

COVID-19 pathophysiology

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Abstract

SARS-CoV-2, caused a series of acute atypical respiratory diseases in Wuhan, Hubei Province, China. The disease caused by this virus was termed COVID-19. The virus is transmittable between humans and has caused pandemic worldwide. The number of death tolls continues to rise and a large number of countries have been forced to do social distancing and lockdown. Lack of targeted therapy continues to be a problem. Epidemiological studies showed that elder patients were more susceptible to severe diseases, while children tend to have milder symptoms.

Keywords: COVID-19 • Children • Pathophysiology •

Introduction

It was soon exposed that a novel coronavirus was responsible. The novel coronavirus was named as the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2, 2019-nCoV) due to its high homology (~80%) to SARS-CoV, which caused acute respiratory distress syndrome (ARDS) and high mortality during 2002–2003 [1]. The disease produced by this virus was called Coronavirus disease 19 (COVID-19) and a pandemic was declared by the World Health Organization (WHO). COVID-19 has been affecting a large number of people worldwide, being reported in approximately 200 countries and territories as of April 7th, 2020, around 1,400,000 cases worldwide have been reported according to the center for Systems Science and Engineering (CSSE), SARS-CoV-2 virus primarily affects the respiratory system, although other organ systems are also involved. Lower respiratory tract infection related symptoms including fever, dry cough and dyspnea were reported in the initial case series from Wuhan, China [2].

Respiratory symptoms of COVID-19 are extremely heterogeneous, ranging from minimal symptoms to significant hypoxia with ARDS. In the report from Wuhan mentioned above, the time between the onset of symptoms and the development of ARDS was as short as 9 days, suggesting that the respiratory symptoms could progress rapidly.

Epidemiological data of COVID-19

The percentage of children within the total COVID-19 patients was small. Rendering to the data of the Chinese Center for Disease Control

and Prevention (China CDC) from February 2020, children younger than 10 years of age and within the age of 11–19 years occupied 1% each of the total cases this may indicate less prevalence of COVID-19 in pediatric population. However, this may be underestimation of actual occurrence in pediatric population if less tests were undertaken in children due to less symptoms. Among the children for whom complete information was obtainable, only 73% developed fever, cough, or shortness of breath. That's compared to 93% of adults reported in the same time frame, between the ages of 18 and 64 years. The estimated hospitalization rate for children aged 1 to 17 was 14% at most [3].

Regarding the severity of COVID-19, there is a rising interest in the relationship between the severity of disease and gender. Although the Chinese series showed equal number of cases between females and males, the data suggested that more men than women suffered from severe disease and died [4].

Conclusion

The pandemic by COVID-19 is a live issue affecting people worldwide. Without fundamental therapeutic interventions, current management is to reduce the virus spread and afford supportive care for diseased patients. There is an urgent need to develop targeted therapies. Sympathetic the difference in pediatric and adult responses to this virus may help to direct immune based therapeutics.

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