

Differential Gene Expression Article of Efflux Pumps and Porins in Clinical Isolates of MDR *Acinetobacter baumannii*

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Abstract: Background: *Acinetobacter baumannii* is an opportunistic pathogen associated with healthcare infections and high mortality rates in intensive care units all over the globe. Porins and efflux pumps over-expression have been reported as contributing factors in escalating drug resistance and rendering treatment ineffective. In this study, we investigated the mechanisms of multidrug resistance (MDR) in *A. baumannii* clinical isolates. Methods: A total of 30 *A. baumannii* isolates were included in the present study from Nehru Hospital (PGIMER-Chandigarh) located in North India. Kirby Bauer disk diffusion assay and MIC were performed to determine the antimicrobial susceptibility pattern. Screening of beta-lactamases was performed using PCR. Relative gene expression of four RND, one MATE efflux pump, and two outer membrane proteins were determined using RT-PCR. Molecular typing of 22 isolates was carried out using MLST Oxford scheme. Results: CarO porin genes showed over-expression in 63% isolates followed by adeGandabeM efflux pump downregulation/underexpression (<0.5 fold), suggesting the carbapenem-susceptible phenotypic nature of the isolates. High prevalence of VIM-2, NDM-1, and OXA-23 genes was observed in *A. baumannii* isolates. Interestingly, NDM-1 and OXA-58 were traced in 10 and 3 *A. baumannii* isolates respectively; 13 of 22 (59%) isolates showed novel Sequence Types (STs) in the Multi-Locus Sequence Typing (MLST) analysis. ST 1087 was most commonly found ST among all others (16 STs). Conclusions: This study indicated a possible role of carO porin genes and adeG (RND) andabeM (MATE) efflux pumps in carbapenem susceptibility of *A. baumannii*. New STs were also reported in the majority of the isolates