Prevalence of metallo-β-lactamases in Acinetobacter baumannii clinical isolates: a report from the BORIS project

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ABSTRACT

INTRODUCTION

Metallo-β-lactamases (MBLs) have been isolated from Acinetobacter baumannii since its initial characterization in the 1970s as a clinical isolate. MBLs are characterized by the presence of Type II β-lactamases that require the presence of metal cations, most commonly Zn²⁺, for activity. MBLs are characterized by their unique resistance pattern to all β-lactam antibiotics, most β-lactamase inhibitors, and carbapenems. MBLs have been characterized into five classes: VIM-like, IMP-like, SIM-1, SPM-1, and GIM-1. MBLs have been characterized into five classes: VIM-like, IMP-like, SIM-1, SPM-1, and GIM-1.

METHODS

A total of 354 isolates were selected for this study. All isolates were identified as A. baumannii using standard methods and confirmed as A. baumannii by MALDI-TOF mass spectrometry. All isolates were stored at -80°C in Padiglione broth (BD, Sparks, MD) before testing. All isolates were tested for the presence of MBLs using a broth microdilution assay. A 1:1 dilution of 100X Tris-EDTA (Sigma, St. Louis, MO) was prepared in dH₂O and 20 μM MgCl₂, 2 μg DNA was added to 20 μl of 1X LightCycler FastStart DNA Master SYBR Green I, and 0.1 mM of each primer was used. PCR reactions were run according the kit protocol, and 1 l of resulting product was analyzed using DiversiLab® kit for automated rep-PCR (Bacterial BarCodes, Inc., Athens, GA).

RESULTS

A total of 354 isolates were tested for the presence of MBLs. Using the DiversiLab® kit for automated rep-PCR, 18 distinct groups of MBL positive isolates were identified. These isolates were classified into 18 distinct groups. The dendrogram is representative of 18 MBL-positive isolates. These isolates were classified into 16 distinct groups. The dendrogram is representative of 18 MBL-positive isolates. These isolates were classified into 16 distinct groups.

DISCUSSION

MBLs are rare in North America (1). There are five classes of MBLs: VIM-like, IMP-like, SIM-1, SPM-1, and GIM-1. These isolates were classified into 18 distinct groups. The dendrogram is representative of 18 MBL-positive isolates. These isolates were classified into 16 distinct groups. The dendrogram is representative of 18 MBL-positive isolates. These isolates were classified into 16 distinct groups.

CONCLUSIONS

• MBLs are rare in North America (1).
• Screening for MBLs is recommended for detection of MBL-producing isolates.
• Genotypic testing is highly recommended for detection of MBL production.
• Genotypic testing should be performed on isolates showing high resistance to IPM in phenotypic tests (i.e. no zone of inhibition).