Anales de Pediatría 98 (2023) 228–231

analesdepediatría

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SCIENTIFIC LETTERS

Impact of the COVID-19 pandemic on pediatric invasive bacterial infections☆

Impacto de la pandemia de COVID-19 en las infecciones bacterianas invasivas en urgencias

Dear Editor:

During the SARS-CoV-2 pandemic, there was a decrease in the volume of visits to paediatric emergency departments (PEDs) at the international level.[1] The implementation of protective measures were associated with a decrease in the incidence of invasive bacterial infections (IBIs) transmitted through the respiratory route, such as those caused by *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae*.[2,3] Other IBIs (by *Escherichia coli* and *Streptococcus agalactiae*), more prevalent in younger children, did not exhibit this decrease.[3] To our knowledge, no studies in Spain have analysed these variations or whether the probability of a child managed in a PED receiving a diagnosis of IBI changed during the pandemic.

The main objective of our study was to assess the impact of the SARS-CoV-2 on the epidemiology of IBIs in the PED setting and the probability of a diagnosis of IBI in a previously healthy child aged less than 14 years visiting the PED.

Our PED keeps a register of all the IBIs diagnosed since 2008 that has been described in previous publications.[4] We defined IBI as the detection of a pathogenic bacteria in blood or cerebrospinal fluid, excluding patients in whom a bacterium customarily considered a contaminant was isolated in blood culture. In this study, we analysed cases of IBI diagnosed at the PED in previously healthy patients aged less than 14 years between 2017 and 2022. We compared the incidence and characteristics of IBIs in 2 periods: prepandemic (2017–2019) and pandemic (March 2020–December 2022). We divided the pandemic period based on the implemented protective measures (hygiene and social distancing measures) and PED access/volume visit: 2020 (more restrictive access, decreased volume of PED visits) and 2021–2022 (less restrictive access, higher volume of PED visits). The study was approved by the Research Ethics Committee of our hospital (file E22/36).

In the period under study, 269 105 episodes were documented in the PED (153 736 in the prepandemic period, with 4270 episodes/month, and 115 369 in the pandemic, with 3.93 episodes/month; change = −20.5%), and 119 (0.04%) previously healthy patients under 14 years received a diagnosis of IBI. Of the total IBIs, 70 were diagnosed in the prepandemic period and 49 during the pandemic. Within the latter period, the probability of a diagnosis of IBI in a previously healthy patient changed significantly: it was significantly higher in 2020. In 2021, with less restrictive access and a higher volume of PED visits, the number of IBI cases per month decreased compared to the prepandemic period, as did the probability of a diagnosis of IBI in a previously healthy patient. In 2022, overall, the epidemiology was similar to the epidemiology in the prepandemic period (Table 1).

During the pandemic, there was a marked change in the probability of a previously healthy patient receiving a diagnosis of IBI during a visit to the PED. When protective measures were most strict and the volume of visits to the PED lowest, the monthly incidence of IBI remained stable compared to previous years. However, this entailed a significant increase in the probability of diagnosis of IBI in a previously healthy patient visiting the PED, which decreased once again once protective measures were scaled down and access and visits to the PEDs increased. The decrease in the probability of diagnosis of IBI associated with the relaxation of protective measures was to be expected given the increase in viral infections, which became much more frequent. However, we cannot explain the decrease in the absolute frequency of patients with a diagnosis of IBI in the second year of the pandemic. We think that it is important for doctors who manage these patients to have this information, as it could be possible to incorrectly assume that since there is a decreased probability of transmission of IBIs through the respiratory route, the probability of a diagnosis of IBI in a child visiting the PED would be lower. In addition, changing trends in the incidence of IBI could also affect the yield of different clinical prediction rules or approaches used to identify patients with IBI. There is already evidence on the missed detection of infections bacteria transmitted via the respiratory route, such as *N. meningitidis*, when protective measures were stricter.[2,3] Last of all, in 2022 there was evidence of a significant resurgence of invasive pneumococcal infections, which ended up amounting to 40.9% of the total diagnosed cases of IBI.

Despite the limitations of our study, inherent to its single-centre design and the small sample size, we think that our findings underscore the need to design robust surveillance systems to monitor trends in IBI with the purpose of allowing the health care system and health professionals to be pre-

☆ Previous presentation: This study was presented at the XXVI Annual Meeting of Sociedad Española de Urgencias de Pediatría, held online, June 16–18, 2022.

Table 1 Total episodes of infection and episodes of invasive bacterial infection documented in the paediatric emergency department before and during the SARS-CoV-2 pandemic.

	Episodes in the PED	Episodes/month	IBIs	IBIs/month	IBI/episodes	Most prevalent bacteria (%)
Prepandemic	153 736	4270	70	1.94	1 IBI/2196	*S. pneumoniae* (18.6%) *N. meningitidis* (18.6%) *S. aureus* (17.1%) *E. coli* (15.7%) *S. agalactiae* (5.7%)
Pandemic						
2020	21 746	2175	19	1.90	1 IBI/1144*	*S. pneumoniae* (28.6%) *S. aureus* (20.4%) *N. meningitidis* (10%)
2021	39 880	3323	8	0.67*	1 IBI/4985*	*S. agalactiae* (10%)
2022	53 743	4478	22	1.83	1 IBI/2443	*E. coli* (10%)

IBI, invasive bacterial infection; PED, paediatric emergency department.
During the pandemic, the salient changes in the causative bacteria were the disappearance of *N. meningitidis* in 2021 and the increased frequency of *S. pneumoniae* in 2022 (9/22; 40.9% of total diagnosed IBIs).
In infants aged less than 3 months, *S. agalactiae* was the leading causative agent of IBI during the pandemic (33.3%) compared to *E. coli* (50%) in the prepandemic period.
* $P < .01$, compared to the prepandemic period.

pared for the potential emergence of a situation similar to the one experienced during the pandemic.

Funding

This research did not receive any external funding.

Conflicts of interest

The authors have no conflicts of interest to declare.

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https://doi.org/10.1016/j.anpede.2023.01.013
2341-2879/

Validity of CEEW equations for weight estimation in Spanish paediatric patients

Validez de las ecuaciones CEEW para la estimación de peso en pacientes pediátricos españoles

Dear Editor:

The calculation and manipulation of medication doses is not as frequent in any population as it is in the paediatric age group, so the management of paediatric emergency care episodes is a veritable challenge for health care providers. Knowing the exact weight of the paediatric patient is important, as dose calculations depend on this measure, but this information is not always readily available.

To solve this problem, various methods for weight estimation based on indirect measurements have been used historically, but practically all have limited validity due to the variation inherent in ethnic, biological and sociodemographic factors.[1,2]

Among the most recently developed weight estimation strategies are the Children's European Estimator of