

## Cervical lymphadenitis antibiotic regimen in pediatrics, stewarded? ☆



### Tratamiento antibiótico de la linfadenitis cervical bacteriana en pediatría, ¿A-PROA-BAMOS?

Dear Editor:

Antibiotic resistance is one of the global public health priorities, as the World Health Organization predicts that multi-drug resistant infections will be the leading cause of death in 2050, surpassing cardiovascular disease and cancer.<sup>1,2</sup> One of the key measures established in the National Plan against Antibiotic Resistance of Spain (known as PRAN for the Spanish acronym)<sup>3</sup> and the European Union Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections is the development of antimicrobial stewardship programmes (ASPs) for both the community and hospital settings.<sup>4</sup> The launching of these programmes in Spain was approved by the autonomous communities in the meeting of the Autonomous Community Coordinating Committee of the PRAN held in the headquarters of the Agencia Española de Medicamentos y Productos Sanitarios (AEMPS, Spanish Agency of Medicines and Medical Devices) in 2015.<sup>3</sup>

It is known that antimicrobials are widely prescribed to children. Some studies have found that at least one antimicrobial is prescribed in approximately 20% of outpatient visits and 60% of hospital admissions. Although the evidence in support of ASPs to optimise the use of antibiotics in adult hospitals is overwhelming, there are fewer data on paediatric settings.<sup>5</sup>

To assess the adherence of antibiotic prescribing to clinical practice guidelines in Spain and identify improvement opportunities based on ASPs, we selected a common complaint, cervical lymphadenopathy (cervical lymph node enlargement), which in some cases requires hospital admission and inpatient treatment. The leading cause of acute cervical lymphadenopathy in children is infection by *Staphylococcus aureus* or *Streptococcus pyogenes* (80%).<sup>6</sup>

We conducted a retrospective descriptive study of all patients aged less than 18 years admitted to a tertiary care hospital in Madrid with a diagnosis of cervical lymphadenopathy between January 2017 and December 2020. We excluded patients with oncological or haematological disease, immunodeficiency or on chronic immunosuppressive therapy. The sample included 62 children with a median age of 1.85 years (interquartile range, 1.14–3.82) with a male-to-female ratio of 2:1.1. An evidence source was not identified in 43 cases (69.4%), while 19 (30.7%) were associated with some form of infection in the ear-nose-throat region, and 2 (3.2%) had an odontogenic origin. Eighty-five percent of patients presented with unilateral lymphadenopathy, and patients sought care a median of 3.4 days from onset (standard deviation,

2.5). Forty-nine children had received oral antibiotherapy before being admitted: amoxicillin-clavulanic acid in 38 cases (77.5%), penicillin/amoxicillin in 5 (10.20%) and cefadroxil in 5 (10.2%). During the stay, they all received intravenous antibiotherapy: amoxicillin-clavulanic acid in 47 cases (76.7%), cloxacillin in 7 (11.4%) and the remaining 12%, ceftriaxone, cloxacillin + cefotaxime or cefotaxime + clindamycin. A microbiological diagnosis was initiated in 80% of admissions through blood cultures and/or cultures of samples obtained by fine needle aspiration biopsy or surgical drainage, yielding positive results in 14 children, in 10 cases to *Staphylococcus aureus*, out of which 9 isolates were susceptible to methicillin. Based on the results of antimicrobial susceptibility testing, treatment was switched to an agent with a narrower spectrum in 3 patients (21.4%).

Amoxicillin-clavulanic acid, a broad-spectrum antibiotic, was the most frequently prescribed antimicrobial for lymphadenitis, even though the current evidence and clinical guidelines support the use of agents with a narrower spectrum, such as oral cefadroxil or intravenous cloxacillin (unless an odontogenic origin is suspected, in which case amoxicillin-clavulanic acid is recommended). In our study, as we have described, we found inappropriate prescribing due to selection of the wrong agent both in primary care (outpatient setting) and after hospital admission in 85% of cases. Therefore, clinicians prescribed antibiotherapy correctly in only 15% of the cases, using oral cefadroxil and intravenous cloxacillin (the appropriate agents except in the case of odontogenic lymphadenopathy). We were surprised by the high proportion of inappropriate prescribing.

While we recognise that rational use of antibiotics in ASPs is more challenging in the case of severe disease or instability, we do not think that the use of broad-spectrum antibiotics can be justified in the management of common diseases such as cervical lymphadenopathy. Another key aspect promoted by ASPs is the de-escalation of treatment based on the results of culture and antimicrobial susceptibility testing, selecting those agents with a narrower spectrum. It is surprising that only 3 children out of the 14 with a positive culture received targeted treatment once the results were available.

Taking into account all of the above, this work was an opportunity to critically assess our own performance and reflect on how to improve of antimicrobial prescribing in our hospital. It would be “rational” to conclude that we are not managing cervical lymphadenitis appropriately. We ought to highlight the need to improve antimicrobial selection for empirical antibiotherapy and the importance of systematic de-escalation of antimicrobial treatment based on the results of microbiological testing in both hospital and community settings.

### Conflicts of interest

The authors have no conflicts of interest to declare.

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## Non-invasive mechanical ventilation in Spanish neonatal units<sup>☆</sup>



### Encuesta nacional sobre el uso de ventilación mecánica no invasiva en las unidades neonatales españolas

Dear Editor,

Non-invasive mechanical ventilation (NIV) is used in neonatal units to decrease the use of invasive mechanical ventilation.<sup>1,2</sup> Our objective was to determine the frequency of use of NIV, its indications and the ventilators, parameters and modalities of ventilation used. Between April and May 2017, we sent an online questionnaire to the neonatal units in Spain that offer higher levels of care, and requested that a representative for the unit respond to the questions based on the actual practices of the unit as opposed to personal preference. We present a descriptive analysis of the data, expressing categorical data as absolute frequencies and percentages, and continuous data as median and interquartile range (IQR).

We contacted 67 units, and 44 participated (response rate of 66%). Ninety-six percent were level III units. Ninety-three percent used some form of NIV.

More than half of the units (56%) used NIV for initial respiratory support in the management of respiratory distress syndrome in preterm newborns delivered before 30 weeks' gestation. Twenty-nine percent used NIV for first-line respiratory support due to the high risk of failure of continuous positive airway pressure (CPAP) in these immature patients, and 27% used NIV or CPAP to initiate support depending on the clinical condition of the patient or the judgment of the

physician in charge. Sixty-two percent (24/39) used NIV during less invasive surfactant administration (LISA).

Table 1 presents the generators and interfaces used in the units, and Fig. 1 the ventilation parameters. Less than half of units in Spain (49%) had the capability to deliver synchronized NIV, and only 3 used this approach routinely

**Table 1** Generators and interfaces used for CPAP and NIV in neonatal units in Spain.

Generator	nCPAP, n (%)	NIV, n (%)
Bubble CPAP <sup>®</sup>	5/44 (11%)	-----
Hamilton Medical	8/44 (18%)	-----
Aladdine/Arabella <sup>®</sup>		
Medical Sorevan CPAP	7/44 (16%)	2/41 (5%)
medinCNO <sup>®</sup> /Medijet <sup>®</sup>		
Ginevri Medical	7/44 (16%)	7/41 (17%)
Technologies Giulia <sup>®</sup>		
Acutronic Fabian CPAP <sup>®</sup>	14/44 (32%)	11/41 (27%)
Adaptation of conventional respirator	25/44 (57%)	21/41 (51%)
Care Fusion Infant Flow <sup>®</sup>	28/44 (64%)	27/41 (66%)
Interfaces	nCPAP, n (%)	NIV, n (%)
Short binasal prongs	41/44 (93%)	41/41 (100%)
Nasal mask	41/44 (93%)	38/41 (93%)
Nasopharyngeal or mononasal tube	8/44 (18%)	7/41 (17%)
RAM cannula	6/44 (14%)	4/41 (10%)
Oronasal face mask	5/44 (11%)	4/41 (10%)
Helmet	3/44 (7%)	-----

The used CPAP and NIV generators varied between units, and the most frequently used was the Care Fusion Infant Flow<sup>®</sup> generator, followed by conventional ventilators used for invasive ventilation adapted for NIV. Furthermore, 80% of hospitals used different NIV generators in the same unit. The most frequently used interfaces for both NIV and CPAP were short binasal prongs and nasal masks.

CPAP, continuous positive airway pressure; nCPAP, nasal CPAP; NIV, non-invasive ventilation.

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