

Chapter 3

OVERVIEW OF POSSIBLE PREDICTORS OF MORTALITY IN COVID-19 PATIENTS

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INTRODUCTION

In late December 2019, serious cases of pneumonia of unknown cause began to appear in Wuhan, China. On 7 January 2020, virus was identified as coronavirus and on January 12 named as 2019 novel coronavirus (2019-nCoV) (1). Later on pairwise protein sequence analysis showed that the virus belongs to the species of severe acute respiratory syndrome related coronaviruses. The virus was renamed as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the disease caused by this virus was called coronavirus disease 2019 (COVID-19) (2). On March 11, World Health Organization declared that COVID-19 is a pandemic. Till 29 September 2020 around 33.7 million cases and more than one million deaths were reported in 213 countries and territories (3).

Observed case-fatality ratio (the number of deaths divided by the number of confirmed cases, CFR) of COVID-19 differs from country to country and varies usually between 0.5% and 10%. However, there are some exceptions such as Yemen with CFR of 28.9% and Singapore with CFR of 0%. Differences in CFR can be caused by the number of people tested, demographics of population, characteristic and burden of the healthcare system, and other unknown factors (4).

The most common symptoms in COVID-19 patients are fever, dry cough and tiredness while the most serious symptoms are shortness of breath, chest pain and loss of speech or movement (5). A great majority of COVID-19 patients have mild to moderate respiratory disease and can manage their symptoms without treatment. However, one-fifth of the patients are severe or critical cases and need medical attention. These patients are at risk of progressing from acute respiratory distress syndrome to multiple organ dysfunction or

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>389 U/L increased the risk of ICU admission by 3.3 fold while LDH >460 U/L increased the risk of death by 5.8 fold (10). Besides these urea was also found to be a risk factor for mortality. In a study it was showed that patients with urea level > 7 have increased risk of death (16).

Current studies report that approximately one-fifth of COVID-19 patients have abnormality of the coagulation function and increased risk of thrombosis, thus, may cause to the progression of the disease to critical stage or death (17). A study assessing association between coagulation parameters and prognosis found patients with fatal outcome had higher levels of D-dimer. In the same study, it is stated that D-dimer was prominently elevated in the non-survivors' last stages (22).

CONCLUSION

Although current studies show some similarities, there is a wide range of risk factors for mortality and also the prediction model in every study is different from the others. Information obtained from the literature so far shows that demographic, clinical and laboratory parameters can be used to predict the risk of disease progression such as ICU admission and mortality in COVID-19 patients. Development of easy-to-use and accurate models for the risk estimation and the use of this predictive models by clinicians can help early identification of patients with poor prognosis. Thus, mortality can be reduced in COVID-19 patients with timely and appropriate intervention.

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