Polymerase KPC-3-Producing K. pneumoniae in the USA and Israel: Challenging Therapies and Molecular Typing Methods

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ABSTRACT

Background: KPC-encoding isolates are reported in the USA and Israel, limiting the clinical utility of β-lactams. Polymerase KPC-3-producing isolates were initially described in the USA and Israel. Conjugation was performed for these two isolates.

Methods: KPC-3-producing K. pneumonia isolates from USA and Israel were tested for β-lactamase production, susceptibility and clonal relatedness to other isolates. Conjugation products were analyzed for the presence of KPC-3.

Results: β-lactamase production and carbapenemases were detected in all isolates. Susceptibility to clindamycin was variable, but resistance to all other antimicrobials was consistent. Clonal relatedness was noted among the isolates from both countries.

Conclusions: The presence of KPC-3 in both countries indicates the potential for dissemination of this resistance gene.

INTRODUCTION

The gene encoding KPC-3 was initially discovered among K. pneumoniae isolates in New York City and Israel. Clonal relatedness of isolates from both countries was noted.

MATERIALS AND METHODS

Susceptibility and β-lactamase production

KPC-3-producing isolates from the USA and Israel were tested for β-lactamase production using the Etest (AB Biodisk, Solna, Sweden). MICs were determined for the following antimicrobials: ampicillin, tetracycline, ciprofloxacin, and gentamicin.

Conjugation

Conjugation products were analyzed for the presence of KPC-3 by PCR. Products obtained with both strains (Figure 3) were used to amplify the KPC-3 gene.

RESULTS

Three β-lactamase-producing K. pneumoniae isolates from Israel and one from New York, USA, were detected using the Etest.

Four isolates harbored the KPC-3 gene. The isolate from New York was resistant to almost all antimicrobial agents tested, being susceptible only to tigecycline. The isolate from Israel was susceptible to almost all antimicrobial agents tested, being susceptible only to tigecycline.

Phenotypic patterns for all isolates are shown in Figure 4. The isolates contained multiple plasmids with varying sizes.

SELECTED REFERENCES


