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Paper Poster Session V

Recent epidemiological data on carbapenem-resistant Enterobacteriaceae

Spread of a new KPC-producing species, *Citrobacter maimonidesii* sp. nov., in six patients from two medical centres in Israel

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Objectives: To describe the molecular and microbiological features of a new KPC-producing *Enterobacteriaceae* spp., *Citrobacter maimonidesii* sp. nov., that was identified in two centers in Israel.

Methods: Isolates were detected on surveillance rectal culture. Phenotypic characterization was performed using homemade tests, the API 20E kit and the BBL™ Crystal™ Enteric/Nonfermenter ID Kit. Molecular identification was done by sequence analysis of the *16SrRNA*, *rpoB* and the *tuf* genes in comparison with reference strains and novel species retrieved from the BIBI software and the NCBI database, respectively. Pairwise distances analyses and phylogenetic trees were performed using the MEGA6 software. Strain typing was performed using PFGE following *spe*I digestion.

Results: The novel species was detected in four patients in 2012 at the RAMBAM medical center (RMC) and in two patients in 2013 at the Shaare Zedek Medical Center (SZMC) in Israel. Both the VITEK®-2 and the VITEK®-MS MALDI-ToF systems (bioMerieux) were not able to identify the species. All isolates were tested positive by bla_{KPC}-PCR and were resistant to ertapenem, meropenem, ceftazidime, piperacillin-tazobactam and gentamicin; they were susceptible to ciprofloxacin and amikacin. Isolates were facultative anaerobes, glucose-fermenting, gram-negative rods that utilized citrate, produced NO_2 and were ONPG positive and VP, indole, oxidase, H_2S and DNase negative. The RMC isolates had 99.3% similarity in both the *16SrRNA* and the *rpoB* sequences with the SZMC isolates, indicating an identical species; the PFGE patterns of the isolates at each center were identical but were different from the other center. Sequences of various *Citrobacter* species were the most similar (96% of the *rpoB* sequences); combined with the biochemical tests, we decided to designate the new species as *Citrobacter maimonidesii* sp. nov. Of note, the new species had >99% similarities in the *16SrRNA*, *rpoB* and the *tuf* genes sequences with a novel bacteria that was isolated from a Leaf-Cutter Ant.

Conclusion: This study describes the discovery of a new *Citrobacter* species that produces the KPC carbapenemase and its independent spread in two medical centers in Israel. Although this species is unlikely to be pathogenic to human by itself, it may serve as important reservoir and vector of antibiotic resistance genes.