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Abstract (poster session)

Emergence of Escherichia coli sequence type 131 with KPC-2 carbapenemase in a Portuguese hospital

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KPC carbapenemases dissemination worldwide among Enterobacteriaceae isolates has been associated with outbreaks. The aim of this study was to evaluate the carbapenem resistance among Escherichia coli isolates from patients and characterize the clonal relationship between isolates.Methods: Three E. coli isolates were selected and characterized initially at the hospital, using an automated system and interpreted according to CLSI, between December 2011 and February 2012 in a tertiary care group of hospitals in Lisboa. Susceptibilities to antimicrobial agents were then retested by disk diffusion and Etest method and interpreted according to EUCAST. Genes encoding Beta-lactamases, including metallo-Beta-lactamases, ESBLs and plasmid-mediated AmpC enzymes were screened by inhibition agents (Cloxacillin, EDTA, boronic acid), confirmed by PCR using specific primers and sequencing. Replicon typing was used to define plasmid incompatibility group. The molecular characterization was performed by RAPD and Multilocus sequence typing (MLST). Results: The E. coli isolates showed resistant to ciprofloxacin, gentamicin, amoxicillin/clavulanic acid, cefoxitin, cefotaxime, ceftazidime, cefpime, ertapenem, imipenem, meropenem, doripenem and MICs ranging between 8-24mg/L to carbapenems. No synergic effect was observed with inhibition agents except for boronic acid which showed increases of inhibition zones for carbapenemos, related with KPC producing enzyme. No amplification with specific primers was obtained for bla CTX-M-type enzymes and after sequencing the KPC amplicon was identified the gene coding for the carbapenemase KPC-2. The blaKPC-2 gene is part of plasmid belonged to the IncF incompatibility group and amplification was observed only for ISKpn6 element, suggesting that the blaKPC-2 gene in E. coli was included in a different genetic environment like Tn4401. The isolates were clonally related by PCR typing and by MLST identified ST131. This clone is a pandemic clone associated predominantly with community-acquired infection and has been implicated in the international dissemination of CTX-M-15 enzyme. Conclusions: We report for the first time the identification of multidrug-resistant E. coli producing KPC-2 carbapenemase in Portugal. The occurrence of an isolate belonging to the pandemic E. coli ST 131 was reported only in France (2009) and Ireland (2010).The spread of carbapenemases into this clonal group is a cause of serious concern in public health.