In Vivo Activity of Omadacycline against 7,000 Bacterial Pathogens from the United States Stratified by Infection Type (2019)

**RESULTS**

- Omadacycline demonstrated potent in vivo activity against S. aureus isolates from SSIs (MIC90 ≤ 0.12 mg/L) and VRE (MIC90 ≤ 0.5 mg/L) (Tables 1-4).
- Omadacycline was active against staphylococci, including penicillin-resistant, macrolide-resistant, and -resistant strains (Table 1).
- Omadacycline was highly active against S. pneumoniae from SSSI and UTI (including ABSSSI and CABP).
- Omadacycline was highly active against Streptococci a (2.2%), Enterococci spp. (2.6%), and Enterobacteriaceae (2.6%) (Tables 1-3).
- All vancomycin-susceptible and -resistant E. faecalis isolates from SSSI were susceptible to omadacycline, as were 90.4% of E. faecalis species complex and 89.7% of Enterococcus faecium (Table 2).
- The results of this surveillance study support the continued use of omadacycline empirically in infants and children, given that these patient populations are key to the emergence of omadacycline resistance, including VRE and CA-MRSA.

**CONCLUSIONS**

- Omadacycline demonstrated potent in vivo activity against Gram-positive and -negative bacteria that represent key threats to the treatment of infection, including omadacycline-resistant Enterobacterales.
- Omadacycline had potent activity against S. aureus, Enterococcus faecalis, and -resistant E. faecalis from SSSI and UTI (including ABSSSI and CABP) from multiple infection sites and S. pneumoniae from SSSI.
- Omadacycline was highly active against S. pneumoniae isolates from Pneumonia In Hospitalized Patients (MPA) (Tables 1-3).
- The MIC90/90 for omadacycline and tetracycline comparators against key Gram-positive and -negative target pathogens is 0.06/0.12 mg/L for MSSA, 0.5/1-2 mg/L for S. pneumoniae, and ≤0.06/≤0.06 mg/L for other pathogens (Tables 1-3).
- All Enterococcus spp. isolates from SSSI and UTI were inhibited by ≤2 µg/mL of omadacycline (Tables 1-3).
- Omadacycline was active against Enterococcus faecalis and -resistant E. faecalis isolates from SSSI and UTI (including ABSSSI and CABP) (Tables 1-3).
- Omadacycline was active against non-fermenters, and 2,740 isolates from SSSI with MIC50/90 values of ≤0.06 ≤0.06 mg/L were inhibited by ≤4 µg/mL of omadacycline (Tables 1, 3, and 4).

**ACKNOWLEDGEMENTS**

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**REFERENCES**


**MATERIALS AND METHODS**

- A total of 7,000 bacterial isolates were recovered from patients with documented infection from the 2019 SENTRY Antimicrobial Surveillance Program (Medical University of South Carolina, Charleston, SC, and SENTRY Antimicrobial Surveillance Program, Pubic Health Laboratory, San Antonio, TX) (Tables 1-4 and Figure 2).
- 122 Metronidazole-resistant, 811 non-fermenters, and 92 Enterobacterales.
- Isolates were selected from patients with active infection and skin and soft tissue infections only from January to August 2019 (Tables 1-4).
- Organisms were phenotyped and included in this analysis for 7,000 isolates (Table 1).
- Clinical and Laboratory Standards Institute (CLSI) standards were used to interpret MIC results, with breakpoints for omadacycline, tetracycline, tigecycline, and doxycycline as described in Tables 1 and 2.
- All isolates were tested using Clinical and Laboratory Standards Institute (CLSI) methodology (2019). The Clinical and Laboratory Standards Institute (CLSI) is an independent, not-for-profit organization that establishes consensus-based standards for appropriate and accurate testing.

**RESULTS**

- Organism identifications were performed at participating medical sites and results were interpreted using CLSI and EUCAST. In the current study, all isolates from SENTRY Antimicrobial Surveillance Program were correctly identified at each participating medical site.
- Only 1 isolate per patient infection episode was tested.
- The susceptibility of MSSA isolates to the infection type is presented.

**TABLE 1: Antimicrobial activity of omadacycline and tetracycline comparators against bacterial isolates collected from patients with in vivo skin or skin structure infections (SSSI) in United States medical centers during 2019 (MSSA)*

<table>
<thead>
<tr>
<th>Organism (no. tested)</th>
<th>Omadacycline (MIC90/90)</th>
<th>Tetracycline (MIC90/90)</th>
<th>Tigecycline (MIC90/90)</th>
<th>Doxycycline (MIC90/90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>0.06/0.12</td>
<td>0.5/1-2</td>
<td>0.12/0.25</td>
<td>0.5/1-2</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>0.06/0.12</td>
<td>0.5/1-2</td>
<td>0.12/0.25</td>
<td>0.5/1-2</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>0.06/0.12</td>
<td>0.5/1-2</td>
<td>0.12/0.25</td>
<td>0.5/1-2</td>
</tr>
</tbody>
</table>

*Contains clinical and laboratory standards institute (CLSI) breakpoints for omadacycline, tetracycline, tigecycline, and doxycycline.