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Characteristics of critical patients with COVID-19 in a Spanish second-level hospital

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SCIENTIFIC LETTER

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Characteristics of critical patients with COVID-19 in a Spanish second-level hospital

Características de los pacientes ingresados con COVID-19 en la UCI de un hospital de segundo nivel en España

Dear editor,

According to epidemiological data, critical care is needed by 5% of COVID-19 patients [1]. Patients requiring ICU admission exceeded the total capacity of many hospitals, posing national healthcare systems at risk. An impressive effort from ICU teams managed to multiply their capacity by two or three-fold, trying to cover the continuous need for ICU beds [2,3].

We report adult ICU admissions related to COVID-19 at a polyvalent ICU of a second-level hospital, with eight beds available in summer, and 10 in winter (0.47-0,59 ICU beds/10,000 inhabitants). Our goals included to analyse patients' characteristics, identify factors associated with mortality, and share our experience regarding the organisational changes that were made in an environment of care-providing under pressure.

We performed a retrospective study with nasal/throat swabs or bronchial aspirate positive for SARS-CoV-2 by polymerase chain reaction (PCR) hospitalised between March 5th and May 7th, 2020. Patients

transferred to other centres, and those still in ICU were excluded. Treatment adhered to current national protocols. The local IRB approved the study. We analysed clinical characteristics and performed a logistic regression multivariate analysis, including all variables to check the causes and associated factors of ICU mortality. We report numbers (percentages) for binary/categorical variables and medians (interquartile ranges) for continuous variables. Statistical analyses were performed using SPSS 20.0.

During the aforementioned period, 54 patients presented a positive PCR. Forty-eight patients were finally included (excluding six patients remaining in ICU). The median age was 65 years (IQR 59-72). 65.3% were men. 73.5% of the patients had associated comorbidity. The main diagnosis on admission was respiratory failure due to pneumonia (87.8%). Table 1 depicts the characteristics of the included patients. 77.1% of the patients survived upon ICU discharge. Non-survivors were older, presented a significantly higher rate of cardiovascular comorbidities, a higher number of organ failures (especially relevant regarding liver and kidney failure), and an increased need in prone positioning during ICU stay.

We would like to highlight that patients included had a 22.4% mortality during ICU admission. In our cohort, mortality was significantly associated with cardiovascular comorbidities and a higher number of associated organ failures. It should be noted that the published mortality rate is extremely variable, ranging from was 88% for patients who received mechanical ventilation [4] to a reported 26% in an Italian study [5]. Regarding management of respiratory failure and compared to other published studies [6], we observed a higher percentage of invasive mechanical ventilation therapy, with a lower prone rate and a similar use of neuromuscular blockade. Though our initial database was not designed to analyse the effect of the applied treatments, we intend to carry out an analysis in the future that will include it.

These encouraging data have been possible after multiplying our capacity by four and achieving a ratio of 1.8 ICU beds/10,000 inhabitants, reaching a peak of 30 critical patients admitted at the same time, with a maximum of 27 patients under mechanical ventilation on the same day. These results are thanks to an all-around strategy, based on our stable model of "ICU without walls" [7], multidisciplinary collaboration (enabling operating rooms, Major Outpatient Surgery, Reanimation and Emergency Department), maintenance of our protective mechanical ventilation protocol (personalised adjustment of PEEP using, whenever possible, electric impedance tomography), and reinforcement of our follow-up protocol after ICU discharge.

The COVID-19 pandemic has demonstrated the need for quick and innovative response mechanisms. New protocols should cover the growing demands while trying to maintain adequate care for our patients. The challenge remains.

Abbreviations

COVID-19: coronavirus disease 2019

ICU: intensive care unit

PCR: polymerase chain reaction

IQR: interquartile range

CI: confidence interval

SAP3: Simplified Acute Physiology score

SOFA: Sequential Organ Failure Assessment score

OR: odds ratio

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