

Molecular mechanisms of carbapenem resistance among Enterobacteriaceae isolated at Teaching Hospital, Batticaloa

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Introduction

Family enterobacteriaceae include a group of Gram negative facultative anaerobes. Members of family enterobacteriaceae can develop resistance to β - lactam antibiotics including carbapenems. The present study was carried out to identify the presence of selected genetic determinants of carbapenem resistance and extended spectrum beta lactamases (ESBLs) in carbapenem non-susceptible enterobacteriaceae at Teaching Hospital, Batticaloa.

Methods

Isolates which were resistant or intermediate sensitive to any of the carbapenems using routine sensitivity testing were collected for a six-month period from 1st October 2015 to 30th March 2016, sub cultured on blood agar and MacConkey agar and, incubated at 37 °C for 18 – 24 hours in ambient air. Susceptibility testing was repeated using the disc diffusion method according to the CLSI guidelines. PCR amplification of *bla*_{TEM}, *bla*_{SHV} and *bla*_{CTX – M} as potential genetic determinants for ESBLs and *bla*_{OXA – 48}, *bla*_{KPC} and *bla*_{NDM} as genetic determinants for carbapenemases were performed.

Results

Total of 768 enterobacteriaceae were isolated during the study period and of these 5 were confirmed as resistant to the carbapenem (CRE) group. All the isolates were intermediate resistant or resistant to imipenem, meropenem, ertapenem, ceftazidime, cefotaxime, ciprofloxacin, levofloxacin and aztreonam. Four isolates carried at least one potential genetic determinant of ESBLs (*bla*_{CTX – M} in 3, *bla*_{TEM} in 3 and *bla*_{SHV} in 2 isolates). Four isolates were found to carry at least one of the genetic determinants of carbapenemases tested for (*bla*_{OXA – 48} in 3 and *bla*_{NDM} in 1).

Conclusions

Metallo beta lactamase producing CRE are present in the Eastern region.

Keywords: carbapenemases, enterobacteriaceae, Carbapenem resistance

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