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Comparison of virulence determinants among *Acinetobacter baumannii* Clinical isolates obtained from Spain and Lebanon

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Abstract

Introduction. *Acinetobacter baumannii* is a pathogen that is causing concern due to its high genetic elasticity, allowing it to show high rates of antibiotic resistance and to express a wide range of virulence determinants. Several studies are aimed towards targeting the virulence of *A. baumannii* as an adjunct to antibiotic therapy. In this study, we investigate the difference in virulence determinants between *A. baumannii* isolates obtained from Spain and Lebanon

Methodology. Fifty-nine *A. baumannii* isolates were collected from La Paz Hospital, Spain, and 90 from St. George Hospital, Lebanon. The isolates were identified using VITEK-2. Biofilm formation was detected by crystal violet staining, hemolysis by blood agars, motility by surface motility assays, siderophore production by CAS assays, and proteolytic activity by azoalbumin assays.

Results. The expression of virulence determinants was highly variable among the isolates. Among the Spanish isolates, 84.4% produced biofilms, 54.2% showed hemolysis, and 69.5% produced siderophores. Among the Lebanese isolates, 85.6% produced strong biofilms, 47.8% showed hemolysis, and 57.8% produced siderophores. Proteolytic activity for the Spanish isolates (26.6 ± 8.4 U/L) was slightly higher than that of the Lebanese isolates (17.7 ± 9.5 U/L). Very few Spanish isolates (3) showed surface motility, as opposed to the majority of the Lebanese isolates (80) that showed surface motility.

Conclusion. The genomic plasticity of *A. baumannii* is demonstrated by its ability to differentially express virulence determinants. This highlights the need to treat each isolate as a unique case when attempting to use anti-virulence agents to treat *A. baumannii* infections.

Key words: *Acinetobacter baumannii*; biofilms; siderophores; motility; proteolysis; hemolysis.

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