

# HIGH PREVALENCE OF METALLO- $\beta$ -LACTAMASE CARBAPENEMASE-PRODUCING *ACINETOBACTER* *BAUMANNII* IN TRIPOLI, LIBYA: DOMINANCE OF OXA-23 AND NDM-1

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**Background:** *Acinetobacter baumannii* is an opportunistic pathogen causing various nosocomial infections. The aim of this study was to characterize the molecular support of carbapenem-resistant *A. baumannii* clinical isolates recovered from two Libyan hospitals.

**Methods:** Bacterial isolates were identified and antibiotic susceptibility test was performed using automated system. Carbapenem resistance determinants were studied phenotypically using three different techniques: metallo- $\beta$ -lactamase (MBL) E-test; chromogenic culture media and modified Hodge test (MHT). Polymerase chain reaction (PCR) amplification was used to determine the presence of metallo- $\beta$ -lactamase blaNDM-1, bla<sub>OXA23</sub>, bla<sub>OXA48</sub> and bla<sub>OXA51</sub> genes among isolates.

**Results:** A total of 108 *A. baumannii* isolates were characterized, overall the resistance prevalence was extremely high for aminoglycosides, fluoroquinolones, cephalosporins and carbapenems (93.2-100%), all isolates were susceptible to colistin. In addition, 97.5% of isolates were identified as multidrug resistance (MDR). Varying degree of phenotypic detection of carbapenemes was determined; highest levels of carbapenemes were detected using chromogenic media (75.5%) compared with MBL E-test (45.5%) and MHT (71.4%). The carbapeneme resistance-encoding genes detected were blaNDM1 (70.6%), bla<sup>OXA23</sup> (84%), bla<sup>OXA48</sup> (46.2%) and bla<sup>OXA51</sup> (73.1%); the highest carbapeneme genes were demonstrated in Burn and Plastic Surgery Hospital (73.7%). The co-occurrence of blaNDM1, bla<sup>OXA23</sup> and bla<sup>OXA48</sup> genes were demonstrated in (30/119; 25.2%) showing dissemination of carbapenemes resistance MDR *A. baumannii* in hospitals. MLST analysis for *A. baumannii* isolates revealed also the presence of multiple clones in our study. The clones belonging to ST1 and ST2 were the most frequent

**Conclusion:** This study shows that the high prevalence of NDM-1 and OXA-23 contribute to antibiotic resistance in Libyan hospitals and represents the high incidence of carbapenemases in an autochthonous MDR *A. baumannii* isolated from patients in Libya, indicating that there is a longstanding infection control problem in these hospitals.

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