**Introduction**

Levofloxacin is very efficacious against a broad range of aerobic gram-negative organisms, including those with reduced susceptibility to beta-lactams and aminoglycosides. In vitro activity of levofloxacin, levonadifloxacin, and comparator agents was tested against 1,345 non-duplicate, non-MRSA isolates collected in the USA and Europe from several institutions located in four continents (United States [69 centers], Europe [61 centers], Asia [13 centers], and Australia [6 centers]). Isolates were collected as part of the SENTRY Antimicrobial Surveillance Program (ASP) from 1999 to 2004. This study evaluated isolates from respiratory infections (57.6%), blood (34.2%), urine (11.5%), and unknown (1.5%) and were of the following species: Haemophilus influenzae (65.6%), P. aeruginosa (14.9%), Enterobacteriaceae (7.8%), Streptococcus spp. (6.4%), Enterococcus spp. (3.4%), and Staphylococcus spp. (2.2%).

**Methods**

Susceptibility testing. MIC values were determined using Clinical and Laboratory Standards Institute (CLSI) methods and were performed as described in CLSI document M31-A3 (2015). Primary MICs from MIC panels were analyzed for consistency. Susceptibility tests were performed using the Etest (AB Biodisk, Solna, Sweden) and were read after 18 to 24 hours of incubation at 35°C using the CLSI disk diffusion methodology. Ciprofloxacin-resistant S. aureus isolates (MIC, 50 µg/mL) were determined using a CLSI agar dilution method and were read after 48 hours of incubation at 35°C. For MRSA, susceptibility was determined using a CLSI broth microdilution method and was read after 48 hours of incubation at 35°C. The MIC values for comparator agents were obtained from the SENTRY ASP and are on file.

**Results**

**Activity against Gram-positive organisms.**

Levofloxacin demonstrated greater overall activity (MIC < 4 µg/mL) against 95.9% of MRSA isolates and 82.2% of CA-MRSA isolates (MIC, ≤0.06/0.03 µg/mL) when compared to non-MRSA and non-MRSA MRCoNS isolates (11.6% and 25.0%, respectively) and CA-MRSA isolates (11.6% and 25.0%, respectively).

Levofloxacin demonstrated greater overall activity (MIC < 1 µg/mL) against 91.5% of MRSA isolates and 79.9% of CA-MRSA isolates (MIC, ≤0.06/0.03 µg/mL) when compared to non-MRSA and non-MRSA MRCoNS isolates (11.6% and 25.0%, respectively) and CA-MRSA isolates (11.6% and 25.0%, respectively). Levofloxacin treatment was non-inferior to comparator agent treatment against all MRSA/CA-MRSA isolates. Levofloxacin was at least twofold less potent than levofloxacin against non-MRSA and non-MRSA MRCoNS isolates (MIC, ≥1 µg/mL), except that levofloxacin was at least 8-fold more potent than comparators against CA-MRSA (MIC, >8 µg/mL).

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Table 1. Activity of levofloxacin and comparator antimicrobial agents when tested against selected Gram-positive isolates.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Comparator</th>
<th>Levofloxacin</th>
<th>Tigecycline</th>
<th>Vancomycin</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA</td>
<td>Ceftriaxone</td>
<td>≤0.06/0.03</td>
<td>&gt;8</td>
<td>≤0.06/0.03</td>
</tr>
<tr>
<td>CA-MRSA</td>
<td>Tetracycline</td>
<td>≤0.06/0.03</td>
<td>&gt;8</td>
<td>≤0.06/0.03</td>
</tr>
<tr>
<td>MRSA</td>
<td>Piperacillin</td>
<td>≤0.06/0.03</td>
<td>&gt;8</td>
<td>≤0.06/0.03</td>
</tr>
<tr>
<td>CA-MRSA</td>
<td>四氨甲砜青霉素</td>
<td>≤0.06/0.03</td>
<td>&gt;8</td>
<td>≤0.06/0.03</td>
</tr>
</tbody>
</table>

**Conclusion**

Levofloxacin, in combination with antistaphylococcal agents, demonstrated activity against a large worldwide collection of Gram-positive and -negative bacteria.

**Acknowledgements**

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