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Current Situation of Coronavirus Disease: (COVID-19) Review Article

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Abstract

COVID-19 is a type of coronavirus disease belonging to the family Coronaviridae. The disease is thought to originate from bats and was spread to people through an unknown medium in Wuhan, China. Ideally, the condition is spread by inhalation or close interaction with infected droplets that have an incubation period between two and fourteen days. Today, there are thousands of infections and deaths that have been caused by the disease. Moreover, the symptoms of the disease include fever, cough, sneezing, sore throat, difficulty breathing, and tiredness. Additionally, the diagnosis of the disease starts by gathering samples of the upper and lower respiratory tracts of the infected person. Also, chest X-rays and CT scan are used in the diagnosis stage. Basically, there is no precise treatment for the ailment, and this calls for the need to prevent the disease from spreading. Notable prevention strategies are isolation of the infected persons, proper ventilation, hand hygiene and use of personal protective equipment. Therefore, this paper provides in-depth information on COVID-19 as it discusses the disease epidemiology, transmission, clinical features, diagnosis, treatment and prevention.

Keywords: COVID-19, Acute respiratory syndrome; Multiorgan dysfunction; Chest X-rays, CT scan

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Introduction

COVID-19 epidemic is the major global health disaster today and the supreme challenge to the universe. Ideally, COVID-19 is an enclosed RNA virus that is distinctly present in people and animals. The virus belongs to the Nidovirales order that consists of families, namely, Roniviridae, Arteriviridae, and Coronaviridae [1,2].

At the same time, the Coronaviridae family is divided into two, which include Torovirinae and Coronavirinae. Further, the Coronavirinae subfamily is classified as into alpha-, beta-, gamma-, and delta- COVs [1]. These viruses have virus-related RNA genome that measures from 26 to 32 kilobases in dimension, and this makes it possible to isolate them from different animal species. Moreover, the coronaviruses can be seen under the electron microscope as it possesses a crown-like appearance. Ideally, the extensive spreading and associated health risks of the disease make it an essential pathogen. Primarily, human types of coronavirus are linked to minor clinical symptoms. Simultaneously, the World Health Organization (WHO) have conducted studies and lab research to identify the new strain of COV, designated as COVID-19 [3-22]. On the other hand, the International Committee on Taxonomy of Viruses referred to the disease-causing virus as the SARS-CoV-2 virus.

As a result, the way the illness spread from person-to-person has made it a public threat [17]. In this case, COVID-19 is extremely transmissible, and this calls for the need to understand its epidemiology, transmission, clinical features, diagnosis, treatment, and prevention so as to gain insight about the disease.

Epidemiology

All ages are at risk of getting the illness. This is because the ailment is transmitted through large droplets that result from coughing and sneezing by symptomatic individuals. In some instances, the infection can happen from asymptomatic individuals and before the beginning of symptoms. As of March 2020, the WHO announced that there are about 87,317 cases of COVID- 19 globally as well as confirmed cases of deaths is 2,977 [1,23-29]. This implies that the disease symptoms are mild as only 3.42 per cent of patients with it have died because of the virus. At the same time, the high number of incidences and deaths have been identified in China. It is that 92 per cent of the total number of occurrences have been reported in Asia, mainly China [30]. Importantly, the confirmed incidences are clinically identified and laboratory-confirmed. Further, outside Asia, the number of cases and deaths differs due to the ongoing nature of the disease, population density, degree of testing and reporting, and timing of reducing strategies [6]. The features of COVID-19

are categorized into the host of the virus, transmission mode and incubation period [5]. In the first place, the Chinese horseshoe bat is the natural hosts and the terminal hosts are humans [10]. Also, the transmission is from individual to individual through aerosol droplets. Lastly, the incubation period varies from two to fourteen days. Therefore, COVID-19 cumulative incidence differs depending on the country and incidences have been confirmed in almost all continents.

Transmission

COVID-19 can be transmitted through direct exposure to infected animals, human-to- human, and environmental contamination. Firstly, the initial cases of COVID-19 are associated with direct contact to infected animals and this was experienced at the seafood marketplace in Wuhan, China [2]. Moreover, the virus can spread from one person to another, and this is considered to be the main form of transmission [4]. It is that the interaction with those with the disease can lead to getting the ailment as spreading happens from the release of respiratory droplets, mainly through coughing. Therefore, close contact with individuals with COVID-19 can result in transmission. In some instances, there is a possible spreading in closed areas because of raised aerosol concentrations [3]. Several studies support that the COVID-19 virus has a development period of two to fourteen days [1]. Equally important, the virus can spread through touching contaminated surfaces. This happens when it touches these surfaces and then transfer the virus to mucous membranes in the upper parts of the body, especially mouth, eyes, or nose [7]. It implies that the virus remains active in surfaces that individuals are likely to touch on a daily basis. As a matter of fact, environmental contamination is more likely to be a possible source of infection in environments where there is heavy viral contamination, mainly in an infected person's household [18]. As research is done in Singapore reveals that viral RNA is detected on nearly all surfaces, such as handles, light switches, toilet bowl, and bed and handrails [2]. Necessarily, COVID-19 can persist in surfaces as it has been tested and confirmed that this virus may persist on inorganic surfaces for up to six to nine days without disinfection [20]. Hence, COVID-19 can be transmitted in different ways, and this calls for the need for individuals to be aware of its transmission so as to keep themselves safe all the time.

Clinical features

The clinical features of this ailment vary, extending from an asymptomatic state to acute respiratory distress syndrome to septic shock and multi-organ dysfunction. Ideally, this ailment is categorized depending on its severity and this include mild, moderate, severe, and critical [28]. The shared symptoms of individuals with the disease include fever (98.6 per cent), tiredness (69.6 per cent), dry cough, and looseness of the bowels [2].

Mild Illness

Individuals with the minor ailment may present signs of a respiratory tract viral contamination. Noticeable symptoms are dry cough, slight fever, nasal infection, sore throat, malaise, muscle pain and headache [11]. A recent study supports that 81 per cent of the COVID- 19 incidence are mild in severity [14]. At the same time, individuals with minor illness can rapidly worsen into critical cases.

Moderate Illness

Individuals with the moderate disease are likely to present symptoms that are different from those of mild illness. Moderate disease symptoms include cough, breathing difficulty, and tachypnea [28]. In this stage, there are no symptoms of serious ailment.

Severe Illness

Individuals with serious illness are likely to displays symptoms such as pneumonia, acute respiratory distress syndrome, and septic shock [13]. In this stage, diagnosis is medical, and health problems can be left out with the aid of radiographic research. Importantly, 5 per cent of individuals with the illness can acquire a serious ailment with signs of respiratory failure, RNAemia, cardiac complications or multiple organ dysfunction [5]. Further, the mortality rate for critical clients is 49 per cent. Also, individuals with other health complications have a higher mortality rate. Specifically, these health complications are diabetes (7.3 per cent), respiratory ailments (6.5 per cent), heart disease (10.5 per cent), high blood pressure (6 per cent), and oncological problems (5.6 per cent) [29]. This data indicates that individuals without other health complications have a lower mortality rate.

Acute respiratory distress syndrome

The onset of Acute Respiratory Distress Syndrome indicates deteriorating respiratory failure [15]. It happens as a difficulty within first one week of clinical confirmation. The degrees of PaO_2/FiO_2 are utilised to differentiate Acute Respiratory Distress Syndrome based on changing degrees of hypoxia [9]. When the PaO_2/FiO_2 value is less than 100

mm Hg, it designates Acute Respiratory Distress Syndrome is severe. Similarly, when the value is between 100 mm Hg and 200 mm Hg, it indicates a reasonable Acute Respiratory Distress Syndrome. Further, the diagnosis of mild Acute Respiratory Distress Syndrome is displayed by values between 200 mm Hg and 300 mm Hg [9]. In addition, chest imaging technologies, mainly chest X-ray, CT scan and lung ultrasound can be utilized to sustain the diagnosis. Occasionally, a CT scan is used because of its accuracy in detecting symptoms [29]. Contrariwise, a chest X-ray is not used most of the times because it has a lower sensitivity of 59 per cent to detect subtle opacities.

Sepsis and septic shock

Individuals with ailment and sepsis are noted to be severe of them all. The reason is that multiorgan dysfunction increases the severity of the disease.

The signs and symptoms of organ dysfunction are serious dyspnea, low oxygen saturation, minimized urine production, high blood pressure and altered mentation [23]. Moreover, clients with septic shock are determinedly hypotensive in spite of volume resuscitation.

Diagnosis

The United States Centers for Disease Control and Prevention has developed criteria to use for a person under investigation. Ideally, if an individual is under investigation, immediate control and management measures are commenced [2]. Simultaneously, clinical factors are utilised to evaluate the necessity for testing. This involves close interaction with a disease-confirmed client within fourteen days of symptoms. Also, it may include travel history to an infected region within fourteen days of symptoms beginning [3]. Precisely, WHO endorses gathering samples from individuals with COVID-19 [27]. Then, the samples are evaluated for viral RNA by means of the polymerase chain reaction. When the test outcome shows positive, it is suggested to repeat the test for the purpose of verification. On the other hand, if the test confirms negative, this warrant repeat testing. Also, chest X-ray and CT imaging are used to identify COVID-19 in suspect individuals with adverse molecular diagnosis.

Treatment

The initial step in treating those suspected to have COVID-19 is adequate isolation in order to prevent spread to other contacts, clients, and healthcare providers [8]. The mild disease should be administered at home through staying hydrated, proper nutrition, monitoring fever and cough [21]. Besides, the repetitive usage of antibiotics and antivirals, mainly oseltamivir, should be evaded among those with COVID-19 symptoms [14]. This portrays that there is no specific treatment for this ailment.

Prevention

Since there is no precise treatment for this disease, prevention is critical. In the first place, isolation of the suspected cases with the minor disease at home is suggested [24]. Again, proper ventilation with good sunlight to destroy the virus is recommended at home [25]. Further, individuals suspected to have the disease should be asked to wear a surgical mask and to rehearse cough hygiene [26]. Primarily, healthcare workers should wear a surgical mask when in the same area as a client and utilize hand hygiene in every 15 minutes. This is because the most significant risk of the disease is transmitted to healthcare professionals as they are the ones dealing with patients on a daily basis [19]. Hence, it is accurate to state that prevention of COVID-19 includes isolation, proper ventilation, hand hygiene and use of personal protective equipment, especially as surgical masks, eye protection, gloves, and gowns [4].

Conclusion

COVID-19 outbreak has challenged almost all sectors due to the spread of the disease at an alarming rate across the globe. Notably, COVID-19 is an RNA virus that poses a threat to public health. Currently, the disease has caused thousands of infections and deaths. Ideally, the rapid spread of the ailment calls for strong investigation and isolation protocols to avert additional spread. Fundamentally, no confirmed medicine or vaccine has been created to improve the health of patients with the condition. Therefore, individuals need to take measures such as isolation, proper ventilation, hand hygiene and use of personal protective equipment, mainly surgical masks, eye protection, gloves, and gowns to safeguard themselves from the disease.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable

Availability of data and materials

Not applicable

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Not competing interest

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