Antimicrobial Susceptibility of KPC-Producing Enterobacteriaceae Stratiﬁed by Infection Site (USA, 2012–2015)

M CASTANHEIRA, RE MENDES, RK FLAMM, HS SADER
JMI Laboratories, North Liberty, Iowa, USA

Abstract

Background: KPC-producing strains have been increasingly reported worldwide and these isolates are often resistant to all available antimicrobials. We evaluated the antimicrobial susceptibility of KPC-producing Enterobacteriaceae isolated from ICU patients in 11 US hospitals.

Methods: 465 KPC-producing Enterobacteriaceae clinical isolates were collected from 2012 to 2015 at the JMI Laboratories in the USA. These isolates were screened as part of the JMI Laboratories INFECTION Surveillance Program, and tested for susceptibility to reference antimicrobial compounds according to Clinical and Laboratory Standards Institute Approved Standard M100-S26. All isolates were tested for carbapenemase production and detection of two novel β-lactamases, namely KPC and MICE.

Results: Among 465 KPC-producing isolates collected from USA hospitals during 2012-2015, 15 (3.3%) were cultured from primary bloodstream infections (BSI), 17 (3.7%) from urinary tract infections (UTI), 71 (15.3%) from blood culture isolates, 33 (7.1%) from isolates from intra-abdominal infections (IAI) and 14 (3.0%) from other infection sites (Table 2). Overall, ceftazidime had no involvement in the collection, analysis, and interpretation of data.

Conclusions: The novel β-lactamase inhibitor combination ceftazidime-avibactam was the only agent tested against all KPC-producing isolates in the United States. The only other agent with ≥90% susceptibility was meropenem, which had no involvement in the collection, analysis, and interpretation of data.

Acknowledgments

Table 1. MIC distributions for carbapenem-resistant KPC-producing Enterobacteriaceae isolates collected from 2012 to 2015 in USA hospitals

Table 2. Susceptibility rates by infection site (USA, 2012-2015)

Table 3. Sequencing and gene expression data for three isolates from non BSIs (USA, 2012-2015)

Figure 1. Distribution of the infection types among 465 KPC-producing isolates collected from 2012 to 2015 in USA hospitals

Figure 2. Activity of ceftazidime-avibactam and comparator agents against 3 KPC-producing isolates collected from 2012 to 2015 in USA hospitals.

References


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