



ORIGINAL ARTICLE

***Clostridium difficile* isolation in children hospitalized with diarrhoea** ☆,☆☆



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KEYWORDS

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Abstract

Introduction: *Clostridium difficile* is the leading cause of nosocomial and antibiotic-associated diarrhoea in adults, and its incidence has substantially risen over the last few years. The prevalence of this infection in children is difficult to assess due to the high rates of colonisation in this setting.

Materials and methods: A one-year retrospective study was conducted on children under 15 years admitted to hospital with acute diarrhoea. Epidemiological, clinical, laboratory findings and outcome of children with *Clostridium difficile* infection (CDI) were compared to other causes of diarrhoea. Risk factors for CDI were identified by multivariate analysis.

Results: Two hundred and fifty children with acute diarrhoea were identified. A microbiological pathogen was identified in 79 (45.4%) of 174 patients who underwent complete testing: 19 CDI (25.6%, 13 of which were enterotoxin-producing), 21 other bacteria (28.6%), and 34 viruses (45.8%; rotavirus $n=31$; adenovirus $n=3$). The estimated incidence of CDI was 3 cases/1000 admissions, with 68.4% of them occurring in children younger than 2 years. Overall, 15.8% were community-acquired. Compared to other causes of diarrhoea, CDI was associated with

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comorbidity ($P < .0001$), recent contact with the health-care system ($P < .0001$) or intensive care unit stay ($P = .003$) and exposure to antibiotics in the previous month ($P < .0001$). The clinical course of children with CDI was less symptomatic. There were no clinical differences between *Clostridium difficile* toxin-producers and non-toxin producers. Comorbidity was identified as the main risk factor associated with CDI (OR 40.02, 95% CI 6.84–232.32; $P < .0001$).

Conclusions: The isolation of *Clostridium difficile* is common in hospitalized children with diarrhoea in our setting. CDI is more frequent in children with comorbidity and recent contact with the health-care system, presenting a mostly oligosymptomatic clinical course. Further studies are needed to understand the epidemiology of this infection in paediatrics, especially the percentage of asymptomatic carriers.

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PALABRAS CLAVE

Clostridium difficile;
Gastroenteritis;
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Colonización;
Pediatría

Aislamiento de *Clostridium difficile* en niños hospitalizados con diarrea

Resumen

Introducción: *Clostridium difficile* es la principal causa de diarrea nosocomial en adultos, y su incidencia está aumentando en los últimos años. Es difícil determinar su impacto en niños debido a las altas tasas de colonización.

Material y métodos: Estudio retrospectivo en menores de 15 años ingresados con diarrea a lo largo de un año. Se estudiaron las características epidemiológicas, clínicas, analíticas y la evolución de los niños con infección por *Clostridium difficile* (ICD) en comparación con otros aislamientos. Los factores predictores de ICD fueron determinados mediante análisis multivariante.

Resultados: Se identificaron 250 niños con diarrea, realizándose estudio microbiológico completo en 174. En 79 (45,4%) se llegó al diagnóstico: 25,6% ICD ($n = 19$; 13 enterotoxigénicos); 28,6% otras bacterias ($n = 21$) y 45,8% virus ($n = 34$; rotavirus $n = 31$; adenovirus $n = 3$). Un 68,4% fueron menores de 2 años, y un 15,8% fueron adquiridos en la comunidad. En comparación con otras causas de diarrea, la ICD se asoció a comorbilidad ($p < 0,0001$), contacto reciente con el sistema sanitario ($p < 0,0001$), estancia en UCI ($p = 0,003$) y exposición reciente a antibióticos ($p < 0,0001$). Los pacientes con ICD cursaron de forma oligosintomática. No hubo diferencias clínicas entre las ICD productoras o no de toxina, siendo la comorbilidad el principal asociado con la ICD (OR 40,02; IC 95% 6,84–232,32; $p < 0,0001$).

Conclusiones: El aislamiento de *Clostridium difficile* es frecuente en niños hospitalizados con diarrea en nuestro medio. La ICD resultó más frecuente en niños pequeños con comorbilidad y contacto reciente con el sistema sanitario, presentado, en su mayoría, un curso clínico oligosintomático. Se necesitan más estudios para conocer la epidemiología de esta infección en niños.

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Introduction

Clostridium difficile (CD) is the main cause of nosocomial diarrhoea in adults, and is associated with significant morbidity and mortality and increased healthcare costs. Its significance in children has yet to be properly established due to the high rates of asymptomatic colonisation in infants and children less than 2 years of age, which may be as high as 70%.^{1,2} Although symptomatic infections in children usually involve a mild and self-limiting course of diarrhoea, some high-risk groups, such as patients with cancer or certain gastrointestinal diseases, may develop severe forms of pseudomembranous colitis.^{3,4}

In recent years, there has been a global increase in the prevalence, morbidity and mortality of infection by CD (CDI), partly due to the emergence of the hypervirulent strain BI/NAP1/027,⁵ of which the first case in the Spanish population was recently described.^{6,7} In the paediatric population, the epidemiology of CDI has also shifted in the past decade, with an increase in the number of both hospital- and community-acquired cases.⁸ However, there are no studies analysing its prevalence and determining factors in Spanish children. Thus, we designed a retrospective study of hospitalised patients in order to describe the epidemiology, clinical characteristics and outcome of children in whom CD is isolated, comparing them to those of children admitted for diarrhoea caused by other pathogens.

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