

02480 | 02480 Emergence of Enterobacterales with co-expression of two

carbapenemases during COVID-19 pandemic in Argentina: KPC+NDM, NDM+OXA-48

and KPC+IMP

## 03. Bacterial susceptibility & resistance

3b. Resistance surveillance & epidemiology: Gram-negatives

Fernando Pasteran <sup>1</sup>, Paola Ceriana <sup>1</sup>, Celeste Lucero <sup>1</sup>, Diego Faccone <sup>1</sup>, Sonia Gomez <sup>1</sup>, Denise De Belder <sup>1</sup>, Belen Sanz <sup>1</sup>, Juan Manuel De Mendieta <sup>1</sup>, Florencia Martino <sup>1</sup>, Alejandra Corso <sup>1</sup>

*Servicio Antimicrobianos, INEI ANLIS "Dr. C. Malbrán" - Buenos Aires (Argentina)*

**Please add any third party affiliations (research group, study group etc.) for your abstract**

**here** Carbapenemase Dual-producers Group: Monje Renata (Hospital Britanico, CABA), Ana Togneri (Hospital Evita, Lanus, PBA), Maria Florencia Gil (Hospital Cuenca Alta, PBA), Soledad Zarate (Sanatorio Guemes, CABA), Flavia Amalfa (Hospital Piñero, CABA), Rosa Nuñez (Hospital Neuquen, Rio Negro), Laura Derdoy (Hospital Ramos Mejia, CABA), Florencia Castro (Instituto Argentino de Diagnostico y Tratamiento, CABA), Lucia Velasco (Sanatorio Santa Isabel, CABA), Laura Errecalde (Hospital Juan A. Fernandez, CABA), Miriam Mortarini (Hospital Muñiz, CABA), Maria Sol Hrehoraszcuk (Sanatorio Sagrado Corazon, CABA), Gabriela Cervantes (Hospital del Bicentenario, Esteban Echeverria, PBA).

**Background** Carbapenemase-producing Enterobacterales (CPE) become endemic in Argentina, with nationwide outbreaks due to KPC, NDM and OXA-48-like producers. Co-expression of different classes of carbapenemases in Enterobacterales was not reported in Argentina prior to the COVID-19 pandemic. Since May 2020, an increasing number of isolates with co-production of carbapenemases were submitted to the NRL. Objective: to describe the epidemiological characteristics of carbapenemase dual producers.

**Methods** From May to November 2020, 196 Enterobacterales isolates were submitted to the NRL for carbapenemase molecular characterization. Isolates were screened for carbapenemase and ESBL production by two multiplex PCR assays: KPC, NDM, VIM, IMP and OXA-48-like and CTX-M, PER and CMY. Susceptibility was assessed by disk diffusion and/or agar dilution (CLSI/EUCAST). Species identification was performed by MALDI-TOF. XbaI PFGE was performed for *K. pneumoniae*-KPN- with KPC+NDM.

**Results** A total of 52/196 (27%) isolates were identified as dual carbapenemase producers from 13 Hospitals: 31 KPC+NDM (30 KPN, 1 *C. freundii*, from 8 Hospitals), 19 NDM+OXA-163 (10 *S. marcescens*, 6 KPN, 2 *E. coli* and 1 *P. vulgaris*, from 3 Hospitals) and 2 KPC+IMP (KPN, from 2 Hospitals). Isolates were recovered from CABA (29 isolates) and 2 Provinces (22 from Buenos Aires and 1 from Neuquén). About 37/52 (71%) isolates were from 3 hospitals: 2 from CABA, contributing with 10 KPN with KPC+NDM each, and 1 from Buenos Aires with 17 isolates with NDM+OXA-163 (4 species). Strains were from: 19 blood/catheter, 13 urine, 9 respiratory tract, 7 screening, 2 bones, 2 other sites. Strains were resistant to cephalosporins, monobactams, carbapenems, gentamicin, ciprofloxacin and trimethoprim/sulfamethoxazole but remained susceptible to 11% amikacin, 51% colistin, 78% tigecycline, 86% fosfomicin and 100% aztreonam/avibactam. 16 strains harbor CTX-M and 2 CTX-M+CMY, almost all among KPN

KPC+NDM producers. PER was not detected. Multiples clonal types were observed among KPN KPC+NDM producers.

**Conclusions** During hospital stress caused by COVID-19, new carbapenemase combinations were detected. The emergence of double producers occurred in 3 cities with KPC+NDM being the most frequent carbapenemase combination. All dual-producers remained susceptible to aztreonam/avibactam. The emergence of double carbapenemase producers constitutes a challenge for both, detection in routine laboratories and selection of the optimal antimicrobial treatment.

**Keyword 1**

KPC

**Keyword 2**

NDM

**Keyword 3**

carbapenemase

Conflicts of interest