

2ND INTERNATIONAL CONFERENCE ON
APPLIED MICROBIOLOGY AND BENEFICIAL MICROBES
OCTOBER 23-25, 2017 OSAKA, JAPAN

Genetic context novel NDM-5 producing *E. coli* (ST405 and ST648) and *K. pneumoniae* (ST11 and ST147) clinically isolated from different hospitals, Pakistan

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Backgrounds: New Delhi Metallo- β -lactamase (NDM) is a carbapenamase, conferring resistance to all β -lactam antibiotics including carbapenems. They are mainly isolated *K. pneumoniae* and *E. coli* which lead to morbidity and mortality globally. NDM is endemic to the Indian subcontinent but has spread worldwide since its first description in 2009. Now there are many NDM types have been identified (NDM-1-NDM-18).

Methodology: A total of 300 clinical isolates of carbapenem resistant Gram-negative bacteria were collected from various source of specimens from different hospitals of Pakistan. Isolates were identified and confirmed by Vitek 2 system and MALDI-TOF. Molecular identification of *bla*_{NDM-5} was done by sequencing followed by PCR. MIC of *bla*_{NDM-5} producing bacteria was of performed using Vitek 2 System. Multi-locus sequence typing (MLST) of *E. coli* and *K. pneumoniae* was performed by amplifying the house keeping genes. Plasmid analysis was done by PFGE and DNA-DNA hybridization.

Results: Out of 300 clinical isolates, 4 *E. coli* and 4 *K. pneumoniae* were identified and confirmed for *bla*_{NDM-5} by two amino acids substitution at 88th position (Val-Leu) and 154th position (Met-Leu). MIC of the *bla*_{NDM-5} producing bacteria showed 100% resistance to all the β -lactam antibiotics including the carbapenem and moderate resistance to other class of antibiotics. MLST analysis revealed that *E. coli* isolates belongs to the sequence type (ST) of 405 and 648 however, *K. pneumoniae* belongs to the ST 11 and 147. These isolates contained different number and size of plasmids and most of them contained *bla*_{NDM} on ~50 kb and ~280 kb of plasmids.

Conclusion: This study first identified NDM variant in *E. coli* and *K. pneumoniae* of different ST. NDM-5 producing bacteria have high level of antibiotics resistance and carried *bla*_{NDM} on different size of plasmids.

Biography

Muhammad Usman Qamar has his expertise in molecular genetics and antimicrobial resistance of Gram-negative bacteria, particularly isolated from the pediatric patients in Pakistan from the last 10 years.

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