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Commentary on "COVID-19 pneumonia in the emergency department: correlation of initial chest CT findings with short-term outcome"

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Abstract

On October 15th 2020, the Emergency Radiology Journal published our article entitled "COVID-19 pneumonia in the emergency department: correlation of initial chest CT findings with short-term outcome", that evaluated clinical, laboratorial and imaging findings of laboratory confirmed COVID-19 patients as predictors of severe disease. In this paper, we will explore the context and significance of the early recognition of the disease severity on patients' management.

As the COVID-19 vaccination has started in some countries, a major step was taken into the direction of the pandemic control. The global economy and population devastation caused by the COVID-19 pandemic reached not only the most vulnerable in our society (the risk groups and economically deprived people), but figures as an unprecedented challenge to the public health worldwide. Despite the immunization initiatives, the Duke Global Health Innovation Center in Durham, North Carolina estimates that there will not be enough vaccines to cover the world's population until 2023 or 2024, leaving out especially low-income countries, even though there are ethical frame works to provide fair allocation of vaccines globally[1].

Along with this scenario, because of the easement out of social distancing, many countries now experience a new increase in the number of cases (known as the "second wave", mixed with the "first wave" in many countries), accompanied by an increase in the number of deaths of the disease caused by the SARS-CoV-2 virus. Additionally, the recent identification of mutations in the SARS-CoV-2 spike glycoprotein, resulting in increased transmissibility, has concerned the scientific community about the vaccine effectiveness in these variants. Because of its fast spread, the new variants can outcompete and replace other circulating variants[2]. Whether the mutations will weaken or compromise the vaccines effectiveness by escaping the host antibodies is yet not answered, requiring a large-scale SARS-CoV-2 evolution and host response evaluation. In the light of the above, efforts to improve COVID-19 patients' management are still of paramount importance, since a low seroprevalence is reported by epidemiological studies and most of the world population remains susceptible[3].

Published on October 15th 2020, our article entitled "COVID-19 pneumonia in the emergency department: correlation of initial chest CT findings with short-term outcome"[4] highlighted the radiologic findings, as well as clinical and laboratorial features, associated with severe Coronavirus disease. In this retrospective study, consecutive

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patients admitted in the emergency department (ED) with laboratory confirmed COVID-19, composed predominantly by males with a median age of 52 years, were divided into three groups, according to the short-term outcome: early-discharged from ED, hospitalized on regular wards, and admitted to intensive care unit (ICU). Hospitalization criteria in wards included low flow oxygen therapy, demand of parenteral therapy, mild decompensation of pre-existing comorbidity. ICU admission criteria included high flow oxygen therapy, organic disfunction with advanced life support demand (including patients with significant clinical worsening likely to need it) and moderate to severe decompensation of pre-existing comorbidity.

Low oxygen saturation (SpO2 ≤93%), lymphopenia (lymphocyte count < 900/mm^3) and elevated C-reactive protein (CRP > 5.0 mg/dL) were clinical and laboratorial findings more common in ICU admitted patients than those in regular wards.

The CT analysis revealed that more extensive lung disease correlated with hospitalization and ICU admission. Interlobular septal thickening, a CT feature that may occur due to interstitial pulmonary edema or interstitial injury, occurred more frequently in ICU admitted patients and also correlated with longer ICU stay. Extension of lung disease estimated by visual analysis, diffuse distribution of lung opacities, interlobular septal thickening, consolidation, and pleural effusion correlated with clinical and laboratorial features associated with more severe illness.

The study findings are consistent with previously published articles and additional imaging features as consolidation, peri-bronchovascular involvement of the lungs (a central pattern rather than subpleural), air bronchogram, crazy paving appearance, organizing pneumonia and pleural effusion have also been reported to be significantly associated with ICU admission[5-7].

Although the majority of COVID-19 patients will be asymptomatic or oligosymptomatic, patients with mild symptoms may rapidly progress to respiratory failure and require intubation. Therefore, the knowledge of prognostic factors associated with critical disease is pivotal in many health care situations as aiding triage, referral, treatment, guiding clinical decision-making, early management of modifiable factors and informing individuals about the course of their illness[8].

The prediction of hospitalization and the patient outcomes is likewise fundamental for resources planning, mitigating the burden on the healthcare system, while also prioritizing the appropriate level of care, especially in resource-constrained settings. In addition to the acute phase of the disease, substantial resources are needed to treat patients and help clinicians understand and manage the long-term effects of COVID-19 (defined as the maintenance of symptoms for more than 4 weeks)[9].

Most of the proposed triage protocols to predict mortality and guide clinical decision making are not yet validated[10]. Our study provided data to support clinical decision depending on the patient context, recognizing groups of patients most likely to need intensive care support. The early identification of potentially critically ill patients allows better results, reducing COVID-19 related deaths. Recognizing the disease manifestations related to the patient' outcome is pivotal for risk stratification and improving patient management, leading to better outcomes.

Conflict of Interest

The authors declare no conflict of interest.

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