Aerococcus sanguinicola and urinae

Calibration of zone diameter breakpoints to MIC values

Version 2.0
January 2020
Aerococcus sanguinicola and urinae MIC and zone diameter correlates

- The following histograms present inhibition zone diameter distributions from EUCAST antimicrobial susceptibility testing. In most, the different colours of the bars indicate different MIC values. In some, the colours of the bars indicate a resistance gene or a resistance mechanism.

- The distributions include data for wild-type isolates and for isolates with acquired resistance mechanisms. A large number of isolates with MIC values close to the edge of the wild-type distribution and/or close to EUCAST clinical breakpoints were intentionally included. These distributions can not be used to infer resistance rates or the performance of the tests with routine isolates.

- For some agents, isolates were tested on more than one occasion, including parallel tests with disks and media from several manufacturers. When this is the case, data are presented as both the “number of isolates tested” and the “total number of MIC-zone diameter correlates”, including replicate tests and parallel tests with disks and media from different sources.
Aerococcus sanguinicola and urinae
Materials and methods

• Antimicrobial susceptibility testing was performed on clinical isolates of Aerococcus sanguinicola and urinae collected from several laboratories, including isolates with known resistance mechanisms. Disk diffusion was performed on MH-F media according to EUCAST methodology and MICs were determined with the ISO broth microdilution method, agar dilution or gradient tests on MH-F media.

• The distributions of MIC vs. zone diameter in this presentation are the result of a collaboration between EUCAST; Clinical Microbiology, Slagelse Hospital, Denmark; Public Health Wales, Cardiff, UK; CHU Côte de Nacre, France and Clinical Microbiology, Lund, Sweden.

• This presentation is based on EUCAST Clinical Breakpoint Tables v. 10.0.
Changes from previous version (1.2)

<table>
<thead>
<tr>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Data added for <em>Aerococcus urinae</em> with benzylpenicillin and ampicillin.</td>
</tr>
</tbody>
</table>
Explanation of graphs:

- These graphs show zone diameter distributions with MIC values or resistance mechanisms as coloured bars. Colours are related to current EUCAST MIC breakpoints.

**Agent X**

- MIC (mg/L): 
  - ≥8: Resistant
  - 4: Susceptible, increased exposure
  - 2: Susceptible, standard dosing regimen
  - 1: Susceptible, standard dosing regimen
  - 0.5: Susceptible, standard dosing regimen
  - ≤0.25: Susceptible, standard dosing regimen

**Agent Y**

- MIC (mg/L): 
  - ≥64: Resistant
  - 32: Susceptible, increased exposure
  - 16: Susceptible, increased exposure
  - 8: Susceptible, increased exposure
  - 4: Susceptible, increased exposure
  - 2: Susceptible, increased exposure
  - 1: Susceptible, increased exposure
  - 0.5: Susceptible, increased exposure
  - ≤0.25: Susceptible, increased exposure
Benzylpenicillin 1 unit vs. MIC
*A. urinae* and *A. sanguinicola*, 215 isolates (449 correlates)

(3 data sources)

**Breakpoints**

- **MIC (mg/L)**
  - S ≤ 0.125, R > 0.125 mg/L
  - 0.5
  - 0.25
  - 0.125
  - 0.06
  - ≤ 0.03

- **Zone diameter**
  - S ≥ 21, R < 21 mm
Benzylpenicillin 1 unit vs. MIC
A. urinae, 127 isolates (268 correlates)

(3 data sources)

**Breakpoints**

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>Breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤0.03</td>
<td>S≥21, R&lt;21 mm</td>
</tr>
<tr>
<td>0.06</td>
<td>S≥36, R&lt;36 mm</td>
</tr>
<tr>
<td>0.125</td>
<td>S≥34, R&lt;34 mm</td>
</tr>
<tr>
<td>0.25</td>
<td>S≥32, R&lt;32 mm</td>
</tr>
<tr>
<td>0.5</td>
<td>S≥30, R&lt;30 mm</td>
</tr>
</tbody>
</table>

Inhibition zone diameter (mm)

No of observations
Benzylpenicillin 1 unit vs. MIC
*A. sanguinicola*, 87 isolates (181 correlates)

(3 data sources)

**Breakpoints**

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>S ≤ 0.125, R &gt; 0.125 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone diameter</td>
<td>S ≥ 21, R &lt; 21 mm</td>
</tr>
</tbody>
</table>

**MIC (mg/L)**
- 0.125
- 0.06
- ≤ 0.03

**Inhibition zone diameter (mm)**

No of observations
Ampicillin 2 µg vs. MIC
*A. urinae* and *A. sanguinicola*, 62 isolates (122 correlates)

(1 data source)

**Breakpoints**
- **MIC**
  - S\(\leq 0.25\), R\(>0.25\) mg/L
- **Zone diameter**
  - S\(\geq 26\), R<26 mm

**MIC (mg/L)**
- 1
- 0.5
- 0.25
- 0.125
- 0.06
- 0.03
- \(\leq 0.016\)
Ampicillin 2 µg vs. MIC
A. urinae, 32 isolates (62 correlates)

(1 data source)

Breakpoints

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>Zone diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>S≤0.25, R&gt;0.25</td>
<td>S≥26, R&lt;26 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>0.25</td>
</tr>
<tr>
<td>0.125</td>
</tr>
<tr>
<td>0.06</td>
</tr>
<tr>
<td>0.03</td>
</tr>
<tr>
<td>≤0.016</td>
</tr>
</tbody>
</table>
Ampicillin 2 µg vs. MIC
*A. sanguinicola*, 30 isolates (60 correlates)

(1 data source)

**Breakpoints**
- **MIC**: S ≤ 0.25, R > 0.25 mg/L
- **Zone diameter**: S ≥ 26, R < 26 mm
Meropenem 10 µg vs. MIC
A. urinae and A. sanguinicola, 192 isolates (218 correlates)

(3 data sources)

Inhibition zone diameter (mm)

No of observations

MIC (mg/L)
- 0.25
- 0.125
- 0.06
- 0.03
- 0.016
- ≤0.008

Breakpoints

MIC S≤0.25, R>0.25 mg/L
Zone diameter S≥31, R<31 mm
Meropenem 10 µg vs. MIC
A. urinae, 117 isolates (139 correlates)

(3 data sources)

No of observations vs. Inhibition zone diameter (mm)

Breakpoints:
- MIC: S ≤ 0.25, R > 0.25 mg/L
- Zone diameter: S ≥ 31, R < 31 mm
**Meropenem 10 µg vs. MIC**

*A. sanguinicola*, 77 isolates (107 correlates)  

(3 data sources)

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### Breakpoints

- **MIC**  
  - $S \leq 0.25$, $R > 0.25$ mg/L

- **Zone diameter**  
  - $S \geq 31$, $R < 31$ mm
Ciprofloxacin 5 µg vs. MIC
A. urinae and A. sanguinicola, 60 isolates

(1 data source)

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>No of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>0.25</td>
<td>1</td>
</tr>
</tbody>
</table>

**Breakpoints**
- MIC: S≤2, R>2 mg/L
- Zone diameter: S≥21, R<21 mm
Ciprofloxacin 5 µg vs. MIC
*A. urinae*, 30 isolates

(1 data source)

**Breakpoints**
- MIC
  - S≤2, R>2 mg/L
- Zone diameter
  - S≥21, R<21 mm
Ciprofloxacin 5 µg vs. MIC
A. sanguinicola, 30 isolates

(1 data source)

**Breakpoints**
- MIC: S≤2, R>2 mg/L
- Zone diameter: S≥21, R<21 mm
Norfloxacin 10 µg vs. Ciprofloxacin MIC
A. urinae and A. sanguinicola, 59 isolates

(1 data source)

No of observations

Inhibition zone diameter (mm)

Breakpoints
Ciprofloxacin MIC  S≤2, R>2 mg/L
Norfloxacin zone diameter (screen)  S≥17, R<17 mm
Norfloxacin 10 µg vs. Ciprofloxacin MIC  
*A. urinae*, 29 isolates  
(1 data source)

Breakpoints

<table>
<thead>
<tr>
<th>Ciprofloxacin MIC</th>
<th>Norfloxacin zone diameter (screen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S≤2, R&gt;2 mg/L</td>
<td>S≥17, R&lt;17 mm</td>
</tr>
</tbody>
</table>
Norfloxacin 10 µg vs. Ciprofloxacin MIC

*A. sanguinicola*, 30 isolates

(1 data source)

**Breakpoints**
- Ciprofloxacin MIC: S≤2, R>2 mg/L
- Norfloxacin zone diameter (screen): S≥17, R<17 mm
Norfloxacin 10 µg vs. Levofloxacin MIC
A. urinae and A. sanguinicola, 58 isolates

(1 data source)

Breakpoints
Levofloxacin MIC S≤2, R>2 mg/L
Norfloxacin zone diameter (screen) S≥17, R<17 mm
Norfloxacin 10 µg vs. Levofloxacin MIC
A. urinae, 28 isolates

(1 data source)

Breakpoints
Levofloxacin MIC  
S≤2, R>2 mg/L
Norfloxacin zone diameter (screen)  
S≥17, R<17 mm
Norfloxacin 10 µg vs. Levofloxacin MIC
*A. sanguinicola*, 30 isolates

(1 data source)

**Breakpoints**
- Levofloxacin MIC: S≤2, R>2 mg/L
- Norfloxacin zone diameter (screen): S≥17, R<17 mm
Vancomycin 5 µg vs. MIC
*A. urinae* and *A. sanguinicola*, 204 isolates (257 correlates)

(2 data sources)

### Breakpoints

<table>
<thead>
<tr>
<th>MIC</th>
<th>S≤1, R&gt;1 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone diameter</td>
<td>S≥16, R&lt;16 mm</td>
</tr>
</tbody>
</table>
Vancomycin 5 µg vs. MIC
A. urinae, 120 isolates (150 correlates)

(2 data sources)

| MIC (mg/L) | S≤0.5 |

**Breakpoints**

<table>
<thead>
<tr>
<th>MIC</th>
<th>S≤1, R&gt;1 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone diameter</td>
<td>S≥16, R&lt;16 mm</td>
</tr>
</tbody>
</table>
Vancomycin 5 μg vs. MIC
A. sanguinicola, 84 isolates (107 correlates)

(2 data sources)

**Breakpoints**

- **MIC**
  - S≤1, R>1 mg/L
- **Zone diameter**
  - S≥16, R<16 mm
Nitrofurantoin 100 µg vs. MIC
A. urinae and A. sanguinicola, 60 isolates (120 correlates)

(2 data sources)

Inhibition zone diameter (mm)

Breakpoints
MIC
S≤16, R>16 mg/L
Zone diameter
S≥16, R<16 mm
Nitrofurantoin 100 µg vs. MIC
*A. urinae*, 30 isolates (60 correlates)

(2 data sources)

### Breakpoints
- **MIC**
  - S ≤ 16, R > 16 mg/L
- **Zone diameter**
  - S ≥ 16, R < 16 mm
Nitrofurantoin 100 µg vs. MIC
*A. sanguinicola*, 30 isolates (60 correlates)

(2 data sources)

**Breakpoints**

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>S ≤ 16, R &gt; 16 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone diameter</td>
<td>S ≥ 16, R &lt; 16 mm</td>
</tr>
</tbody>
</table>
Rifampicin 5 µg vs. MIC

*A. urinae* and *A. sanguinicola*, 190 isolates (232 correlates)

(3 data sources)

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>Breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤0.002</td>
<td>≥25, R&lt;25 mm</td>
</tr>
<tr>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>0.125</td>
<td>≥25, R&lt;25 mm</td>
</tr>
</tbody>
</table>

**Zone diameter**

**MIC**

S≤0.125, R>0.125 mg/L
Rifampicin 5 µg vs. MIC
A. urinae, 112 isolates (125 correlates)

(3 data sources)

**Breakpoints**

<table>
<thead>
<tr>
<th>MIC (mg/L)</th>
<th>Breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&lt;0.125, R&gt;0.125</td>
<td>Zone diameter S≥25, R&lt;25 mm</td>
</tr>
</tbody>
</table>
Rifampicin 5 µg vs. MIC
A. sanguinicola, 77 isolates (107 correlates)

(3 data sources)

**Breakpoints**

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<th>MIC (mg/L)</th>
<th>S≤0.125, R&gt;0.125 mg/L</th>
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<td>Zone diameter</td>
<td>S≥25, R&lt;25 mm</td>
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