



Coronavirus (COVID-19)- A Pandemic Causing Global Lockdown

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Abstract

COVID-19 is caused by the virus SARS-CoV-2 and appeared in Wuhan, China, in late 2019. It is characterized by the appearance of symptoms such as pneumonia or bronchitis. The virus seems to usually cause a milder infection in children than in adults or older people. Currently no treatment or cure is available for COVID-19 and development of a vaccine is currently under trial. However in order to prevent the spread of COVID-19 infection, it is recommended to avoid contact with the infected individual and observed social distancing.

Keywords: Furin; Bronchitis; Pneumonia; Chloroquine; Remdesivir; Spike proteins

Abbreviations: SARS-CoV: Severe Acute Respiratory Syndrome Coronavirus.

Introduction

Cases of SARS-CoV (severe acute respiratory syndrome coronavirus) infection was first reported in Guangdong City, China in 2002 as an uncommon life-threatening pneumonia leading to respiratory failure in many cases [1,2]. The virus quickly spread from continent to continent affecting 29 countries resulting in an infection of approximately more than 8000 people [3,4]. Coronaviruses are enveloped, single stranded RNA viruses containing approximately 26,000 to 32,000 bases [5]. There are seven human coronaviruses such as HCoV-HKU1, HCoV-229E, HCoV-OC43, HCoV-OC43, SARS-CoV, HCoV-229E and HCoV-NL63 [6,7]. COVID-19 is caused by the virus SARS-CoV-2 [8] and appeared in Wuhan, China, in late 2019 [9]. Since the outbreak it spread across China to other countries and has been declared a public health emergency of international concern by the WHO [10].

COVID-19 Structure

SARS-CoV-2 is spreading at an exponential rate resulting in 82,000 infections following 2,800 deaths within two months since its outbreak [11]. And globally,

168,000 COVID-19 infections have been identified [12]. The microscopic structure of the virus SARS-CoV-2 reveals that it has a surface protein known as spike protein (upto1255 amino acids) that binds tightly to the receptors (ACE2) of its host cells to produce infection [13]. The binding mechanism is aided by a specific host cell enzyme known as furin which is present in most of human organs such as intestine, liver, lungs etc. Thus allowing the virus to easily attack multiple organs at once [14]. The furin cleavage site in SARS-CoV-2 spike proteins also contributes towards virus stability and easy transmission [15].

COVID-19 Spread

Coronaviruses are transmitted from animals to humans i.e. zoonotic [16]. COVID-19 may have been passed from bats to another animal and then to humans as the researcher believes [17]. Its transmission was reported to in the open sea food market in Wuhan, China [18].

COVID-19 Symptoms

The apparent symptoms of COVID-19 are sore throat, fever, cough, pneumonia, respiratory illnesses such as nasal obstruction, bronchitis, cilia damage, alveolar interstitial fiber cell hyperplasia, fibrotic lung disease etc. [19,20].

COVID-19 Diagnosis

COVID-19 infection is diagnosed in patients using their blood, saliva, or nostrils sample [21]. In addition, coronavirus fully automated RT-PCR testing kits currently is the gold standard for diagnosis [22].

COVID-19 Complications

The virus seems to usually cause a milder infection in children than in adults or older people [23]. One of the most severe complications of COVID-19 infection is the symptom of pneumonia that causes severe acute respiratory distress syndrome, fatigue, arrhythmia, myalgia, heart attack and severe muscle pain leading to the death of the infected [24,25]. Moreover studies reported that this virus is gradually mutating thus decreasing the chance of it altering to become more fatal [26].

COVID-19 Prevention

In order to prevent the spread of COVID-19 infection, it is advisable to avoid contact with the infected individual. In addition social distancing is recommended [27]. On the other hand personal hygiene should be maintained following hand washing with a soap for 20 seconds which will break viral membrane [28], use of disinfectants for cleaning, wearing masks when going outside to prevent exposure, avoid gatherings during infection breakout, use 60% alcohol containing sanitizer at all times etc. [29]. Ultraviolet light and heat disrupts the genetic material (RNA) of the virus and its spike proteins structural integrity respectively [30,31].

COVID-19 Treatment

Currently no treatment or cure is available for COVID-19 and development of a vaccine is currently under trial [32]. In case an individual is diagnosed with such an infection, treatment is focused on reducing the apparent symptoms of the disease such as using retroviral medications, steroids, blood plasma transfusions etc [33]. In addition, research on designing furin inhibitors and blocking ACE2 receptors may be another viable solution to stop this virus [34]. And likelihood of developing antibodies against COVID-19 is also under investigation [35]. There are presently no precise drugs treatments for this virus. However HIV drugssuch as lopinavir and ritonavir [36], antimalarial drugs such as chloroquine and antiEbola drug such as remdesivir [37] are being tested in COVID-19 infected individuals.

Conclusion

Thus COVID-19 is a pandemic causing global lockdown. However by improving personal hygiene and following social distancing we can prevent its spread.

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