Artificial intelligence & COVID-19: (bio)ethical aspects of end of life

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Dear Editor,

The disease caused by the SARS-CoV-2 virus (COVID-19) has brought significant challenges to clinical medicine and public health[1] since its appearance in China during the month of December 2019. In fact, this novel virus – whose transmission mechanisms and natural history are still under investigation – has disseminated and grown exponentially regarding the number of infected people[2], on a global scale. In this scenario, there is, naturally, the need to make decisions when faced with questions such as: (1) defining which patients will be given priority in intensive care units[3,4] and (2) whether or not to submit COVID-19 patients to mechanical ventilation[5]. The answers to these questions – that are closely related to (bio)ethical reflections – can be supported by computational techniques, especially those based on artificial intelligence (AI).

A study by Ouyang *et al.*[4] used mathematical modeling to determine what type of screening policy could be useful in ICUs during the SARS-CoV-2 pandemic. The article – whose aim was to find a heuristic to minimize the average global lethality rate over time – analyzed the circumstances in which patients could be placed in line, for admission to a hypothetical ICU with limited beds, or transferred to a general ward as the condition changes. The proposed heuristic worked satisfactorily in the simulation.

Another possible way of applying these techniques concerns the use of AI in determining personalized sedation and analgesia in the case of mechanical ventilation and extubation. In this context, Prasad *et al.*[5] used a reinforced learning algorithm – known as Q-learning – that suggested better decisions than those proposed by specialists regarding extubation time. AI techniques, especially those belonging to the machine learning area, allow for the construction and

extraction of behavioral patterns implicit in decision histories, regarding a problem situation.

Assuming the existence of a database of previous decisions that comprise, for example, the type of care to be used at the end of life or the therapy to be prescribed to a patient, the patterns underlying this data can assist in choosing the most appropriate conduct to be adopted in each situation, provided it is properly extracted. In the current COVID-19 pandemic scenario, in which these decisions become even more pressing, this type of support can be of great value for ethically, more responsible, and fair conducts.

Conflict of interest
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