Epidemiological and Molecular Characterization of KPC-producing Enterobacteria from Argentina

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Abstract:

Background: Argentina is endemic to KPC carbapenemase since 2010, mainly due to ST258 of Klebsiella pneumoniae. However, KPC has spread to other species, mainly Enterobacter cloacae. Here, we report the characterization of 52 non-duplicate KPC-producing E. cloacae detected in Argentina.

Methods: KPCs were suspected in 77 out of 200 E. cloacae complex isolates received at the NRLAR between 2008 and 2014 due to imipenem ≤22, or ertapenem ≤21 or positive Blue Carba Test or positive synergy with phenyl boronic acid disc. Species were confirmed by MALDI-TOF. Antimicrobial susceptibility testing was done with broth microdilution (CLSI). Resistant genes, kpc allele and genetic environment were studied by PCR and sequencing. Clonal relatedness was evaluated by X-bal-PFGE

Results: kpc-2 was confirmed in 77 out of 200 E. cloacae complex isolates. 52 were confirmed as E. cloacae and included for further studies. The isolation site was urine (25%), rectal swab (15%), blood (13%), catheters (8%), abdominal drainage (6%), traqueal fluid (4%), and others (29%). Isolates came from 31 hospitals (htals.), 58% of the isolates were from one district (Capital Federal, 17 Htals). The isolate distribution/yr was: 1/2008; 1/2009; 12/2010; 11/2011; 7/2012; 5/2013; 15/2014. Non-susceptibility was 100% to meropenem and nalidixic acid, 98% to imipenem and ciprofloxacin, 67% minocycline, 65% tigecycline, 60% gentamicin, 17% amikacin and 17% colistin. ESBLs were confirmed in 17/52 (33%): 10 per, 7 ctx-m. The isolates were not genetically related. kpc-2 was located on different Tn3-derived transposon in all isolates except one where it was located on the Tn4401a transposon.

Conclusion: We report the occurrence of kpc-2-producing E. cloacae. The clonal diversity observed suggests that kpc-2 dissemination in E. cloacae is not due to a major clone as used to happened with the K. pneumoniae ST258.