R2475

Abstract (publication only)

First report of KPC beta-lactamase in Klebsiella pneumoniae isolate from Croatia

B. Bedenic*, A. Mazzariol, V. Plecko, Z. Bosnjak, D. Sijak, G. Cornaglia (Zagreb, HR; Verona, IT)

Objectives: The aim of the study was to characterize carbapenem resistance in K. pneumoniae from Zagreb, Croatia. Material and methods: In February 2011. a 78 old male patient was admitted to Clinical Hospital Center Zagreb with subdural haematoma. He was previously diagnosed with acute myeloblastic leukemia. After surgical removal of haematoma he developed purulent meningtis. K. pneumoniae with reduced susceptibility to carbapenems was isolated. The patient died from intracerebral bleeding in April 2011. The antimicrobial susceptibility to a wide range of antibiotics was determined by broth microdilution method in Mueller-Hinton broth and 96 well microtiter plates according to CLSI guidelines. A double-disk-synergy test was performed to detect ESBLs. Modified Hodge Test (MHT) was used to screen for production of carbapenemases. MBL E-test was used to screen for production of metallo-beta-lactamases. The transferability of meropenem resistance was determined by conjugation (broth mating method) employing E. coli A15R- strain resistant to rifampicin. Transconjugant was selected on the combined plates containing meropenem (1 mg/L) and rifampicin (128 mg/mL). The presence of genes encoding ESBLs (blaSHV, blaTEM, blaCTX-M), plasmid mediated ampC beta-lactamases and carbapenemases blaKPC, blaOXA-48, blaOXA-NDM, blaVIM and blaIMP was determined by PCR . Results: The isolate showed resistance or intermediate susceptibility to expanded-spectrum cephalosporins, beta-lactam combinations with inhibitors, carbapenems and gentamicin but remained susceptible only to ciprofloxacin and colistin. Modified Hodge test was consistent with the activity of carbapenemases. The MBL test for metallo-beta-lactamase was negative indicating the absence of metallo beta-lactamase. Imipenem resistance was not transferred to E. coli recipient strain by conjugation. PCR revealed the presence of blaKPC, blaTEM genes and blaSHV genes. Sequencing of blaKPC gene revealed the presence of KPC-2 beta-lactamase. Neither plasmid-mediated AmpC beta-lactamase nor OXA-48 beta-lactamase were found. The strain was found belong to ST37 clone by MLST. Conclusions: Infection control efforts limited the spread of KPC-producing clone of K. pneumoniae in our hospital so far. KPC-2 beta-lactamase with similar properties was previously reported from USA, United Kingdom, Israel and Greece. To our best knowledge, this is the first report of KPC beta-lactamase from Croatia.