



ORIGINAL ARTICLE

## Appropriateness of antibiotic prescribing in paediatric patients in a hospital emergency department<sup>☆</sup>



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### KEYWORDS

Antibiotics;  
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### Abstract

**Introduction:** Antibiotics represent one of the most widely prescribed therapeutic agents in children. It has been estimated that 30–50% of antibiotic prescriptions for this population are inappropriate. In this scenario, analysis of prescription data provides an invaluable source of information as a basis for implementing strategies for improvement in this field.

**Objective:** To assess the appropriateness of antibiotic prescriptions in a paediatric population at an emergency department.

**Methods:** An observational, descriptive, and cross-sectional study was conducted on patients under 14 years who attended the emergency department during 2013. A random sample of 630 patients was selected (confidence level 99%, accuracy 5%). To assess the suitability of antibiotic prescriptions, the clinical practice was compared with an evidence-based guideline especially designed for this study.

**Results:** Antibiotics were prescribed to 16.5% patients ( $n = 104$ ). Antibiotic treatment was inappropriate in 51.9% patients ( $n = 54$ ). Unnecessary treatment was indicated in 40.7%, with wrong antibiotics chosen in 35.2%, and the posology was incorrect in 24.1% of them. The most frequent diseases with incorrectly prescribed antibiotics were: acute otitis media, episodes of wheezing, fever of unknown origin, acute pharyngo-tonsillitis, and community-acquired pneumonia.

**Conclusion:** Antibiotic prescribing seems to be inappropriate in up to half of the patients. These data reinforce the need to develop a paediatric antimicrobial stewardship programme to decrease the unnecessary use of antimicrobial agents.

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**PALABRAS CLAVE**

Antimicrobiano;  
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Adecuación;  
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## Adecuación de la prescripción de antimicrobianos en población pediátrica en un servicio de urgencias hospitalario

**Resumen**

**Introducción:** Los antimicrobianos son uno de los agentes terapéuticos más empleados en niños. Se estima que entre el 30 y el 50% de las prescripciones son inadecuadas. En este escenario, el análisis de la prescripción aporta información importante para la implementación de medidas de mejora en este campo.

**Objetivos:** Evaluar la adecuación de la prescripción de antimicrobianos en población pediátrica en un servicio de urgencias.

**Métodos:** Estudio observacional, descriptivo y transversal en población menor de 14 años atendida en las urgencias hospitalarias de un hospital comarcal durante el año 2013. Se seleccionó una muestra aleatoria de 630 pacientes (intervalo de confianza: 99%; error alfa: 5%). Se analizó el grado de adecuación del tratamiento antimicrobiano comparando nuestra práctica clínica con las recomendaciones de una guía de tratamiento antimicrobiano basada en la mejor evidencia disponible diseñada especialmente para este estudio.

**Resultados:** Se prescribió antimicrobiano al 16,5% de los pacientes (n=104). El tratamiento fue considerado inadecuado en el 51,9% de los pacientes (n=54). Se prescribió tratamiento innecesario en el 40,7%, la elección del antimicrobiano fue incorrecta en el 35,2% y la posología en el 24,1%. Las principales enfermedades en las que se produjo la prescripción inadecuada fueron: otitis media aguda, episodio de sibilancias, fiebre sin foco, faringoamigdalitis aguda y neumonía adquirida en la comunidad.

**Conclusión:** Hasta en la mitad de los pacientes la prescripción de antimicrobianos puede ser inadecuada. Estos resultados ponen de manifiesto la importancia de introducir un programa de optimización de antimicrobianos para reducir su uso innecesario.

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**Introduction**

Infectious diseases are one of the most frequent reasons for seeking emergency care in the paediatric population. It is estimated that 2 out of 3 children that visit the emergency department do so in relation to infectious diseases.<sup>1,2</sup> Antibiotic agents are among the most frequently prescribed drugs, and Spain is one of the countries in Europe with the highest rate of antibiotic consumption in the community (outside hospitals).<sup>3</sup> Previous studies in the paediatric population have found that antibiotic agents are prescribed in 12%–18% of paediatric emergency visits.<sup>4,5</sup>

There is a high percentage of inappropriate antibiotic prescription both in hospitals and in the community. It is estimated that prescription of these drugs may be inappropriate in up to 30%–50% of cases.<sup>6,7</sup> Acute paediatric disease is particularly conducive to inappropriate prescription of antibiotic agents. A high proportion of patients seek care for respiratory infections, and these diseases are the main reason for inappropriate use.<sup>8,9</sup> Other factors include high caseloads, diagnostic and aetiological uncertainty, difficulties in following up patients after discharge, and the low availability, in general, of rapid microbiological tests to determine whether the disease has a bacterial or a viral aetiology.<sup>10</sup> The high and inappropriate consumption of antibiotic agents results in increased antimicrobial resistance at both the population and the individual levels.<sup>11</sup>

Furthermore, it can give rise to drug-related adverse events, changes in the body's microbiota, sensitisation with potential for future allergy and an increased risk of asthma or obesity.<sup>12,13</sup>

The problems that result from the inappropriate use of antibiotics have been recognised by scientific, health care and policy-making institutions. This has led to the development of strategies such as antimicrobial stewardship programmes (ASPs), which aim at improving antibiotic prescription with the end of achieving better clinical outcomes, reducing the incidence of adverse events associated with inappropriate use, and increasing the cost-effectiveness of care.<sup>14,15</sup>

Given that a large proportion of antimicrobial treatments are inappropriate and therefore unnecessary, we believe that a thorough knowledge of the actual pattern of use in each care setting would be of great interest to understand the circumstances under which inappropriate prescription occurs as well as its causes, with the ultimate purpose of implementing quality improvement interventions to achieve appropriate antimicrobial prescription.<sup>16–18</sup>

The aim of this study was to assess whether antibiotics were used inappropriately in the paediatric population at the emergency department of our hospital and to identify the diseases associated with inappropriate use as well as the factor in which the use was inappropriate: indication for use, choice of drug, dose, interval between doses or duration of treatment. To our knowledge, this is the first study of these

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