap-water or alcohol-based hand disinfectant (average 70% alcohol) should have used and should have taken attention on hand hygiene. Attention should be paid to personal balanced and regular nutrition, raw milk and animal products should not be consumed. Considering that the virus spreads from animals to humans, contacting with wild and domestic animals should be avoided. It has been reported Covid-19 is to be sensitive to peroxyacetic acid and chloroform, and even more sensitive to chlorhexidine [20,30].

Antibiotics are of no use in CoVID-19 treatment. It is stated that the effects of antivirals are not proven. There is no drug to be given to all patients. Patients with respiratory failure, severe pneumonia, general condition disorder and persistent high fever should receive treatment in intensive care units. Depending on the course of the disease, oxygen support should

**Table 1.** Clinical symptoms of Covid-19 patients

| Study               | Chen et al. [30] | Huang et al. [31] | Chung et al. [32] |
|---------------------|------------------|-------------------|-------------------|
| Patient count       | 99               | 41                | 21                |
| Age (mean, year)    | 55.5             | 49                | 51                |
| Fever               | 83%              | 98%               | 67%               |
| Cough               | 81%              | 76%               | 43%               |
| Shortness of breath | 31%              | 55%               | –                 |
| Myalgia             | 11%              | 44%               | 3%                |
| Haemoptysis         | –                | 5%                | –                 |
| Sputum production   | –                | 28%               | –                 |
| Confusion           | 9%               | –                 | –                 |
| Sore throat         | 5%               | –                 | –                 |
| Rhinorrhoea         | 4%               | –                 | –                 |
| Chest pain          | 2%               | –                 | –                 |
| Diarrhoea           | 2%               | 1%                | –                 |

be provided. Simple antipyretics can be used against fever. Face mask should be used, the face should be closed by using the elbow in sneezing / coughing. Hands should be washed frequently for at least 20 seconds. Items should not be shared. When used, it should be cleaned well. If the symptoms of the disease are increasing, apply to the hospital for medical assistance [17].

### 8. Nutrition in quarantine

Other than vaccine, there is no effective treatment method for this virus yet. So “quarantine” application has been started to minimize the risk of people getting into each other. Quarantine causes a person to live a sedentary life by keeping them away from daily routine life. Increased spending time at home, increased anxieties, increased desire for emotional food (especially carbohydrate foods), and decreased physical activity can cause undesirable increases in body weight. There is no food that prevents or treats transmission of COVID-19 disease; so a balanced and regular diet should be considered to keep immunity strong by providing weight control. It is important to choose healthy foods containing serotonin. Bulgur, chickpeas, turkey meat, fish, dairy products, banana, pineapple, plum, walnut, hazelnut, dried fruit, spinach and eggs are some of these foods [34-37].

Due to the decrease in physical activity in the quarantine period, the energy to be taken in daily nutrition should be less than before quarantine. Physical activity level should be increased with exercises to be done at home. Prepared foods and pastries should be avoided. The desire for dessert should be fulfilled with dried fruits, fresh fruits and milk desserts, paying attention to their frequency. Foods rich in fruits, vegetables and whole grains

with low saturated fat content should be preferred. These foods have both serotonin and tryptophan. Consideration should be given to legume and pulp consumption. The daily consumption of antioxidants, vitamin D, omega 3, zinc, prebiotics and probiotics should be paid attention. Water should be consumed in sufficient quantities; it is recommended to use olive oil in meals. Nutritious, long shelf life, durable foods should be purchased as much as possible during the quarantine process. Since vegetables and fruits are not durable, some of them can be frozen and stored in appropriate amounts for later consumption and / or cooking. Vegetables and fruits should be washed well and hygiene rules should be observed [38-40].

### 9. Covid-19 in the world

The World Health Organization publishes the daily global COVID-19 status report from January 21, 2020. Accordingly, on January 21, the total number of cases was 282 (98.6% in China) [41].

With the onset of the outbreak, research has been undertaken in many countries on COVID-19 disease and the SARS-CoV-2 virus. There are many unexplained issues related to COVID-19 disease. Scientists, from all over the world to detect them, conducts research [15].

The epidemic process that started with the detection of the first case in Turkey on 11 March 2020, continues. According to WHO data on September 24, 2021; the number of infected people with Covid-19 has approached 230 million and so far about 4,7 million people lost their lives for this reason. The number of cases and deaths continues to increase continuously in many countries. Countries with the highest number of approved cases are America (42 million), India (33.5 million), Brazil

(21. million), United Kingdom (7,5 million), respectively. Turkey (6.9 million) is in lower ranks. The highest number of approved deaths are America (677 thousand), Brazil (592 thousand) and India (446 thousand) respectively; 62.5 thousand death is determined in Turkey [41].

## 10. Conclusion

The virus spreads especially as a result of close contact. Therefore protective measures should be taken against infection. To reduce the risk of contamination measures must be followed. Information about the SARS-CoV-2 virus is increasing day by day. Although it is estimated that the possible source of the virus that caused the epidemic was a bat, its exact source is not known at the moment. However, the molecular, immunological and genetic bases of the virus, routes of transmission, pathogenesis of disease formation are not fully known. Increasing studies on this will increase the speed of virus control.

**Compliance with Ethics Requirements.** The author declares that she respect the journal's ethics requirements. The author declares that she has no conflict of interest.

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