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Molecular epidemiology of KPC-producing Enterobacteriaceae (ETB) in Argentina: An update 2006-2012

Author Block S. Gomez, D. Faccone, M. Rapoport, L. Guerriero, P. Ceriana, A. Petroni, F. Pasteran, Argentinean Kpc-group, A. Corso.
INEI-ANLIS-MALBRAN, BA, Argentina.

Background:

Emergence of KPC in our country started in 2006 and the first outbreaks of *K. pneumoniae* (KPN) ST258 occurred in the Metropolitan Area of Buenos Aires (AMBA) since 2010. The aim of this work was to describe the progress of KPC-producing ETB in Argentina.

Methods:

From 2006 to April 2012, 401 ETB clinical isolates were referred to the NRL (INEI) (183 hospitals, 14 provinces) as suspicious of KPC-producers (imipenem zones ≤ 22 mm and synergism with boronic acid). KPC and ESBLs were confirmed by PCR. KPC alleles, genetic platforms and MLST were determined by sequencing in PFGE-representative types. Plasmid typing was performed by PCR based replicon typing (PBRT). Genetic relationship was evaluated by XbaI-PFGE.

Results:

All 401 isolates carried *bla*_{KPC} gene, 79 of them were *bla*_{KPC-2}. KPN: 152/318 were studied by PFGE (14 provinces, 127 hosp), 87% belonged to PFGE type K1/ST258/ *bla*_{KPC-2}, associated to Tn4401a, mostly from AMBA (97%). In the other KPN-PFGE types, *bla*_{KPC-2} was flanked by IS*Kpn8*- Δ *bla*_{TEM-1} and IS*Kpn6*-like (Variant 1a). PBRT of 62 selected isolates revealed that 77% of the strains harboured FIIIs plasmids. The ESBLs detected in KPN were *bla*_{PER-2} and *bla*_{CTX-M2}. *Enterobacter cloacae* (ECL): 26/42 were evaluated by PFGE. Eight clonal types were identified (6 provinces, 18 hosp) being E3 the dominant clone (18/26, 69%). 24/26 harbored *bla*_{KPC-2} in Variant 1a, and the other 2 were derived from pKP048. Multiple PBRT (A/C, FIIIs, N and N) were detected. The ESBLs detected were: *bla*_{PER-2}, *bla*_{CTX-M2} and *bla*_{CTX-M15}. Other species: 14 *E. coli*, 10 *C. freundii*, 10 *K. oxytoca* and 4 *S. marcescens* harbored *bla*_{KPC-2} in Variant 1a (8 provinces, 31 hosp).

Conclusions:

The spread of *bla*_{KPC} in Argentina continues to be clonal due to the dissemination of ST258/Tn4401a in the AMBA. In parallel, increasing number of provinces suffer the slow but constant spread of *bla*_{KPC-2} in diverse ETB species and platforms.