Introduction

Omadacycline is a tetrahydroxyridine analog of minocycline, with antistaphylococcal activity. The in vitro activity and pharmacokinetics of omadacycline have been demonstrated in phase II/III clinical trials. This study was conducted to determine the in vitro activity of omadacycline against a broad spectrum of Gram-positive and Gram-negative bacteria in a global surveillance program. Bacterial isolates were collected from various geographical locations and sources, and susceptibility testing was performed using standardized methods.

Methods

Bacterial strains and tested drugs: A total of 5,102 isolates were collected from 107 medical centers representing all 50 US states during 2015. A total of 61,591 bacterial isolates were tested for susceptibility to omadacycline, along with comparator agents.

Bacterial identification: The submitting laboratories identified the bacterial species, and the isolates were confirmed by external laboratories. Bacterial species were identified by the submitting laboratories and confirmed by the external laboratories.

Susceptibility testing: The MICs of all isolates were determined by the agar dilution method using Mueller-Hinton agar (Becton, Dickinson and Company, Sparks, MD) with 5% sheep blood (Becton, Dickinson and Company) in a 96-well microplate format. The breakpoints were determined using standardized methods (CLSI M100-S26; 2016). The MIC was defined as the lowest concentration of the antibiotic that resulted in a zone of inhibition of ≤0.5 µg/ml.

Results

Overall, 62.8% of isolates were inhibited at ≤0.5 µg/ml (omadacycline), and tetracycline was the most active drug against Gram-positive bacteria with 99.5% susceptible isolates. Against enterococci, omadacycline was active against 100.0% of the isolates. Against S. aureus, omadacycline was active against 99.0% of the isolates, and tetracycline was the most active drug with 100.0% susceptibility.

Conclusions

Omadacycline (MIC90, 0.03-0.12 µg/ml) showed high activity against Gram-positive bacteria and was active against more than 99% of S. aureus, S. pyogenes, Enterococcus, and Enterococcus faecalis isolates. It was also active against penicillin-resistant S. pneumoniae and methicillin-resistant S. aureus isolates.

References


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