Co-occurrence of Plasmid-mediated Quinolone Resistance and Carbapenemases in Klebsiella pneumoniae Isolates in Assiut, Egypt

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Abstract:

Background: Co-occurrence of carbapenem and fluoroquinolone resistance amongst K. pneumoniae strains created a problem in treating infections caused by these MDR organisms. Objectives: This study was carried out to evaluate the co-existence of carbapenemases and plasmid mediated quinolone resistance (PMQR) determinants in K. pneumoniae isolates in Egypt.

Methodology: Forty-three K. pneumoniae isolates were collected from patients admitted to various intensive care units at Assiut University Hospital. Genes encoding for carbapenemases and PMQR were detected by PCR and sequencing. To determine the horizontal transfer of the PMQR and/or carbapenemases positive plasmids, conjugation experiments were performed. Results: Carbapenemases were detected in 34/43 (79.1%) of K. pneumoniae isolates. The positive rates of blaKPC and blaNDM1 were (48.8%) and (74.4%), respectively. PMQR determinants were detected in 100% of K. pneumoniae isolates. The positive rates of qnrB, qnrS and aac(6’)-Ib-cr were (83.7 %), (81.4 %) and (23.3%), respectively. bla NDM1 positive K. pneumoniae positive isolates co-harbored qnr S, qnrB and aac(6’)-Ib-cr at rates of (87.5%), (81.3%) and (25%) respectively, while (90.5%), (85.7%) and (9.5%) of blaKPC positive isolates co-harbored qnrS, qnrB and aac(6’)-Ib-cr, respectively. qnrB and qnrS exhibited statistically significant association with blaKPC and blaNDM1 (p

Keywords:

K. pneumoniae, PMQR, Carbapenemases

Published In:

Egyptian Journal of Medical Microbiology , Vol. 26 - No. 4 , NULL