In vitro Activity of Plazomicin Against 110 Carbapenemase-producing Enterobacteriaceae Clinical Isolates

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Abstract

Background: Carbapenem-resistant Enterobacteriaceae (CRE) represent one of the most significant challenges to our current antimicrobial armamentarium. Our laboratory has been monitoring the presence of the CRE in central Indiana Health Care centers since 2009. These multi-drug resistant isolates with serum and renal metallo-carbapenemases are not susceptible to most beta-lactam antibiotics. In this study, we tested plazomicin, a new aminoglycoside, for its antibacterial activity against isolated CRE isolates in comparison to meropenem or other comparator agents.

Materials and Methods

Table 1: Summary of Susceptibility Data for Plazomicin and Comparator Agents Against CRE Isolates

Results

Table 2: MIC Distribution of Plazomicin and Comparative Antimicrobial Agents Against CRE Isolates

Figure 1: Cumulative Percentage of MICs of Plazomicin and Comparators Against CRE Isolates

Figure 2: Susceptibility Profiles for Comparative Agents (N=110 CRE)

Introduction

Plazomicin is a new aminoglycoside that is being developed by Achagen with an intent to treat serious bacterial infections such as complicated urinary tract infections and acute pyelonephritis.1 Plazomicin inhibits bacterial protein synthesis and possesses dose-dependent bacterial activity.2 It has activity against both Gram-positive and Gram-negative bacteria that harbor aminoglycoside-modifying enzymes.

Carbapenem-resistant Enterobacteriaceae (CRE) are associated with high mortality and morbidity. Our laboratory has been monitoring the epidemiology and carbapenemase production of CRE from central Indiana healthcare centers since 2009. These isolates produced mainly KPC serine carbapenemases, with co-production of VIM-1 (n=77) and NDM-1 (n=1) in eight isolates.2 4 For the following study, we selected 110 CRE isolates with varied phenotypes and tested them against plazomicin and appropriate comparator agents.

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