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Increase of *bla*$_{\text{OXA-23-like}}$ in *Acinetobacter baumannii* at a tertiary care center in Lebanon between 2007 and 2013

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Abstract

Introduction: The multi-drug resistant nature of *Acinetobacter baumannii* isolates have rendered many broad-spectrum antimicrobial agents ineffective against them. The purpose of this retrospective study is to define and compare the molecular characteristics of *A. baumannii* isolates from patients at a tertiary care center in Lebanon from two outbreaks, the first in 2007-2008, as part of a case-controlled study involving *A. baumannii* cases admitted to the ICU, and the second in 2013.

Methodology: A total of 148 *A. baumannii* clinical isolates were collected from various clinical specimens during 2007-2008 and 2013. All *A. baumannii* isolates were screened for *bla*$_{\text{OXA-23-like}}$ and *bla*$_{\text{OXA-51-like}}$ genes of carbapenem resistance. Additionally, in an effort to assess the degree of the isolates' genomic relatedness, random amplification of polymorphic DNA (RAPD) was performed.

Results: There was an increase in the prevalence of *bla*$_{\text{OXA-23-like}}$ and *bla*$_{\text{OXA-51-like}}$ genes between the two time periods; however, only 22% isolate genomic relatedness was calculated between 2007-2008 and 2013. Taking 80% as a margin of compatibility, 31 distinct clusters containing 2 to 11 strains were observed when both time periods were analyzed.

Conclusion: The presence of numerous clusters accompanied by a predominant increase in the prevalence of *bla*$_{\text{OXA-23-like}}$ between 2007 and 2013 suggests a horizontal transmission of the gene within various strains of the species, contributing to the persistent increase in carbapenem resistance over the years. Therefore, infection control measures are required with compliance among all healthcare workers.

Key words: *A. baumannii*; OXA-23; RAPD.

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