


LETTER



# One-year mortality after ICU admission due to COVID-19 infection

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Dear Editor,

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection causes severe disease in some patients. Patients can experience severe disabilities after intensive care unit (ICU) admission due to coronavirus disease 2019 (COVID-19) [1]. Nevertheless, it remains unclear how these consequences may increase mortality. Therefore, we aimed to evaluate 1-year mortality in a large cohort of patients in Spain who required ICU admission due to COVID-19.

This is a multicenter, observational and prospective/retrospective study of patients admitted to 60 Spanish ICUs (eTable1) due to COVID-19 infection [2]. The study was approved by the institution's internal review board and registered as NCT04457505. The main outcome was 1-year mortality, which was defined as death during hospitalization or at one point during 1-year follow-up since ICU admission. Patients included in this cohort were either visited or called during this follow-up period to determine survival status.

Of the 3249 patients admitted between February 28 and July 31, 2020, 3210 patients completed 1-year follow-up since ICU admission. Baseline characteristics and complications during ICU admissions are summarized in eTable2. In-hospital mortality rate was 34% ( $n = 1102$ ); 1% of patients ( $n = 28$ ) died after hospital discharge (Fig. 1) (eFig1). One-year mortality was 14% and 40% in

non-invasive ventilated patients (83 of 592 patients) and patients receiving invasive mechanical ventilation (1000 of 2507 patients), respectively. The main causes of death after hospital discharge were out-of-hospital cardiac arrest (10 patients, 37%); infectious diseases (six patients, 21%); and respiratory failure (six patients, 21%) (eTable3). In total, 205 patients visited the emergency department, and 67 patients required readmission after hospital discharge (Fig. 1). The median number of days between hospital admission and mortality in those patients who died while not in hospital was 145 (interquartile range 39–215).

In this study, we found that 1-year mortality was 35% for patients admitted to the ICU for COVID-19. Only 1% of patients discharged died within the first year of follow-up. Mortality observed after hospital discharge was lower than that reported in other studies on COVID-19 [3]. When compared with other causes of pneumonia, long-term mortality related to COVID-19 is lower as well. Indeed, mortality rates in severe community-acquired pneumonia rose from 27% at 30 days to 47% at 1 year [4], mainly due to cardiovascular events [5]. Mortality rates did not increase despite the well-known fact that severe COVID-19 causes disabilities as a result of post-intensive care syndrome and long COVID [1]. The reason as to why these patients had lower mortality and readmissions after discharge remains unclear; however, close follow-up, fewer comorbidities and less cardiovascular sequelae may provide an explanation for such an observation. Hospital-acquired pneumonia was more common in those patients who died after hospital discharge in comparison to patients who survived after 1-year follow-up, indicating a potential marker of poor prognosis.

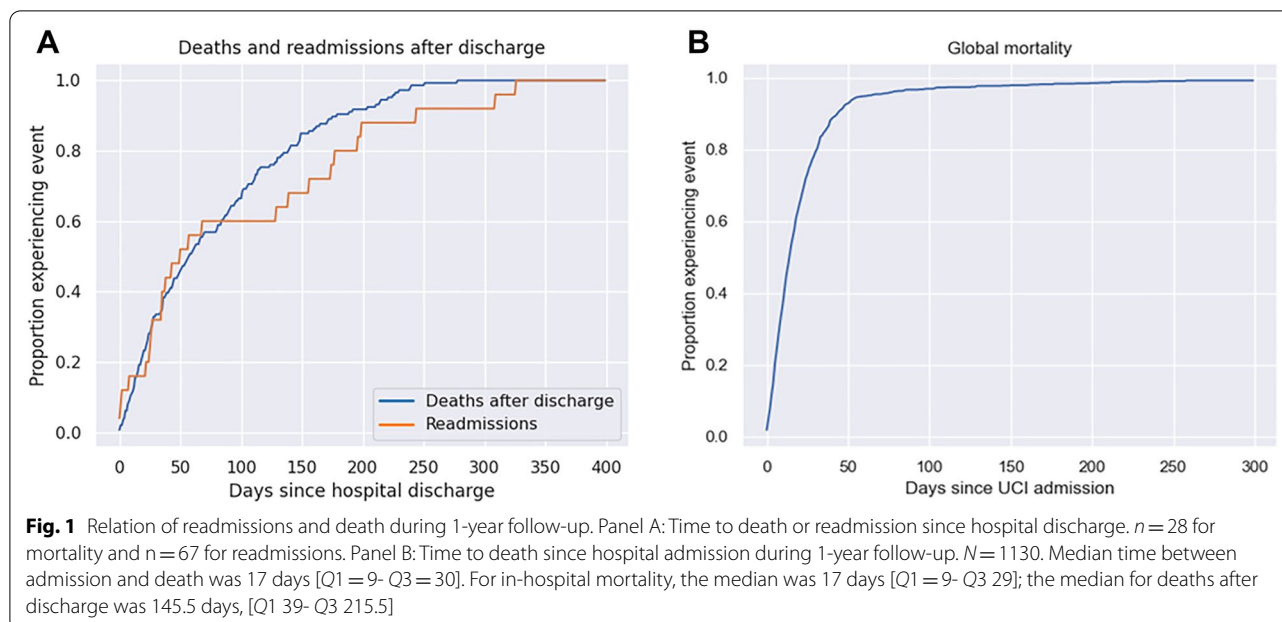
The main limitation of this report is the inclusion of patients from the first wave of the pandemic when the

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healthcare system was overwhelmed. The main strength of this study is the presentation of well-collected data from a nationwide cohort, including out-of-hospital deaths; there were few missing data in terms of follow-up.

In conclusion, among patients admitted to the ICU for COVID-19 and who were later discharged alive, only 1% of these individuals died during the 1-year follow-up period.

#### Supplementary Information

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#### Author contributions

AC and AT had full access to all of the data in the study and take responsibility for the integrity thereof and the accuracy of its analysis. Concept and design: AC, FB and AT. Acquisition, analysis, or interpretation of data: all authors. Drafting of the manuscript: AC. Critical revision of the manuscript for important intellectual content: all authors. Statistical analysis: RP-A. Obtained funding: FB and AT. Administrative, technical, or material support: AC and AM. Supervision: AT.

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#### Availability data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author per reasonable request.

#### Declarations

#### Conflicts of interest

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