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### A long-term multidrug-resistant *Providencia stuartii* outbreak in a Tunisian intensive care unit

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**Background:** *Providencia stuartii* survives well in natural environment and often causes opportunistic infections. Clinical isolates of *P. stuartii* are usually resistant to multiple antibiotics. Here we describe an outbreak caused by a multidrug resistant-*P. stuartii* strain involving 20 critically ill patients in a Tunisian intensive care unit (ICU) December 2013 and July 2016.

**Material/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 repetitive sequence-based PCR (repPCR). Antibiotic resistance genes were detected by PCR and sequencing. Plasmid analysis included conjugation experiments and incompatibility replicon typing by PCR.

**Results:** Twenty multidrug-resistant *P. stuartii*, showing identical susceptibility patterns, were isolated from endotracheal aspirates (13) and bloodcultures (2) of three patients hospitalized in the medical ICU of Habib Bourguiba hospital between December 2013 and July 2016. All isolates were resistant to all  $\beta$ -lactams except carbapenems and cefepime and to all other classes of antimicrobial agents tested including all aminoglycosides, fluoroquinolones, trimethoprim/sulfamethoxazole, chloramphenicol, tigecycline, colistin and fosfomycin. All isolates were found to have resistance genes (*bla*<sub>CMY-4</sub>, *qnrA6*, and *armA*) carried on a conjugative IncA/C plasmid. repPCR demonstrated that isolates from all 20 patients belonged to a single *P. stuartii* clonal type as they have shown similar repPCR patterns. 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 a multidrug resistant-*P. stuartii* co-producing CMY-2, ArmA, and QnrA6. This strain may have persisted in the environment and caused opportunistic infections. It, therefore, poses a major threat to patient safety. Clear guidelines to control reservoirs in the hospitals are urgently needed.