Ceftaroline Activity Against Clinical Isolates of *Staphylococcus aureus*, Including Methylisillin-resistant Strains (MRSA), from United States Hospitals

H.S. SADER,1 D. BIEK,2 I. RITCHLEY,3 D.J. FARRELL,4 R.N. JONES1

1JMI Laboratories, North Liberty, IA, 2Cerexa, Inc., Oakland, California, USA (a wholly owned subsidiary of Forest Laboratories, Inc., New York, New York, USA)

Abstract

Introduction

Ceftaroline (CPT) is a novel, broad-spectrum cephalosporin exhibiting bactericidal activity against Gram-positive organisms, including MRSA and multidrug-resistant *Staphylococcus pneumoniae* (MRSP), as well as common Gram-negative pathogens. CPT is an orally active cephalosporin indicated for complicated skin and skin structure infections (cSSSI) and community-acquired bacterial pneumonia. *S. aureus* is the main cause of cSSSI. We assessed the activity of CPT tested against *S. aureus* from USA hospitals.

Methods

A total of 40 medical centers geographically distributed throughout the USA contributed a total of 35,374 clinical isolates of *S. aureus* from hospitalized patients from 2008 to 2009. In addition, a molecularly characterized set of 10 *S. aureus* isolates from cSSSI with a USA300-0114 type were also tested.

Results

The methods (susceptibility) (MIC) were based upon criteria as published by the CLSI [2010]. β lactams were performed to determine the antimicrobial activity of CPT against various comparator agents when tested against current *S. aureus* from USA (3,537) - - 3 (0.1) 47 (1.4) 1,387 (40.6) 1,931 (95.2) 169 (100.0)a

<table>
<thead>
<tr>
<th>Organism (no. tested)/MIC (µg/mL)</th>
<th>≤0.06</th>
<th>≤0.12</th>
<th>≤0.25</th>
<th>≤0.5</th>
<th>≤1</th>
<th>&gt;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSSA (6,626)</td>
<td>2 (0.1)</td>
<td>21 (0.4)</td>
<td>174 (3.0)</td>
<td>2,639 (42.9)</td>
<td>1,681 (68.2)</td>
<td>1,937 (97.5)</td>
</tr>
<tr>
<td>Methicillin-resistant (3537)</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>MRSA</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
</tr>
<tr>
<td>MSSA (6,626)</td>
<td>2 (0.1)</td>
<td>21 (0.4)</td>
<td>174 (3.0)</td>
<td>2,639 (42.9)</td>
<td>1,681 (68.2)</td>
<td>1,937 (97.5)</td>
</tr>
<tr>
<td>Methicillin-resistant (3537)</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>MRSA</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
<td>99.8%</td>
</tr>
</tbody>
</table>

Conclusions

• Ceftaroline was highly active against this large collection of recent (2008-2009) MSSA and MRSA strains isolated from cSSSI.
• Against the small set of representative strains of the pandemic USA300 clone of community-acquired MRSA, ceftaroline demonstrated excellent activity, with all strains inhibited by ≤0.1 µg/mL.
• Based on the broad-spectrum coverage and excellent MRSA activity, ceftaroline is considered a promising option for the treatment of cSSSI, including those caused by MRSA.

References

9. Zhao, X. (2009). Ceftaroline fosamil is the prodrug of ceftaroline, a novel, broad-spectrum cephalosporin that has bactericidal activity against resistant Gram-positive pathogens, including methicillin-resistant *Staphylococcus aureus* (MRSA) and multidrug-resistant *Staphylococcus pneumoniae* (MRSP), as well as common Gram-negative pathogens. CPT represents a stepwise development for treatment of complicated skin and skin structure infections (cSSSI) and community-acquired bacterial pneumonia. Encouraging results have been reported from phase 3 investigations that compared the efficacy of ceftaroline with vancomycin plus aztreonam for the treatment of cSSSI. Conference on Antimicrobial Agents and Chemotherapy.

Acknowledgment

Acknowledged to Forest Laboratories, Inc.