

Comparative Evaluation of Biofilm Detection Methods among Uropathogenic Gram-Positive and Gram Negative Bacteria Isolated from Catheterized Urine Sample and its antibiogram

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Abstract

Background: Biofilm formation is a potential virulence characteristic exhibited by bacteria resulting in the severity of many infections. It will give rise to multidrug resistant strains disturbing the effective management of many chronic infections. **Objectives:** The present study aims to focus on the biofilm detection of uropathogenic bacteria by three distinct techniques. The sensitivity and specificity for all the three methods is evaluated. The present study also demonstrates the antibiogram of biofilm producing bacteria. **Materials and Method:** The study includes 89 bacterial isolates from catheterized patients with urinary tract infections admitted in ICUs, dialysis units and various wards. Formation of biofilm was detected by: tube method (TM), the tissue culture plate (TCP) method and Congo Red Agar (CRA) method. According to CLSI guidelines the antimicrobial susceptibility test was performed among the biofilm forming bacteria. **Results:** Out of 89 bacterial isolates, 33 were gram positive cocci and 56 were gram negative bacilli. Among the gram positive cocci, 28 (84.8%) and gram negative bacilli, 50 (89.2%) formed biofilm. Sensitivity of TCM, TM, and CRM methods were 98.3%, 71.4% and 18.6% respectively. For biofilm forming gram positive bacteria, the maximum antibiotic resistance was achieved towards Penicillin (89%) followed by Amoxyclav (78%). In the case of gram negative bacteria gentamicin showed maximum resistance in 88% followed by Ciprofloxacin in 80% of the isolates. **Conclusion:** Biofilm and multi-drug resistance plays a vital role in the pathogenesis of catheterized urinary tract infection (CAUTI). Evaluation of Biofilm among uropathogenic bacteria helps to manage clinically resulting in better prognosis. Tissue culture plate technique is very effective in detecting biofilm that can be suggested in diagnostic laboratories.

Keywords: Biofilm, virulence factor, multidrug resistance, CAUTI.