



SCIENTIFIC LETTER

A paediatric intensive care unit's experience in managing adult patients with COVID-19 disease[☆]



La experiencia de una unidad de cuidados intensivos pediátricos en el manejo de pacientes adultos con enfermedad COVID-19

To the editor:

The coronavirus disease 2019 (COVID-19) pandemic has critically overwhelmed the health systems of most affected countries. Since the beginning of the epidemic in China, there is evidence of a lesser impact of this illness in the paediatric population, both in terms of the number of affected patients and the severity of disease, with very few paediatric patients requiring admission to the intensive care unit.¹

Adult hospitals have had to adjust to the growing need for critical care beds, increasing their capacity very quickly and recruiting all available intensivists. Some strategies involved collaboration with paediatric services, including paediatric facilities and paediatric healthcare staff.^{2,3}

The aim of this paper is to report the experience in the management of adult COVID-19 patients by paediatric health care providers in a paediatric intensive care unit (PICU).

Our PICU is located in a maternity and children's hospital with a total of 324 beds. The PICU has 28 beds and manages approximately 1200 admissions per year.

Following the lead of other countries, the paediatric patients of 2 nearby hospitals were transferred to our unit, and paediatric critical care physicians and other paediatric healthcare staff from these 2 hospitals began to collaborate in the management of adult patients in their respective centres.

Aside from the admissions from other hospitals, we noticed a sharp decrease in the demand for paediatric care in our hospital due to the low number of children affected by COVID-19, the lockdown measures in Spain and the drastic

decrease in our usual hospital activity. Once we determined that our institution would be able to guarantee the capacity required to care for paediatric patients, an agreement was reached to start transferring adults with SARS-CoV-2 infection to our PICU.

Medical, nursing, and physical therapy protocols were developed for the treatment of adults with SARS-CoV-2 infection before the first admission and in adherence with adult intensive care guidelines. These protocols included, but were not limited to, the diagnosis and management of SARS-CoV-2 infection and acute respiratory and systemic inflammatory response syndrome and the prevention and treatment of thrombosis as specific critical aspects in the management of adult patients with COVID-19.⁴

In addition, our hospital held training simulations for specific concerns such as airway management, the use of videolaryngoscopy, prone-supine positioning manoeuvres, in-hospital transfer and the placement and removal of personal protective equipment (PPE).

Patients stayed in a physically separate 10-bed PICU dedicated exclusively to patients with confirmed SARS-CoV-2 infection in individual closed-off rooms equipped with automatic doors operated through contactless sensors. The unit did not require any adaptations for adult patient care, as it customarily admits patients up to age 18 years. The patients were managed by staff exclusively dedicated to their care. The care staff to patient ratios were the usual, with 1 doctor for every 5 patients and 1 nurse for every 1 or 2 patients, depending on the severity of the disease. Two types of zones were differentiated within the COVID-19 area based on the corresponding risk of infection: red high-risk zones that included every patient room, and intermediate-risk yellow zones that included the nurse's station and the corridors and facilities surrounding patient rooms. All staff members involved in the care of these patients were tested for SARS-CoV-2 by means of PCR on a regular basis.

Seventeen adult patients with SARS-CoV-2 were admitted between March 25 March and May 8. [Table 1](#) summarises the characteristics, treatment and outcomes of these patients. All patients were discharged either to our general hospital ward or to the general wards of the referring hospitals, and none of them died. No SARS-CoV-2 infections were detected in the health care staff. All involved parties considered the experience enriching and satisfactory.

Based on the available data and our own experience, PICUs can be adapted to provide quality care to adult

[☆] Please cite this article as: L. Hernández-Platero, A. Solé-Ribalta, M. Pons et al., La experiencia de una unidad de cuidados intensivos pediátricos en el manejo de pacientes adultos con enfermedad COVID-19, *Anales de Pediatría*. 2022;96:350–351.

Table 1 Characteristics, supportive care and outcomes of the patients. We express categorical variables as counts and percentages and non-normally distributed continuous variables as the median.

| Patients | |
|---|------------------------------------|
| Number of patients | 17 |
| Age (years) | 21–65 (31%) |
| Respiratory failure | 17 (100%) |
| Respiratory support and mean duration (hours) | |
| [●]MV | 13 (76.4%) 193 h |
| [●]NIV | 3 (17.6%) 46 h |
| Weaning strategy | |
| [●]NIV | 4 (23.5%) |
| [●]HFOT | 8 (47%) |
| [●]Ambient air | 1 (5.9%) |
| Most frequent comorbidities | Asthma Obesity High blood pressure |
| Outcomes | |
| [●]Mean PICU stay (days) | 9.8 |
| [●]Complications | Pulmonary embolism (1 patient) |
| [●]Death | 0 (0%) |

MV, mechanical ventilation HFOT, high-flow oxygen therapy; NIV, non-invasive ventilation; PICU, paediatric intensive care unit.

patients affected by COVID-19^{5,6} in case of patient overflow and as a part of its solution. These units have personnel trained in the management of critically ill patients and have experience treating severe respiratory illnesses.

Protocols to manage the spike in cases expected with the arrival of the cold season are already underway. The continuation of this collaboration will depend on how the seasonal epidemic of bronchiolitis associated with respiratory syncytial virus (RSV) that frequently overwhelms paediatric health care services unfolds this year.

Our experience in managing adults with COVID-19 can probably be extrapolated to other crisis situations in which there is no major paediatric involvement but there is a high demand for critical care beds. In such extreme situations,

PICUs can be part of a global strategy offer adequate care to critically ill adult patients along with adult hospitals.

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23 November 2020 6 January 2021

<https://doi.org/10.1016/j.anpede.2021.01.002>

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