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Antimicrobial stewardship programmes can be safe and efficacious in the NICU setting

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In the past decade, the prevalence of antimicrobial resistance has increased significantly worldwide, and particularly in gram-negative bacteria in Europe. The inappropriate use of antibiotics strongly promotes the emergence of drug-resistant microorganisms. Infections by multidrug-resistant bacteria carry a poorer prognosis, with an attributed mortality in Spanish hospitals that is twice that associated with bacteria susceptible to commonly used antibiotics.[1] Based on current evidence, between 30% and 50% of community- or hospital-based antibiotic prescriptions could be optimised in some way. We expect very few novelties in antibiotic development from the pharmaceutical industry in upcoming years, so it is crucial that we optimise the use of those that already exist.

Approximately 25% of all antibiotic prescriptions in Spain are for the paediatric population. This population has unique characteristics as regards antibiotic prescription, differentiating it from the adult population, in which antimicrobial stewardship (AS) programmes have been successfully established, even if challenges remain when it comes to assessing their achievements. Furthermore, the care of ill children in Spain usually involves early antibiotic treatment of a highly proactive nature, but with a less invasive approach to the identification of the aetiological agent than the one taken in adult patients. This results in a substantial proportion of empirical antibiotherapy, with overuse of broad-spectrum antibiotics. This problem is even more marked, if possible, in newborns under intensive care. Due to the very nonspecific clinical presentation of infection and the difficulty in obtaining samples for microbiological testing to reassess the need for antibiotherapy at 48 hours from initiation, empirical treatment of infection is up to nine times more prevalent than treatment of microbiologically-confirmed infections in neonatal intensive care units (NICUs).[2]

Guidelines for AS in the NICU setting have been developed only recently (2012), with a significant delay compared to other populations. In the clinical practice guideline on antimicrobial stewardship recently published (prior to the current article) by the Infectious Diseases Society of America,[3] the quality of the evidence for the recommendation of the implementation of antibiotic stewardship programmes in NICUs to reduce inappropriate antibiotic use or antibiotic resistance was graded as low as D (good practice recommendation). Thus, the studies that have addressed the need for AS in the NICU setting to date are few and have focused on very specific aspects of antimicrobial treatment.

The SCOUT study reviewed in this issue of *Evidencias en Pediatría*[4] is the first work that demonstrates that the implementation of a bundle of AS strategies in a NICU setting can be efficacious and safe. The documented 27% reduction in antibiotic use exceeded the 19% reported in a recent meta-analysis of hospital-based AS programmes that included 26 studies with pre- and post-intervention periods of similar characteristics.[5] Furthermore, the safety outcomes of the intervention carried out in the SCOUT study, which found a similar mortality in the pre- and post-intervention periods, may encourage other neonatal units to implement similar antimicrobial stewardship strategies. For the time being, the short duration of followup of this study (nine months) did not suffice for the authors to find a significant reduction in the prevalence of multidrug-resistant organism colonisation in their unit (1.4% pre-intervention versus 1.0% post-intervention; $P = .92$), one of the most important objectives pursued by AS programmes. We await the results of further studies to see whether this desirable outcome can be achieved in association with a reduction in antimicrobial use. Moreover, a longer duration of followup could reveal potential benefits in terms of a reduction in the incidence of adverse effects (necrotising enterocolitis, death).

For now, while we await further data, we can conclude that the SCOUT study has demonstrated that antibiotic stewardship programmes can be safely implemented in NICUs and contribute to the reduction of antibiotic use.

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