Applying AI Algorithms to COVID-19

The adage 'necessity is the mother of invention' is all the more true during the COVID-19 pandemic, when scientists are racing to find new vaccines and treatments. Early diagnosis of the disease is another area that needs to be given more focus, since timely and accurate detection of patients with COVID-19 means appropriate therapy can be initiated accordingly.

Chest x-ray and CT are the primary diagnostic imaging tools being used, and there are now large amounts of imaging data on COVID-19 that can support development of machine learning (ML) algorithms for rapid disease identification.

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However, as noted in a new research report (Bachtiger, Peters and Walsh 2020), most imaging research exploring AI applications is focused on diagnosis based on "appearances" observed once the disease has progressed. AI-based solutions can be put to better use by helping clinicians detect COVID-19 at the earliest stages "when initiation of appropriate therapy is likely to be most effective," the report authors explain.

Also, imaging research should look at developing AI algorithms and tools for predicting COVID-19-related outcomes, including mortality, intensive care unit admission, or need for mechanical ventilation. Having these prognostic or predictive AI models is of great importance in the fight against the pandemic, particularly when hospitals are inundated by patients requiring intensive care and ventilation support.

AI-based innovations, according to the authors, should be geared towards addressing pressing clinical problems, such as patient triage. For COVID-19, it is known that patients with comorbid conditions have higher risk of getting infected, although there is also no proven method for identifying patients with no underlying health issues who are likely to get the disease. Hence, development of effective stratification tools to objectively assess patients can aid healthcare frontliners in optimising allocation of scant resources.

In the current pandemic, the authors have cited the "rush" by researchers in reporting accuracy of AI algorithms based on how well these tools perform in clinical scenarios that do not accurately reflect clinical practice. The report authors explain that this is often the consequence when applied AI research is made without expert clinical oversight.

In summary, the authors say closer collaboration between clinical and AI experts is key to identifying the needs for which new innovations will have the greatest clinical value.

Source: The Lancet

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