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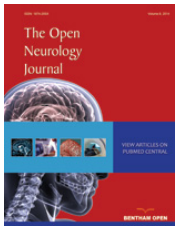

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EDITORIAL

Update on Coronavirus Disease 2019 (COVID-19)

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Among the emerging infectious diseases, the respiratory illness caused by a novel coronavirus, now named Coronavirus Disease 2019 (COVID-19), became a major concern worldwide due to the impact on global health and the serious social and economic consequences of this pandemic outbreak.

Human infection with the novel coronavirus causing COVID-19 first began in December 2019 in Wuhan, Hubei province, China, and rapidly spread within the country and later to a growing number of countries [1]. To date, more than 100 000 people have been infected globally in more than 100 countries, about 80, 000 within China. Europe is currently the epicenter of the pandemic and Italy, Europe's worst affected country, with more than 20 000 infected people and more than 1400 deaths according to data available on March 14, is now on lockdown. On March 11, the General Director of the World Health Organization declared COVID-19 a pandemic, pushing the threat beyond the global health emergency he had announced in January 2020.

This is a rapidly evolving situation, requiring a continuous update as soon as new information becomes available. Here we propose a brief review of the latest knowledge on the current coronavirus disease pandemic.

The virus causing COVID-19, formerly called 2019-nCoV and now taxonomically termed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a new strain of coronavirus previously not identified in humans. Coronavirus is a single-stranded, enveloped RNA virus which is characterized by spike proteins projecting from the virion surface. The spherical morphology of the viral particle, together with the spike projections, led to the name coronavirus, due to the crown-like appearance under the electron microscope. Before the discovery of the SARS-CoV-2, six coronaviruses were known to infect humans. Four of these (HKU1, NL63, OC43, and 229E) cause mild to moderate upper respiratory disease, and are responsible for 10%-30% of common cold. Two other coronaviruses have caused outbreaks of severe respiratory illness in humans: SARS (Severe Acute Respiratory Syndrome), which emerged in Southern China in 2002, and MERS (Middle East Respiratory Syndrome), which emerged in the Middle East in 2012. Sequence analysis of SARS-CoV-2 showed that it is most closely related to a bat SARS-like coronavirus and shares about 80% sequence homology with SARS CoV [1, 2]. Given its close similarity to bat coronaviruses, it is likely that bats are the primary reservoir for the virus and that an intermediate host, not yet identified, facilitated the emergence of the virus in humans [2].

The virus spreads mainly from person-to-person through respiratory droplets produced when an infected person coughs or sneezes, as well as influenza and other respiratory pathogens spread [3]. The number of infected cases to date reveals a very rapid and efficient human-to-human transmission.

The source of infection is symptomatic cases, but published data demonstrated that SARS-CoV-2 could spread even before the onset of symptoms [4 - 6]. Infection from relatively asymptomatic individuals justifies the lack of identifiable exposures in many confirmed cases. The virus transmission may also occur by touching a contaminated sur-face or object and then mouth, nose, or eyes. Available data on the persistence of all coronaviruses, including SARS-CoV and MERS-CoV, indicate that human coronaviruses can remain inf-ectious on inanimate surfaces for several hours up to 9 days [7].

SARS-CoV-2 RNA has also been detected in blood and stool specimens, suggesting a potential transmission by blood transfusion or a fecal-oral transmission [8, 9].

The virus enters into human airway epithelial cells through receptor-mediated endocytosis. Several cellular receptors were described as receptors for CoVs. In particular, the angiotensin-converting enzyme 2 (ACE2) was identified as the receptor for SARS-CoV and possibly for the newly discovered SARS-CoV-2 [10].4

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The median incubation period after contact with an active case is around 5 days (2-14 days). Frequently reported signs and symptoms at illness onset include fever, cough, myalgia or fatigue and shortness of breath [11].

Patients with COVID-19 show a wide spectrum of disease severity. Most patients have mild disease, whereas about 25% can progress to the severe life-threatening stage of the disease, usually characterized by severe pneumonia and acute respiratory distress syndrome [11].

Progression to lower respiratory tract has generally been observed in the second week of illness. Possible risk factors for evolution to severe illness may include but are not limited to, older age and underlying chronic medical conditions, such as lung disease, cancer, heart failure, cerebrovascular disease, renal disease, liver disease, diabetes and immunocompromising conditions [11].

Among hospitalized patients with pneumonia, the case fatality proportion has been reported as 4–15% [12 - 14], while the total estimated mortality rate is 2%-3%.

Diagnosis of COVID-19 should be based on detection of SARS-CoV-2 nucleic acid by real-time reverse transcriptase-polymerase chain reaction (RT-PCR) in respiratory specimens, including nasopharyngeal or oropharyngeal swabs [15].

There are no approved therapeutic agents available for the treatment of COVID-19, and therapy currently consists of supportive care. Several investigational approaches are being explored, including lopinavir-ritonavir, remdesivir, chloroquine, monoclonal antibodies [16 - 20]. A vaccine against COVID-19 is still under development [21].

Nevertheless, the best way to prevent infection is to avoid being exposed to the virus. Community-based interventions such as school dismissals, event cancellations, social distancing, and creating employee plans to work remotely can help to slow the spread of COVID-19. Individuals can also take personal action to prevent transmission of COVID-19 by adopting everyday prevention measures like frequent hand washing, staying home, covering mouth and nose with a disposable tissue when coughing or sneezing.

In summary, the Covid-19 pandemic, the first pandemic sparked by a coronavirus, is a serious threat to public health, a global challenge never seen before. Every effort is required to better understand the disease, to control its spread and to mitigate the impact of the pandemic, trying to reduce the burden and pressure on the healthcare system, allowing more time for the testing of therapeutics and vaccine development.

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