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O0193 Polyclonal NDM-producing *Proteus mirabilis* outbreak in a Tunisian intensive care unit

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Background: *Proteus mirabilis* is an uncommon nosocomial pathogen causing opportunistic infections. *P. mirabilis* survives well in natural environment and is increasingly implicated in nosocomial outbreaks worldwide. Here we describe an outbreak caused by a NDM-1-producing *P. mirabilis* strains involving 18 critically ill patients in a Tunisian intensive care unit (ICU) in 2017.

Materials/methods: Twenty multidrug-resistant *P. stuartii* clinical strains isolated in Habib Bourguiba Hospital were studied. Antibiotic susceptibility testing was performed by disk diffusion method according to the European Committee on Antimicrobial Susceptibility Testing. Molecular typing was performed by PFGE. Antibiotic resistance genes were detected by PCR and sequencing. Plasmid analysis included conjugation experiments and incompatibility replicon typing by PCR.

Results: 27 multidrug-resistant *P. mirabilis*, were isolated from bloodcultures (12), urine (10), pus (3) and endotracheal aspirates (2) of 18 patients hospitalized in the medical ICU of Habib Bourguiba hospital between January 2017 and December 2017. All isolates were resistant to all β-lactams and to all other classes of antimicrobial agents tested including all aminoglycosides, trimethoprim/sulfamethoxazole, chloramphenicol, tigecycline, colistin and fosfomycin except fluoroquinolones for 5 isolates (27%). All isolates were found to have the following resistance genes bla_{NDM-1}, bla_{CMY-4}, *qnrB*, *fosA* and *aac-6′-Ib*. PFGE demonstrated that isolates from all 18 patients belonged to two clonal types: clone A (13 isolates) and clone B (5 isolates). Clone A isolates carried bla_{NDM-1} on a conjugative IncA/C plasmid and clone B carried bla_{NDM-1} on an untyable plasmid with bla_{CMY-4}, *fosA* and *aac-6′-Ib*. As many infected patients were hospitalized during overlapping time periods, horizontal intra-ICU transmission was considered as the main route for the dissemination of the outbreak strain after the persistence of this strain in the hospital environment.

Conclusions: To our knowledge, this is the first report of a long-term outbreak due to multidrug resistant-*P. mirabilis* co-producing NDM-1, CMY-4, FosA, Aac-6′-Ib and QnrB. These strain may have persisted in the environment and caused opportunistic infections. Clear guidelines to control reservoirs in the hospitals are urgently needed as these multidrug resistant-*P. mirabilis* strains pose a major threat to patient safety.