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Natural history of COVID-19 and Coronavirus Disease

Gibran Mark*

UNICANCER, Institut Paoli-Calmettes, Department of Radiation Oncology, 13009 Marseille, France

Corresponding author: Gibran Mark

Gibra_Mark@gmail.com

UNICANCER, Institut Paoli-Calmettes, Department of Radiation Oncology, 13009 Marseille, France

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Abstract

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that caused the COVID-19 pandemic and emerged in late 2019 still lacks a vaccine, despite intensive research. One of the most pressing issues affecting global public health is this transmissible disease. Infection prevention and control measures involving supportive care, such as supplemental oxygen and mechanical ventilation, have been the sole focus of COVID-19 clinical management. In the meantime, research is going on to find a treatment that works to stop the virus from spreading, reduce symptoms, extend life expectancy, and lower mortality rates. Based on the body of clinical knowledge gathered from infected patients regarding the natural history and evolution of the infection, a number of drug classes, many of which are already used to treat other diseases, are being evaluated.

There is another general wellbeing emergency undermining the world with the development and spread of 2019 novel Covid (2019-nCoV) or the serious intense respiratory disorder Covid 2 (SARS-CoV-2). In December 2019, the virus was spread to humans in Wuhan, Hubei Province, China, by unknown intermediary animals. Bats were the source of the virus. To date, approximately 3300 deaths and 96,000 cases of coronavirus disease 2019 (COVID-2019) have been reported. The disease is spread through inhalation or contact with infected droplets and has an incubation period of 2 to 14 days. Common symptoms include fever, cough, sore throat, difficulty breathing, fatigue, and general malaise. Most people have a mild case of the disease; It may progress to pneumonia, ARDS, and multiorgan dysfunction in some people. A lot of people have no symptoms. The estimated rate of case fatalities is between 2% and 3%. Special molecular tests show the virus in respiratory secretions to make a diagnosis. Normal or low white cell counts and elevated C-reactive protein (CRP) are common laboratory findings. Even in patients with mild disease or no symptoms, the computerized tomographic chest scan typically shows abnormalities. The majority of the treatment is supportive; The function of antiviral agents is still unknown. In hospitals, strict infection control measures, including droplet and contact precautions, and the isolation of suspected cases and mildly ill patients at home are both part of the prevention strategy. The virus kills fewer people than its two ancestors, Middle East respiratory syndrome coronavirus (MERS-CoV) and SARS-CoV. This new epidemic's global impact is still uncertain.

Keywords: Vaccine; SARS-CoV-2; COVID-19; Pneumonia; Respiratory syndrome coronavirus-2; Transmissible disease; Oxygen; Mechanical ventilation

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Introduction

The severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) or 2019 novel coronavirus (2019-nCoV), as it is now known, is rapidly spreading from Wuhan City in Hubei Province, China, to the rest of the world [1]. 96,000 cases of coronavirus

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disease 2019 (COVID-19) and 3300 deaths have been reported as of 05/03/2020. India has so far reported 29 cases. Fortunately, children have not been harmed and no deaths have occurred thus far. However, the virus's future trajectory is unknown. An overview of this new virus is provided in this article. Readers are encouraged to keep themselves informed on a regular basis due to the rapid advancement of virus knowledge [2].

The World Health Organization declared Coronavirus Disease 2019 (COVID-19) a pandemic on March 11, 2020, primarily due to the rapidity and scale of the disease's spread. Before that, it was an epidemic on the mainland of China, with the first reports made on February 26 in Wuhan, Hubei province [3]. COVID-19's etiologic agent was initially identified as 2019-nCoV, a novel coronavirus. Later, the virus's genome was sequenced because it was genetically related to the coronavirus outbreak that caused the 2003 SARS outbreak; The International Committee for the Taxonomy of Viruses gave the virus the name severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) as its scientific name [4].

Although the initial cases have been linked to the Huanan South China Seafood Market, where snakes, birds, and other animals like bats were sold, the SARS-CoV-2's origin and source remain unknown. In light of the fact that, in contrast to the exported cases, many of the early patients worked in or visited the market, either a human-to-human transmission or a more widespread animal source was suggested [5]. After proving 96 percent genome sequence identity between SARS-CoV-2 and another coronavirus named Bat-CoV-RaTG13 that was isolated from bat species that colonized a province that was nearly 2000 kilometers away from Wuhan, a possible bat origin was suggested. Additionally, the natural host of coronaviruses was proposed to be pangolins [6, 7]. However, on January 22, 2020, following a WHO delegation's visit to Wuhan, strong evidence of human-to-human transmission emerged. The disease spread rapidly throughout the world beginning with the first outbreak in February 2020. As of June 17, 2020, according to the European Center for Disease Control and Prevention; since the 31st of December in 2019, there have been 8,142,129 COVID-19 cases and 443,488 deaths worldwide [8]. The United States of America and Brazil topped the list of countries with the most cases on the American continent. SARS-CoV-2 is an enveloped virus with a positive-sense, single-stranded RNA of 29,891 bases that is part of the beta subgroup of the Coronaviridae family. 29 proteins involved in infection, replication, and vision assembly are encoded in the genome [9]. They are distinguished from other coronaviruses by the presence of surface spikes that resemble crowns. A receptor binding domain (RBD) on the spike S protein of SARS-CoV-2 binds the human angiotensin-converting enzyme 2 (ACE2), thereby facilitating membrane fusion and virus entry into human cells via endocytosis. The coronavirus genome's most variable region is the RBD in the spike protein. RBD from SARS-CoV-2, according to structural and biochemical studies, binds to ACE2 with a higher affinity than RBD from other SARS-CoV viruses. However, the high binding affinity may also be due to the variability of the human ACE2 protein [10].

Conclusion

Even though many people around the world are trying to find a drug that works against SARS-CoV-2, no one can agree on a specific treatment for COVID-19. While there is still no effective vaccine, the use of repurposed medications has proven to be an effective alternative with promising outcomes. We included only the most important drugs and treatments that, as of June 13, 2020, had been tested and found to be effective against the SARS-CoV-2 virus. However, the outcomes that have been achieved thus far when repurposed drugs have been used with caution. Unfortunately, the media and politics' intense focus on the pandemic and the growing death toll have led to the publication of a few small or insufficient studies on humans with questionable empirical clinical data, many of which lack the necessary scientific rigor. There has been a lot of discussion about this fact. As a result, there has been a lot of misinformation and confusion, which has slowed down important steps to fight COVID-19 and caused science to be unfairly discredited.

The economic, medical, and public health infrastructures of China and, to some extent, other nations, particularly China's neighbors, have been challenged by this new virus outbreak. Our Indian lives will be affected by the virus only over time. Furthermore, zoonotic virus and pathogen outbreaks are likely to continue in the future. Therefore, efforts should be made to devise comprehensive measures to prevent future outbreaks of zoonotic origin in addition to containing this outbreak.

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