

Genomic detection of New Delhi Metallo β -lactamase gene-1 (NDM-1) from hospital environment

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Abstract

Hospital acquired infection represents a major problem in health care system. β -lactam class of antibiotics is commonly used for treating bacterial infections. The most common mode of resistance is through β -lactamase enzyme. New Delhi Metallo β -lactamase (NDM) is a class of β -lactamase enzyme causing resistance to β -lactam antibiotics. Previous study has reported the prevalence of NDM-1 gene in isolates from MDR-GNB (Multi drug resistant gram negative bacilli) isolates. The current study aims to understand the presence of NDM gene in hospital environment. We collected swab samples from high risk wards including De-addiction ward, neurology ward, neurosurgery ward, head injury ward, pediatric neurology ward, pediatric neurosurgery ward, psychiatry ward and short stay ward. DNA was extracted using Cetyl trimethylammonium bromide-Sodium chloride method for maximum DNA recovery. The conventional PCR was standardized with forward primer 5'-GGGCAGTCGCTTCCAACGGT-3' and Reverse primer 5'-GTAGTGCTCAGTGTCGGCAT-3'. Of a total of 70 samples tested, 34 were found to be positive for NDM gene (48.57% positivity). Neurosurgery ward did not yield any positive results. Pediatric neurology ward tested positive for all the samples. Though the study does not identify the source organism harboring the NDM gene, we have successfully identified key environmental areas which may serve as a source of spreading antibiotic resistance. By focusing on these key areas, it may be possible to reduce the spread of resistant bacterial infection.

Biography

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