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Molecular epidemiology and clonality of Acinetobacter spp in a Lebanese hospital over a period of one year

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Abstract

Introduction: The worldwide emergence of antimicrobial resistance in *Acinetobacter* spp and their clonal dissemination call for the investigation into *Acinetobacter* spp epidemiology.

Methodology: 100 nonrepetitive *Acinetobacter* spp isolates were recovered from patients admitted at Saint- George-Hospital-University-Medical-Center-Beirut, in a one-year period. Identification of the isolates was determined by the API20NE and confirmed by PCR amplification of $bla_{OXA-51-like}$. Susceptibility to carbapenems and colistin were determined by the microdilution method and interpreted according to the CLSI, 2015.The β lactamase inhibitors: PBA, EDTA, and Cloxacillin were used for the detection of KPC, MBL and AmpC, respectively. ESBL producers were detected whenever a keyhole effect was observed between 3rd generation cephalosporin and Augmentin®. Simplex PCR was conducted for the genotypic detection of β lactamases. ERIC and 3LST-PCR were performed to determine the clonality of the isolates.

Results: Our findings showed that 84% were carbapenem resistant. Only one isolate was resistant to colistin. Phenotypically, 23 were ESBL, 15 KPC, 5 AmpC, and 4 MBL producers. PCR analysis showed that 99%, 93%, 77% and 3 % of the isolates harbored $bla_{OXA-51-like}$, bla_{ADC}, $bla_{OXA-23-like}$, and $bla_{OXA-40-like}$, respectively. ERIC-PCR analysis showed that *A.baumannii* isolates were clustered in 19 possibly related and 30 closely related subtypes. The 3-LST-PCR showed that 86.2% of the *A.baumannii* isolates pertained to the ICII (international clone II).

Conclusion: Our study showed a predominance of OXA-23-like producers and dissemination of ICII. Inhibitor based method was shown not to be accurate for the prediction of carbapenemases in *Acinetobacter* spp. Infection control measures are needed for management of *Acinetobacter* spp infections.

Key words: *Acinetobacter* spp*;* β-lactamases; ICII.

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