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CORRESPONDENCE

Incidence of pulmonary embolism in patients with COVID-19

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Dear Editor,

We read with great interest the article by Helms and colleagues [1], "High risk of thrombosis in patients with severe SARS-CoV-2 infection: a multicenter prospective cohort study," published in Intensive Care Medicine in April 2020. In this interesting paper, the authors provide information on the incidence of thrombotic events, especially pulmonary embolism (PE), in patients with acute respiratory distress syndrome (ARDS) due to SARS-CoV-2 infection. This is an important topic that merits further discussion. We have noted a few points that may interfere with the interpretation of the results.

First, the reported incidence of PE of 25% (including three cases of subsegmental PE) on computed tomography pulmonary angiography (CTPA) performed for suspected PE in patients with ARDS due to COVID-19 is not higher than expected. When a two-level classification of the pretest probability of PE is used, a 30% incidence can be predicted in the PE-likely category [2]. We published the results of a retrospective study showing a PE incidence of 30.4% in a medical population of critically ill patients undergoing CTPA for suspected PE [3]. Moreover, in a prospective study, the incidence of PE on CTPA performed for suspected PE was 39% (Girardi et al., data in preparation). Taken together, these results point to a high incidence of PE in critically ill medical patients with respiratory failure, regardless of SARS-CoV-2 infection.

Second, PE is among the most commonly missed deadly diagnoses, possibly because of the low sensitivity and specificity of PE signs and symptoms. In fact, PE is a frequent finding in critically ill patients undergoing autopsy [4]. Historical controls might not have been considered to have PE, mainly outside the pandemic period, and, as expected, have not been subjected to investigation.

Third, D-dimer, a fibrin degradation product that increases in acute thromboembolic events has a very low specificity in the critically ill, because many clinical conditions associated with fibrin formation are present in intensive care unit (ICU) patients [5]. In our study, patients without PE had a median D-dimer level of 3.3 (0.2–36) mg/mL, similar to 2.3 (1.2–20) mg/mL observed in patients with Covid-19 in the study by Helms et al. [1].

Fourth, although prediction scores are not reliable for PE diagnosis in critically ill patients [3], efforts should be made to avoid overtesting with CTPA, as patients can be exposed to undesirable ionizing radiation doses, in addition to the risks of transportation out of the ICU [2]. In the study by Helms et al. [1], CTPA was performed in 66% of patients. Although the percentage of acceptable use of CTPA in critically ill patients is unknown, 66% appears to be higher than recommended, mainly in a population with a well-defined alternative diagnosis to PE.

In conclusion, historical controls are not the best control group. Despite the fact that we are facing new diagnostic and therapeutic challenges in patients with ARDS due to COVID-19, study design should be carefully considered in interpreting the results.

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Compliance with ethical standards

Conflicts of interest
The authors declare they have no conflicts of interest.

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