ABSTRACT

A multicenter study was performed to evaluate the performance of a MicroScan Dried Gram Negative MIC panel with ceftazidime/avibactam using Enterobacteriaceae and Pseudomonas aeruginosa isolates with FDA interpretive breakpoints.

METHODS (Continued)

Panels
•Reference freeze and MicroScan Dried Gram Negative MIC panels consisted of four doubling dilutions of ceftazidime/avibactam 0.25/4-64/4 μg/ml in cation-adjusted Mueller-Hinton broth.
•Reference panels were prepared and frozen following CLSI recommendations.

Reproducibility
•Reproducibility organsms with known results on scale for ceftazidime/avibactam were tested in triplicate (for each inoculation method) on the MicroScan Dried Gram Negative MIC panels and singly on the frozen reference panel on three different days at each site.
•MicroScan Dried Gram Negative MIC panels were tested using both the turbidity and Prompt inoculation methods and read on the WalkAway System, autoSCAN-4 instrument and manually.

Quality Control
•Quality control (QC) testing was performed daily using ATCC 25922 E. coli, ATCC 21963 P. aeruginosa, ATCC 700603 pneumococcus, ATCC 35218 E. coli using FDA and CLSI QC ranges.

Panel Inoculation, Incubation, and Reading
•All isolates were subcultured on Columbia agar (TGA) with 5% sheep blood and incubated for 18-24 hours at 34-37°C prior to testing. Isolates from frozen stocks were subcultured twice before testing.
•Inoculum suspensions for each strain were prepared with the direct standardized (turbidity standard) method for MicroScan MIC and frozen reference panels. Microscan MIC panels were also inoculated using the Prompt inoculation method.
•Following inoculation, MicroScan MIC panels were inoculated at 35 ± 2°C in the WalkAway System for 18-22 hours. All panels were read by the WalkAway, autoSCAN-4, and visually.

Data Analysis
•Essential Agreement (EA) = MicroScan panel MIC within +/- 1 dilution of the frozen reference result MIC.
•Categorical Agreement (CA) = MicroScan panel and reference categorical results (S, R) agree using FDA breakpoints for Enterobacteriaceae and Pseudomonas aeruginosa (Table 1).

RESULTS

Table 1. Cefazidime/Avibactam FDA Interpretive Breakpoints(μg/ml)

<table>
<thead>
<tr>
<th>Organism Group</th>
<th>S</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterobacteriaceae</td>
<td>4 ≤</td>
<td>164</td>
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<tr>
<td>Pseudomonas aeruginosa</td>
<td>8 ≤</td>
<td>164</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Errors</th>
<th>No.</th>
<th>No. %</th>
<th>No.</th>
<th>No. %</th>
<th>No.</th>
<th>No. %</th>
<th>No.</th>
<th>No. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference MIC</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
</tr>
<tr>
<td>MicroScan MIC</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
<td>5 ≤</td>
<td>164</td>
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<tr>
<th>Minor Errors</th>
<th>No.</th>
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<th>No.</th>
<th>No. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference MIC</td>
<td>3 ≤</td>
<td>164</td>
<td>3 ≤</td>
<td>164</td>
<td>3 ≤</td>
<td>164</td>
<td>3 ≤</td>
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<tr>
<td>MicroScan MIC</td>
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<td>164</td>
<td>3 ≤</td>
<td>164</td>
<td>3 ≤</td>
<td>164</td>
<td>3 ≤</td>
<td>164</td>
</tr>
</tbody>
</table>

Effectiveness & Challenge (Tables 2 and 3)
•A total of 734 Enterobacteriaceae and Pseudomonas aeruginosa clinical isolates were inoculated among three sites. Microscan MIC panels were inoculated using the turbidity inoculation method.
•Essential Agreement for Enterobacteriaceae and Pseudomonas aeruginosa between MicroScan panel and frozen reference panel was 98.8% (725/734) for manual read method, 98.9% (726/734) for WalkAway System, 98.9% (725/734) for autoSCAN-4 instrument using the turbidity inoculation method.
•Categorical Agreement for Enterobacteriaceae and Pseudomonas aeruginosa between MicroScan panel and frozen reference panel was 99.2% (728/734) for manual read method, 99.2% (728/734) for WalkAway System, 99.2% (728/734) for autoSCAN-4 instrument using the turbidity inoculation method.

Panel Specific QC Expected Results

164/164 99.9% 163/164 99.8% 164/164 100% 164/164 100% 164/164 100%

0.25/4 99.6% 0.25/4 99.7% 0.25/4 100% 0.25/4 100% 0.25/4 100%

There is a correlation between the MIC results obtained using MicroScan Dried Gram-Negative panel and MICs obtained using a CLSI broth microdilution reference panel for susceptibility testing of the new cefazidime/avibactam formulation for Enterobacteriaceae and Pseudomonas aeruginosa in a multicenter study using FDA interpretive criteria.

This study was supported by Pfizer, Inc. and Afergan, plc.