AI Tool Helps to Reduce COVID-19 Mortality

A team at Hospital Clinic Barcelona-IDIBAPS has created an artificial intelligence (AI) tool, which stratifies hospitalised COVID-19 patients according to possible symptom complications. In turn, this allows provision of personalised treatment. As a result of this approach, significant reduction in early mortality rates was observed.

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For an observational study (Garcia-Vidal et al. 2020), electronic health record data of 786 patients admitted to Hospital Clinic, Barcelona, with the COVID-19 diagnosis between March 28 and April 1 were analysed. Trained on over a trillion anonymised data points, the AI tool predicted, with 90% accuracy, if individual patients were likely to develop inflammatory, co-infection and/or thrombotic complications. Based on this prognosis, differing therapeutic approaches and personalised treatment decisions were implemented.

Within the analysed sample, 246 patients were identified as belonging to one of the three patterns groups. Of those, 99 (40.2%) underwent a personalised therapy approach, while the remaining 147 (59.8%) did not. The largest group was that with inflammatory pattern (206 patients, 83.4%), followed by thrombotic pattern (24 patients, 9.7%) and co-infection pattern (16 patients, 6.5%).

The condition of 99 patients who received personalised therapy showed an improvement at day five in 93.3% of cases vs. 59.9% among those 147 on standard of care. Early mortality was 2% among the former compared to 17.7% among the latter at day five, and 20% compared to 44.2% at day 28, respectively.

"The artificial-intelligence system that we have built is capable of supporting clinicians in the early diagnosis of patients more prone to develop complications, thus we have been able to provide timely and personalised treatments. This 'Central Control System' can be used for multiple applications beyond COVID-19 and represents a clear example of how AI can improve medicine and health outcomes," said the lead author of the study Carolina García-Vidal, Hospital Clínic de Barcelona.

The informatics tool was developed as part of the ' [Digital Control Centre for COVID-19](#)' project initiated in April 2020 by EIT Health, the EU's European Institute of Innovation and Technology's health arm. It is stressed that the tool is intended to support clinical decision-making at the height of the pandemic, and not to replace clinical judgement.

"In many countries, we are seeing deaths from COVID-19 fall as a result of the highly committed work of our healthcare professionals. Additionally, a greater understanding of the trajectory of the disease and its impact on humans, and the availability of better equipment and technology have armed us in the fight against the disease. I am very proud of the early results demonstrated by our 'Digital Control Centre for COVID-19' project, which has been rapidly implemented and is already showing its potential to save lives. We look forward to further validation and will work to make it available for as many patients as possible across the globe," said Jan-Philipp Beck, CEO of EIT Health.

The researchers point out several limitations to their study, including the small number of patients in the cohort. However, following this initial validation, the tool will now be expanded to other hospitals within the EIT Health network, including institutions in Spain, the Netherlands and Belgium, which will help to collect more data for the project.

Source: EIT Health

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