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A Review on COVID-19: Origin, Spread, Symptoms, Treatment, and Prevention

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Abstract: A novel type of coronavirus, identified as 2019-nCoV or COVID-19, appeared in Wuhan, China, in late 2019 and continued to spread in 2020. On January 24th, 2020, about 830 cases were reported in nine countries, namely: China, Japan, Singapore, Thailand, South Korea, Nepal, Vietnam, the United States, and Taiwan. Also, about 26 confirmed deaths have been recorded, especially for patients with serious underlying diseases. On March 11th, 2020, the World Health Organization (WHO) declared COVID-19 as a global pandemic. Until June 3rd, 2020, this outbreak virus caused over 6,500,000 detected infection cases in 210 countries and territories and around 383,000 confirmed death cases. Although information about the appearance of the virus, i.e., its origin and capacity to spread among people, is still unclear, there are growing numbers of cases that are occurring from the communication of infected people with uninfected ones. 2019-nCoV is the third coronavirus which was detected in humans in the past two decades, after SARS-CoV and Middle Eastern Respiratory Coronavirus (MERS-CoV) that appeared in 2002 and 2012, respectively. In this review, we summarized the up-to-date information regarding COVID-19's origin, ways of spread, patients' symptoms, treatment, and prevention.

Keywords: COVID-19; cough; SARS-CoV; RNA; 2019-nCoV; coronavirus

1. Introduction

Coronavirus (CoV) belongs to the family of single-stranded RNA viruses, that relates to the order of Nidoviral. This order contains, in general, the families of Coronaviridae, Roniviridae, and Arteriviridae. The Coronaviridae family can be divided into Coronavirinae and Torovirinae; however, it can also be divided into alpha, beta, gamma, and delta [1-6]. The viral RNA genome length could extend from 26 to 32 kPa and insulated from diverse kinds of animals, such as cats, birds, camels, dogs, bats, mice, and livestock [7-10]. The proliferation and spread of CoVs put the human in serious nursing conditions. The first detection of the MERS-CoV virus was in Saudi Arabia in 2012, where about 2,494 cases were registered, among them 858 cases of death. In 2002, a subspecies of beta volatile organic compound quickly spread to Guangdong, China, where the epidemic left 8,000 people hurt and 774 dead in 37 countries [11-18]. The pandemic in 2020 was introduced as pneumonia of unknown

causes in China. Laboratory investigations and a series of reports have recognized the attacker as a different strain of coronaviruses [19-25]. At first, the virus was classified as 2019-nCoV; also, it was classified as SARS-CoV-2, according to the International Classification of Viruses (ICV) [26-30]. The nowadays most famous name of this new virus is COVID-19, which was stated by the World Health Organization published on February 11th, 2020.

2. Origin and spread

In December 2019, in Wuhan, adults went to local hospitals with the severe respiratory syndrome for an unknown reason. The control system (developed after SARS disease spreading) and patients' respiratory samples were sent to reference laboratories to discover the cause. On December 31st, 2019, China informed the WHO about the outbreak, and on January 1st, 2020, Huanan seafood shops were closed. On January 7th, the virus was recognized as a coronavirus that has about 95% symmetry with coronary bat virus and about 70% similarity to SARSCoV. Samples that were taken from the Huanan seafood market's objects and animals were also positive, indicating that this virus is generated from seafood [31-38]. Next, the case numbers started to increase steadily, suggesting that person-to-person transmission occurred because some of these cases have not present in the animal market [39-46]. On January 11th, the first fatality case was reported due to Chinese heavy transportation through the Chinese New Year, which fueled the pandemic. The population of Wuhan is around 11 million, where they were put into custody with entry and exit restrictions. Soon, this virus spread to other cities in Hubei province. On January 23rd, other cases appeared (very quickly) in Japan, South Korea, and Thailand besides China. [47-53].

The infection continued with a sharp increase; modeling reports have resulted in a multiple pandemic time of 1.8 d [53-59]. On February 12th, the definition of confirmed cases, including patients with negative/suspended molecular tests, was changed by China. Thereby, the medical, radiological, besides epidemiological COVID-19 profiles were updated and lead to a rise in cases by about 15,000 in one day. On March 3rd, 2020, around 96000 cases around the world (80,000 in China) were confirmed, located in 87 countries and 1 international transportation facility (696 in the Diamond cruise ship). The number of new cases has dramatically increased in new countries, such as Iran, South Korea, and Italy, while it started to decrease in China simultaneously. Today, COVID-19 cases in China has the lowest growth rate comparing with other high cases countries, and the outbreak seems to be almost in control.

3. Symptoms

Almost similar to its predecessor, SARS, the symptoms of COVID-19 make infected people feel with symptoms like the flu ones. Though symptoms appeared on infected people could differ from a person to another; this virus is affecting different people in different ways. Most of the infected people could experience mild to moderate symptoms. The symptoms are "commonly" fever (>38 °C), fatigue, and dry cough [60-65]. Some people may experience aches and pains, nasal congestion, cold, sore throat, dyspnea, and diarrhea. Recently, the center of disease control (CDC) has added symptoms that may be felt by infected people, namely, chills, muscle aches, trembling, headaches, and loss of smell and taste. It may take an average of 5-6 days for the infected person to show symptoms, but in some cases, it could take up to 14 days [66-72].

4. Treatment

First of all, isolation must be applied in order to prevent transmission of infection to new contacts. Mild illnesses should be treated at home while maintaining the ill person's body hydrated, controlling fever and cough, consuming nutrition, and using antibiotics regularly. It was suggested by China Oseltamivir Guidelines to avoid antivirals in short-term treatment; also, corticosteroids could be used in acute respiratory distress syndrome (ARDS) COVID-19 [73-75]. The WHO has published a detailed guide for critical care management, which could be updated according to new findings [18-25]. There is no fully approved therapy for COVID-19 yet, although researches are still ongoing. Antiviral drugs, for example, ribavirin and lopinavir/ritonavir, were found beneficial based on the experience from SARS and MERS. Before recommending these drugs, we need more evidence. Further medicines are suggested for pro treatments, such as chloroquine, arbidol, intravenous immunoglobulin, plasma, and interferon [2, 55-58], in addition to using traditional Chinese herbs [76-77].

Grein et al. conducted a study of using remdesivir on 53 patients who received at least one dose of the medication. Basically, 30 patients, 57% of the total number, needed mechanical ventilation, and 4 patients (8%) have treated with extracorporeal membrane oxygenation. The follow-up period was 18 days, where 36 patients (68%) experienced an increase in oxygen support, including 17 among 30 patients (57%) who received extubated mechanical ventilation. It was reported that 25 patients (47%) have successfully recovered, and seven patients (13%), unfortunately, died. Death cases were 18% (6 out of 34) among patients who received invasive ventilation and 5% (1 of 19) among those who did not obtain invasive ventilation [78].

In a study by Shen et al. [79] about administrating blood plasma therapy obtained from COVID-19 patients who had recovered, 5 patients received mechanics ventilation. After treated with plasma transfusion, body temperature became normal in 3 days for 4 out of the 5 patients, sequential organ failure assessment (SOFA) scores decreased, and P_{AO2} / F_{IO} increased in 12 days (range: 172-276 before and 284-366 after). Viral load also decreased and became negative within 12 days after the transfusion. From this achievement of their clinical findings, it can be concluded that the administration of plasma is quite effective, but because the sample is limited, further clinical trials are needed with a larger sample size [79].

5. Prevention

It is important to prevent this disease because there is no reliable treatment since the disease is not fully identified. Reports started to show up claiming that a vaccine and/or medication were found, but it could take up to a year to be used since it takes several stages to be approved finally. However, this made prevention difficult due to the possible chance of infection even before symptoms onset. Therefore, approved or expected cases should be isolated at home, where ventilation and sunlight should be allowed. A mask is required to be worn for the patients and care providers while they are in contact or in the same room with patients, and must wash their hands frequently with soap and water or use hand sanitizer each 15-20 min.

Regarding the community level, people are required to keep social and physical distancing, avoid swarming places, and delay or cancel the unnecessary trips. They must also practice cough hygiene via coughing in sleeves/ tissues instead of hands, in addition to practicing hand cleaning every 15-20 min. Furthermore, surgical masks should be used for patients with respiratory symptoms. The WHO banned the public use of respirator masks and

restricted their use for health workers. While healthy people are recommended to wear cloth masks when they show up outside or in public areas. Recently, China has enacted legislation prohibiting the sale and trade of wild animals [80-91]. Also, some countries have conducted lockdowns and multiple social restrictions to break the chain of COVID-19 transmission [92-101].

6. Conclusions

The outbreak of this new virus has affected public, economic, and medical health infrastructure in almost all countries worldwide. Only time will reveal the impact of this virus's on our existence here in Iraq, Indonesia, and the other countries. Therefore, future outbreaks of viruses and pathogens from animal origin can continue. Hence, regardless of the way of curbing the outbreak of this disease, additional efforts are needed to develop thorough actions and avoid outbreaks of zoonotic and non-zoonotic diseases in the future. Ultimately, it is required for people to adhere to general cleaning teachings, the etiquette of hygiene, and avoid eating raw foods and forbidden meat.

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Conflicts of Interest

The authors declare no conflict of interest.

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