

## ORIGINAL ARTICLE

# Patients with chronic conditions in the Emergency Department: what has the pandemic changed?

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### Abstract

The SARS-CoV-2 pandemic has led to a decline in Pediatric Emergency Department visits. Morbidity and mortality have increased in children with chronic conditions; however, the impact of the pandemic on emergency care for this population remains unclear.

To address this issue, we conducted a retrospective study at a tertiary hospital. Our findings indicated no significant changes in the proportion of patients with chronic conditions seeking emergency care or in the most common reasons for presenting to the Emergency Department during the confinement period.

### PACIENTES CON PATOLOGÍA CRÓNICA EN URGENCIAS: ¿QUÉ HA CAMBIADO LA PANDEMIA?

### Resumen

*La pandemia originada por el virus SARS-CoV-2 produjo una disminución de la asistencia a servicios de Urgencias en los pacientes pediátricos. Los pacientes pediátricos con patología crónica tienen una mayor morbimortalidad desconociendo hasta el momento el impacto de la pandemia en la asistencia a Urgencias de estos pacientes.*

*Realizamos, por tanto, un estudio retrospectivo en un hospital de tercer nivel en el que se objetivó que no hubo variación en la proporción de pacientes atendidos con este condicionante (padecer una enfermedad crónica), ni en el motivo de consulta más frecuente durante el período de confinamiento.*

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## INTRODUCTION

Pediatric patients with chronic conditions have increased morbidity, mortality, and functional limitations, associated with high healthcare resource use<sup>(1,2)</sup>. The SARS-CoV-2 pandemic in 2020 resulted in a decline in pediatric Emergency Department visits<sup>(3)</sup>; however, its impact on this specific patient group remains unclear.

Accessibility to the Emergency Department, the quality of primary care services, and caregivers' skills in home management are factors influencing PED use by these patients<sup>(4)</sup>. In the study conducted by Berry et al.<sup>(5)</sup>, it was observed that patients with chronic conditions who most frequently visit the Emergency Department include those with asthma, epilepsy, and sickle cell anemia. Furthermore, the authors point out that Emergency Department visit rates double or even triple in patients with multiple comorbidities, congenital heart disease, or those requiring a medical device, such as ostomies or ventriculoperitoneal shunts.

Previous studies have explored the most common reasons for Emergency Department visits among pediatric patients with chronic conditions, with respiratory diseases being the most frequent<sup>(6)</sup>. Edelson et al.<sup>(2)</sup> reported that having a comorbidity in addition to a chronic medical condition is an independent risk factor for both mortality and hospital admission. In addition, the study highlights that in patients with congenital heart disease, the presence of comorbidities increases the likelihood of presenting with an emergency condition, such as acute renal failure, sepsis, or neurological damage. This, in turn, adds to the complexity of managing these patients.

The return visit rate has recently drawn attention as it is an important indicator of patient safety and quality of care<sup>(2)</sup>. Analyzing the reasons for return visits in patients with chronic conditions is therefore a priority, aiming to reduce healthcare costs and enhance the quality of care provided. Previous studies have identified younger age as well as the association of comorbidities as risk factors for higher return visit rates<sup>(2)</sup>. However, no studies on this topic have been conducted in our setting.

In Pediatric Emergency Departments, the triage system plays a crucial role. The primary objective of triage systems is to identify patients requiring immediate care from those whose care can be safely deferred<sup>(7)</sup>. These systems include discriminators that determine the priority assigned to each patient, such as the presence of a "relevant condition for the current episode." Appropriate use of these discriminators improves the quality of care for patients with chronic conditions.

The aim of this study was to assess the impact of the SARS-CoV-2 pandemic confinement on visits to the Emergency Department of a tertiary hospital by patients with chronic conditions. Specifically, the study sought to analyze the proportion of emergency visits these patients represented before and during the confinement period, as well as to describe their reasons for visiting, triage priority, hospital admission rates, discharge outcomes, and return visit rates.

## METHODOLOGY

A retrospective, single-center cohort study was conducted in the Emergency Department of a tertiary-care hospital in

Madrid, Spain. The study included patients aged 1 to 16 years with chronic conditions who visited the pediatric Emergency Department during the study period. Chronic conditions were defined as underlying health issues that could affect the clinical presentation of the reason for visiting, as identified in the TRIPED<sup>®</sup> triage system using the discriminator "relevant condition for the current episode." Patients who were incorrectly assigned to the denominator—either due to the absence of an underlying condition or because their reason for visiting the Emergency Department was unrelated to their chronic condition—were excluded. This group of patients was analyzed in two periods: March-June 2019 (pre-COVID cohort) and March-June 2020 (during the confinement: COVID cohort). Demographic data and clinical features of the children who visited during both periods were collected.

Absolute frequencies and percentages were used to describe qualitative variables (demographic data, reason for visiting the Emergency Department, triage priority, need for diagnostic tests, hospital admission, and return visits), while medians with interquartile ranges (IQR) were used for quantitative variables (age, days to return visit). The Chi-square test was used to compare proportions. A statistical significance level of  $\alpha=0.05$  was set. Data analysis was performed using IBM SPSS Statistics 24. The study was approved by the Ethics Committee (CEIm) of our institution, and electronic medical records were reviewed for data collection.

## RESULTS

A total of 960 patients met the inclusion criteria: 705 in the pre-COVID cohort and 255 in the COVID cohort. Patients with chronic conditions accounted for 3.6% of pre-COVID visits and 4.2% of visits during the confinement ( $p=0.055$ ). No differences were observed in demographic characteristics between the cohorts, including mean age, sex, and type of relevant chronic condition (Table 1).

Fever was the most common reason for visiting the Emergency Department in both cohorts (14% in the pre-COVID cohort and 15.3% in the COVID cohort,  $p=0.347$ ), followed by respiratory difficulties in the pre-COVID cohort (10.2%) and vomiting (9%) in the COVID cohort. There was a decrease in the percentage of patients consulting for respiratory symptoms and an increase in those consulting for dysuria in the COVID cohort (Table 2).

No differences were found in the triage priority assigned to patients: level 1 (0.7% vs. 0.0%,  $p=0.333$ ); level 2 (10.8% vs. 8.6%,  $p=0.331$ ); level 3 (88.5% vs. 91.4%,  $p=0.206$ ). The rate of diagnostic tests performed during their stay in the Emergency Department was higher in the COVID cohort compared to the pre-COVID cohort (63.9% vs. 53.9%,  $p=0.003$ ); however, there were no differences in the proportion of patients requiring admission (19.3% vs. 23.1%,  $p=0.112$ ) or return visits (89 [12.6%] vs. 23 [9.0%],  $p=0.075$ ).

## DISCUSSION

This study examines the impact of the SARS-CoV-2 pandemic on patients with chronic diseases visiting the

**TABLE 1. General characteristics of the study cohorts.**

Variable	Pre COVID n= 705	COVID n= 255	p-value
Age at diagnosis (years)*	7.12 (4.9)	6.54 (5.2)	0.051
Sex: female	290 (41.1%)	113 (44.3%)	0.378
Relevant complex condition	332 (47.1%)	117 (45.9%)	0.740
Diagnostic tests	380 (53.9%)	163 (63.9%)	<b>0.006</b>
Requiring a medical device	88 (12.5%)	48 (18.8%)	<b>0.013</b>
Observation in the Emergency Department	292 (41.4%)	110 (43.1%)	0.634
Final diagnosis	N: 46 (6.5%) D: 63 (8.9%) R: 81 (11.5%) I: 265 (37.6%) O: 250 (35.5%)	N: 19 (7.5%) D: 42 (16.5%) R: 16 (6.3%) I: 70 (27.5%) O: 108 (42.4%)	<b>&lt; 0.001</b>
Days to return visit*	1.54 (1.3)	2.09 (1.8)	0.188

Data are expressed as absolute frequency and percentage. \*Data are expressed as mean and standard deviation. N: neurological; GI: gastrointestinal; R: respiratory; I: infectious; O: other.

**TABLE 2. Most common reasons for the Emergency Department visit in each cohort**

	Pre COVID n= 705	COVID n= 255	p-value
Fever	99 (14%)	39 (15.3%)	0.347
Respiratory difficulties	72 (10.2%)	15 (5.9%)	<b>0.023</b>
Cough	68 (9.6%)	10 (3.9%)	<b>0.002</b>
Vomiting	58 (8.2%)	23 (9%)	0.392
Abdominal pain	42 (6%)	18 (7.1%)	0.313
Dysuria	10 (1.4%)	10 (3.9%)	<b>0.020</b>

The results are expressed as absolute frequency and percentage.

Emergency Department. Patients with chronic conditions frequently present to pediatric Emergency Departments<sup>9</sup>. The findings showed no significant change in the proportion of patients with chronic conditions or in the most common reason for visits, fever. In other words, the decline in Emergency Department visits during the confinement period was similar for both these patients and the general population.

The decrease in pediatric patient care during the SARS-CoV-2 confinement period raised concerns about patients with chronic conditions, specifically regarding the potential delay in their visits to the Emergency Department, which could lead to delays in the diagnosis and treatment of serious conditions. Our results show that during the confinement period of the first wave of the SARS-CoV-2 pandemic, although patients with chronic conditions visited the Emergency Department less frequently, they did so in a proportion similar to that of the pre-pandemic period (3.6% vs. 4.2%,  $p=0.055$ ). Similar findings were reported in a study conducted in the United States by DeLaroche et al.<sup>(8)</sup>, which showed that although the overall number of children visiting the Emergency Department decreased, the proportion of patients with chronic conditions remained stable (23.7% in the pre-COVID cohort vs. 27.8% in the post-COVID cohort;  $p<0.001$ ).

In a study conducted in the United States by Hartnett et al.<sup>(9)</sup> to evaluate Emergency Department visits during the COVID-19 pandemic, it was observed that the number of patients presenting to Emergency Departments for reasons other than COVID-19 exposure or respiratory symptoms decreased significantly compared to the pre-pandemic period, particularly among patients younger than 14 years. The proportion of patients under 10 years of age seen in the Emergency Department in 2019 was 12%, compared to 6% during the pandemic period. Additionally, it was noted that pediatric patients visited the Emergency Department less frequently than adults seeking a diagnosis of SARS-CoV-2 infection.

Consistent with the findings presented above, the study by Dean et al.<sup>(10)</sup> reported a decrease in both the total number of visits and the incidence of critical illness in pediatric Emergency Departments during the pandemic.

Regarding the reasons for seeking care in the Emergency Department, we observed a decrease in visits for respiratory symptoms, such as cough and respiratory difficulties, with no significant differences in other complaints except for dysuria. Similar findings were reported in the previously mentioned study<sup>(8)</sup>, which demonstrated a 70% reduction in Emergency Department visits for respiratory disorders during the confinement period. The authors attributed this decrease to social distancing measures, which likely reduced viral transmission—a conclusion supported by the study conducted by Auger et al.<sup>(11)</sup>. At the same time, a decrease was observed for less serious reasons for visits, such as otitis media and upper respiratory tract infections, with reductions of 75.1% and 69.6%, respectively. However, the decline was less pronounced for other reasons for visits, such as mental health-related conditions (29%) and poisoning (33.1%).

On the other hand, no differences were observed in the need for high-priority care, as the proportions of level 2 and 3 cases were comparable between the two cohorts, as were the rates of admission and return visits, factors that have not been analyzed in other studies. It is likely that the confinement did not influence the decision to seek care but that

the overall reduction in illness accounted for the decrease in Emergency Department visits during this period. An increase in the number of diagnostic tests was noted in the confinement cohort, likely due to the routine performance of SARS-CoV-2 PCR testing.

The limitations of the study include its single-center and retrospective nature. Additionally, the specific types of diagnostic tests performed on each patient were not analyzed. It is also important to consider the context of Pediatric Emergency Departments during the confinement period, when urgent pediatric care was centralized in other hospital centers, with the exception of patients with chronic conditions, who were recommended to continue attending their referral centers.

### CONCLUSION

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During the period of confinement, the number of chronic patients visiting the Emergency Department decreased compared with the pre-pandemic period; however, this decrease was proportional to that observed in the rest of the pediatric population. Moreover, the reasons for their visits remained similar, and they did not require more priority care, hospital admissions, or frequent return visits.

### CONFLICT OF INTEREST

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The authors declare no conflicts of interest.

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