

Characterization Phenotypic and Genotypic of Carbapenemases Producing Enterobacteria in Isolates from Bloodstream in University Hospital

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Resumo:

Hospital acquired bloodstream infections constitute a serious health problem and are associated to high morbidity and mortality which result in increasing healthcare costs. Enterobacteria are responsible for much of bacteremia, which is even more worrying due to the different mechanisms of resistance, mainly for the production of enzymes such as β -lactamase. Clinical isolates resistant to carbapenems are becoming increasingly frequent in the hospital. Thus, the aim of this study was to evaluate the presence of carbapenemases in clinical isolates of *Enterobacteriaceae* from blood cultures in the years 2013 and 2014. During period studied, 69 isolates from bloodstream were resistant to at least one carbapenem available (ertapenem, meropenem and imipenem) were performed confirmatory tests to detect carbapenemase. Were included in this study one isolated per patient. The isolates were subjected to Hodge modified test for detecting the presence of carbapenemases, phenylboronic acid (PBA) to the phenotypic detection of enzymes of class A and 100 mM EDTA to investigate the presence of metallo β -lactamase. The samples that showed positive phenotypic test were characterized genotypically by PCR technique using specific primers for *bla*_{KPC}, *bla*_{NDM}, *bla*_{OXA}, *bla*_{IMP} and *bla*_{VIM}. *Klebsiella pneumoniae* was the most common microorganism isolated with 36 (52,2%), followed by *Serratia* sp. 14 (20,3%), *Enterobacter* sp 8 (11,6%), *Providencia stuartii* 6 (8,7%), *K. oxytoca* 3 (4,3%) and others 2 (2,9%). 55 (80%) were positive for the modified Hodge test and none of the isolates were tested positive for the presence of metallo β -lactamase 100 mM EDTA. The presence of the gene was confirmed *bla*_{KPC} in 53 microorganisms (77%) and these all were also positive for the test phenylboronic acid. None of the isolates showed the NDM, OXA, IMP and VIM genes. KPC)-producing *Enterobacteriaceae* are an emerging antibiotic resistance threat with demonstrated epidemic potential in our hospital. The epidemiology and the main resistance mechanisms present in bacteremia is important for guidance in the empirical antimicrobial therapy, which can reduce death rates caused by this type of infection.

Keys Words: Carbapenemases, KPC, bloodstream infections