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Title: Multidrug-Resistant Acinetobacter baumannii Harboring blaOXA-23 and blaOXA-51 Carbapenemase, in a Nemazee Hospital, Shiraz, Iran

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Abstract: Introduction: Carbapenems have potent activity against acinetobacters and, until recently, were often used to treat infections caused by multi-drug resistant A. baumannii isolates. In recent years, carbapenem resistance has been attributed increasingly to the production of carbapenemases, which may be class D carbapenem-hydrolysing oxacillinases. The aim of this study was to report the detection of blaOXA-51 and blaOXA-23 genes in multidrug-resistant clinical isolates of Acinetobacter baumannii from intensive care units (ICU) in Nemazee Hospital in Shiraz.

Material and methods: A total of 153 isolates, identified as A. baumannii using the API 20NE system, was collected during an 13-month investigation period in eight ICUs. Antimicrobial susceptibility testing of the isolated organisms was performed by the disk diffusion technique as well as the antibacterial effects of imipenem were evaluated by determination of its MIC by the microbroth dilution method according to the recommendations of the Clinical and Laboratory Standards Institute (CLSI). A multiplex-PCR targeting blaOXA-23-like, blaOXA-51-like genes was used to screen the isolates.

Results: Isolated were from sputum (27%), blood (10%), urine (42%), wound (7%), CSF (5.7%), eye discharge (3%), nasal (4.3%), BAL (1%). The representative isolates including bla OXA-51-like bla OXA-23-like isolates was 98.5% and 52.3% respectively. Antimicrobial agents tested were ampicillin–sulbactam (58%), piperacillin (98%), piperacillin–tazobactam (52%), cefotaxime (98%), amoxicillin (99%), colistin (6%), cefotaxime–clavulanicacid (98%), imipenem (48%), doxycycline (9%), kanamycin (98%), Tobramycin (38%), levofloxacin (48%) and Rifampin (96%).

Conclusion: The incidence and spread of multidrug-resistant A. baumannii nosocomial infections suggests the need for a surveillance program and enforcing adequate control measures in different hospital settings. The OXA-51-like subgroup may be intrinsic to A. baumannii, evidenced by its chromosomal location and its ubiquitous distribution among A. baumannii strains. Treatment for imipenem-resistant A. baumannii infection is sophisticated. Polymyxins (colistimethate and polymyxin B) and doxycycline may be the only remaining therapeutic option.

Key words: Acinetobacter, carbapenems, Multiplex-PCR, OXA blaOXA-23-like, blaOXA-51-like genes

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