

Phenotypic and Genotypic Evaluation of Antibiotic Resistance of *Acinetobacter baumannii* Bacteria Isolated from Surgical Intensive Care Unit Patients in Pakistan

ABSTRACT

Background: Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is a significant nosocomial pathogen, causing serious threats concerning community-wide outbreaks globally, as well as in Pakistan. Antimicrobial resistance in *A. baumannii* is increasing day by day. Objectives: The study aimed to find out the antibiotic resistance (AMR) patterns and evaluate the AMR genes in clinical isolates from patients admitted to the surgical Intensive Care units (ICUs) at different hospitals in Lahore, Pakistan. Methods: A total of 593 clinical specimens were collected from patients admitted to the surgical ICUs of three different local hospitals in Lahore, Pakistan. From these samples, a total of 90 *A. baumannii* isolates were identified and further investigated to observe phenotypic resistance patterns and detect carbapenemases resistance genes. Results: The results showed that phenotypic resistance against amikacin was 27.2%, ceftriaxone 100%, ceftazidime 27.2%, cefepime 63.3%, ciprofloxacin and co-trimoxazole 100%, gentamicin 40%, imipenem 22.2%, meropenem 21.1%, piperacillin-tazobactam 27.2%, tigecycline 27.2%, and tetracycline 63.3%. All *A. baumannii* isolates were found to be sensitive to colistin (CT), polymixin-B (PB), and tobramycin (TOB). The PCR amplification of carbapenemases genes revealed the prevalence of blaOXA-23, blaOXA-51, and blaOXA-40 in 73, 90, and 64.4% of the isolates, respectively, along with blaNDM1 (92.2%), blaVIM (40%), blaIMP (90%), ISAba1 (85.5%), sul1 (16.6%), sul2 (20%), armA (32.2%), and PER-1 (12%) while the blaOXA-24 and blaOXA-58 genes were not detected in the isolates. The sequence analysis of the blaOXA-23 and blaOXA-51 genes showed 98% and 95% similarity with previously reported sequences in the GenBank database. Conclusions: The present study indicated that the emergence of high carbapenem resistance in CRAB isolates has increased, which may pose serious limitations in the choice of drugs for nosocomial infections.