Comparative Study of CDST & Multiplex PCR to Detect MBL Producing Gram-Negative Bacilli among VAP Patients Admitted in a Public Medical College Hospital of Bangladesh

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Abstract

Background: Ventilator-associated pneumonia (VAP) is the most common nosocomial infection in intensive care units (ICU), which accounts for 25% of all ICU infection. Documenting carbapenem-resistant gram-negative bacilli is very important as these strains may often cause outbreaks in the ICU setting and are responsible for the increased mortality and morbidity or limiting therapeutic options. The classical phenotypic method cannot provide an efficient means of diagnosis of the metallo-beta-lactamases (MBLs) producer. Polymerase chain reaction (PCR) assays have lessened the importance of the phenotypic approach by detecting metallo-beta-lactamase resistance genes such as New Delhi metallo-beta-lactamase (NDM), Imipenemase (IMP), Verona integron-encoded metallo-beta-lactamase (VIM), Sao Paulo metallo-beta-lactamase (SPM), Germany Imipenemase (GIM). Objective: To compare the results of the Combined Disc Synergy Test (CDST) with that of the multiplex PCR to detect MBL-producing gram-negative bacilli. Materials and Method: A total of 105 endotracheal aspirates (ETA) samples were collected from the ICU of a public school in Bangladesh. This cross-sectional study was carried out in the Department of Microbiology, Chittagong for quantitative culture, CDST test, and multiplex PCR for bla(IMP), bla(VIM), bla(NDM) genes of MBL producers. Results: Among the 105 clinically suspected VAP cases, the quantitative culture was positive in 95 (90%) and among 95 g-negative bacilli isolated from VAP patients, 46 (48.42%) were imipenem resistant, 30 (65.22%) were MBL producers by CDST, 21 (45.65%) were identified as MBL producers by multiplex PCR. Conclusion: PCR was highly sensitive and specific for the detection of MBL producers.

Keywords

Author Keywords: VAP; MBL; multiplex PCR; metallo-beta-lactamases; CDST test; bronchoalveolar lavage; BAL
KeyWords Plus: METALLO-BETA-LACTAMASE; VENTILATOR-ASSOCIATED PNEUMONIA; INTENSIVE-CARE-UNIT; RISK-FACTORS; BRONCHOALVEOLAR LAVAGE; QUANTITATIVE CULTURES; ENDOTRACHEAL ASPIRATE; EMERGENCE; DIAGNOSIS; RESISTANCE

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