



#COVID-19: Risk Score to Predict Critical Illness



The coronavirus disease (COVID 19) continues to create havoc around the globe. Millions of people have been infected with the virus and thousands have died. The infection is spread via droplet particles. Many infected patients remain asymptomatic; others develop a mild upper respiratory infection-like illness and some develop a serious lung infection that requires admission to the ICU. COVID-19 cases that are of a severe nature are associated with high mortality.

A study was conducted to identify both epidemiological and clinical characteristics that are associated with the development of serious illness in patients with COVID-19. The researchers wanted to know if these factors could help predict which patients would become sicker and whether they would need admission to an intensive care unit, require mechanical ventilation, or die. The ability to predict the seriousness of the disease would enable clinicians to take more proactive measures to manage COVID 19 patients, optimise the use of resources, and decrease high mortality rates.

Methodology and Risk Score

The study involved patients with COVID 19 from 575 hospitals in China. With an initial cohort of 1590 patients and a validation cohort of 710 patients, the researchers developed a validated risk score that helped predict which patients would develop critical COVID-19. They identified ten independent predictors, on the basis of which they developed a risk score (COVID-GRAM).

These risk score predictors included the following: 1) Patient age 2) Abnormality on the chest x-ray 3) Dyspnoea 4) Haemoptysis 5) Loss of consciousness 6) Cancer history 7) Other comorbidities 8) Level of lactate dehydrogenase and 9) Bilirubin and 10) The ratio of neutrophil to lymphocytes. All the epidemiological imaging, laboratory, and clinical variables at the different hospitals were ascertained on hospital admission and a logistic regression was done to construct a predictive risk score.

Critical illness was defined as the composite measure of admission to the intensive care unit, need for mechanical ventilation, or death. COVID-19 diagnosis was confirmed by real-time polymerase chain reaction assay from pharyngeal and nasal swabs.

Results

The development cohort included 1590 patients with a mean age of 48.9 and 904 men. In the validation cohort, there were 710 patients with a mean age of 48.2 and included 382 men. Using the risk model, 24 of the 1590 patients were classified as old and at being high-risk of severe illness. Overall, a total of 131 patients eventually developed critical illness (8.2%). The overall mortality was 3.2% and 1334 patients (83.9%) had a history of exposure to Wuhan.

Based on the data, a web-based risk calculator was developed that was able to predict the development of serious illness among hospitalised COVID-19 patients. The risk score was satisfactory and had a high degree of accuracy if the independent risk factors are taken into account.

However, it is important to keep in mind that the sample size was relatively small for the construction of a risk score. The data are entirely from China and may not be representative of the North American or European populations. Additional validity of the score from studies outside of China are highly recommended before this risk score can be of universal use.

Source: [JAMA](#)

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