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**Molecular Epidemiology of *Providencia* spp. Harboring NDM Carbapenemase in Argentina**

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**Background:** NDM-producing organism emerged in Argentina in 2013. Since then NDM spread was mainly due to *Providencia* spp (Prov) isolates. Between 2013-2015 the NRL confirmed 39 Prov: 23 *P. stuartii* (Pst) and 16 *P. rettgeri* (Pre) harboring NDM.

**Methods:** Isolates non-susceptible to carbapenems (CBP) and with a positive synergy test between CBP and EDTA discs, were suspicious of MBL production. Strains were identified using MALDI-TOF. NDM-1 was confirmed by PCR and DNA sequencing. Genetic relatedness was assessed by NotI-PFGE. Susceptibility was evaluated by disc diffusion and dilution methods (CLSI). Statistical analyses were performed with Statistics Pro.

**Results.** Pre was mainly from urine (14/16, 88%) unlike Pst (8/23, 35%) ( $p < 0.01$ ). CBP non-susceptibility: 100% imipenem and meropenem and 77% ertapenem (100% Pre vs. 61% Pst [ $p < 0.01$ ]). 4/14 (29%) hospitals (hosp) reported Pre or Pst during more than one calendar year. 10/39 (26%) isolates co-produced ESBLs (7 CTXM, 3 PER). Susceptibility only to amikacin was mostly linked to Pst (31% vs 6% [ $p < 0.01$ ]). By NotI-PFGE, 4 Pre and 5 Pst clonal types were defined. Each dominant clone included 8/16 (3 hosp) and 11/23 (5 hosp) isolates of Pre and Pst, respectively. 56% of Pre (clones A and B) were found at the same hosp. Pst clone A (5 hosp/4 cities) was associated with increased likelihood of severe infection (bloodstream [ $p < 0.01$ ]), to co-produce CTXM [ $p < 0.01$ ], or to display an extreme-resistant phenotype.

**Conclusions:** Two Pre clones were widely found in a single hosp, while a dominant Pst clone was found in several hosp. The spread of NDM-producing Provis of high concern due to the limited available therapeutic options.

	Year			Total (%)
	2013	2014	2015	2013-2015
<b><i>P. stuartii</i> (Pst)</b>				
No. of isolates		6	17	23
No. of hospitals / cities		4 / 4	7 / 6	9 / 6
No. and types (%) of ESBL coproduction		0	7 (CTXM)	7 (30%)
No. (%) of isolates susceptible to:				
>=3 drugs		6	6	12 (52%)
2 drugs		0	4	4 (17%)
1 drug		0	7	7 (31%)
NotI-PFGE clonal types (No. of isolates):		B (5); C (1)	A (11); B (2); C (2); D (1); E (1)	A (11)(48%); B (7)(30%); C (3)(13%); D (1)(4%); E (1)(4%)
<b><i>P. rettgeri</i> (Pre)</b>				
No. of isolates	3	8	5	16
No. of hospitals / cities	2 / 1	1 / 1	5 / 1	6 / 1
No. and types (%) of ESBL coproduction	2 (PER)	1 (PER)	0	3 (18%)
No. (%) of isolates susceptible to:				
>=3 drugs	2	6	3	11 (69%)
2 drugs	1	1	2	4 (25%)
1 drug	0	1	0	1 (6%)
NotI-PFGE clonal types (No. of isolates):	A (3)	A (3); B (5)	B (3); C (1); D (1)	A (6)(38%); B (8)(50%); C (1)(6%); D (1)(6%)