# Carbapenem-resistant Enterobacteriaceae colonization in a Neonatal Intensive Care Unit in Bogotá, Colombia: Characterization and clinical outcomes

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## Introduction:

Carbapenem-resistant entereobacterales (CRE) infection is a global public health problem, especially in vulnerable populations (1). Nowadays there are multiple guidelines for diagnostic and treatment of these infections in children (2,3). In children, and specially in newborns, there are few studies that explore the clinical outcomes among those colonized with CRE. The main purpose of this study is to identify the difference in clinical outcomes between CRE-colonized and CRE-non-colonized newborns.

## Methods:

Retrospective, observational, longitudinal, cohort study for the surveillance of CRE colonization in neonates admitted between 2018 and 2021 in the NICU of a pediatric hospital in Bogotá, Colombia.
We screened all newborns for rectal colonization of CRE. We used HB&L Carbapenemase Kit® (Alifax, Italy).
The CRE colonization (CRE-C) was defined as a rectal swab detection of Carbapenem Resistant Enterobacterales with or without signs of infection and non-colonized controls (CRE-NC) were selected with a randomized program, CRE-NC for 21 CRE-C in a 3:1 ratio

## Results:

We found 21 (4,5%) newborns CRE colonized and 63 CRE-NC were used as control group.
We found that 71,4% of CRE-C and 25% of CRE-NC used antimicrobials before admission (p value 0,0005), Furthermore, 19% in CRE-C and 1,6% CRE-NC reported previous use of carbapenems (p value 0,01). On the other hand, invasive devices and the use of central venous catheter before admission were reported in 52% of CRE-C and 17,5% of CRE-NC.
Relative risk for different outcomes of CRE rectal colonization in newborns are shown in table 1. Sepsis for CRE was not calculated because we didn't find cases of CRE sepsis in CRE-NC newborns

| | RR | CI |
|---|---|---|
| Sepsis | 1,68 | 1,09 - 2,58 |
| CRE sepsis | NC | |
| Antimicrobials | 1,45 | 1,04 - 2,03 |
| Carbapenems | 6,75 | 2,32 – 19,66 |
| CRE Empiric therapy | 4,50 | 1,4 – 14,4 |

## Conclusions:

We found several factors that have been previously reported in the literature as risk factors for CRE colonization. The use of antimicrobials prior to admission, especially the use of carbapenems and the presence of invasive devices, such as the use of a central venous catheter, were more frequent in CRE-C than in CRE-NC newborns.
We found that rectal colonization for CRE was associated with increased risk of sepsis and sepsis with sterile isolation of CRE.

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