**INTRODUCTION**

- Carbapenem-resistant *Pseudomonas aeruginosa* are the most common carbapenem-resistant pathogen encountered clinically

**METHODS**

- Isolates were collected from 2009 – 2014 from unique patients at the University of Pittsburgh Medical Center
- Carbapenem resistance was defined as a meropenem minimum inhibitory concentration (MIC) ≥ 4 µg/ml

**Susceptibility Testing:**
- Beta-lactam and aminoglycoside MICs were determined by standard broth microdilution methods for all agents
- Ceftazidime-avibactam was tested with fixed conc. of avibactam (4 µg/mL)
- Cefepime-avibactam was tested by Etest

**β-lactamase Detection:**
- Beta-lactamases (TEM, SHV-12, CTX-M, KPC, NDM, IMIP, VIM, OXA-48) and OprD mutations were detected by PCR and PCR/DNA sequencing, respectively

**Statistical Analysis:**
- Median MICs and fold-change were compared between groups by Mann-Whitney

**RESULTS**

**Isolate Characteristics**

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Range</th>
<th>50%</th>
<th>90%</th>
<th>S</th>
<th>I</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftolozane-tazobactam</td>
<td>≤0.25</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Ceftazidime-avibactam</td>
<td>≤0.25</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

- Median ceftazidime and ceftazidime-avibactam MICs were 16 (range: 2 – 2048) and 4 (1 – 64) µg/mL, respectively

**CONCLUSIONS**

- Judicious use of newly approved antimicrobial agents is imperative to their long-term utility
- Plazomicin offers comparable activity to amikacin, which is superior to other aminoglycosides against carbapenem-resistant *P. aeruginosa*

**ACKNOWLEDGMENTS**

This project is supported by the National Institutes of Health through grant numbers KL2 RR024154 and K08 AI114883

---

**Isolate Characteristics (continued)**

- Median ceftazidime-avibactam MIC was 1 (range: 0.25 – 32) µg/mL
- 91% of isolates were considered susceptible (breakpoint ≤ 4 µg/mL)

**CONCLUSIONS**

- Plazomicin MICs were comparable to amikacin; median = 4 (range: 1 – 64) µg/mL

---

**Figure 1: Waves of carbapenem-resistant pathogens at UPMC**

**Figure 2: β-lactamases and porin genotype among *P. aeruginosa***

**Figure 3: Ceftazidime and ceftazidime-avibactam MICs against *P. aeruginosa***

**Figure 4: Ceftazidime-avibactam and ceftolozane-tazobactam activity***

**Figure 5: Ceftazidime-avibactam and piperacillin-tazobactam MICs***

**Figure 6: Amikacin and plazomicin MICs against *P. aeruginosa***

---

**Contact Information:**
Ryan K. Shields, PharmD, MS
Assistant Professor of Medicine
3601 Fifth Avenue
Falk Medical Building, Suite 3A
Pittsburgh, PA 15213
Phone: (412) 864-3745
E-mail: shieldsrk@upmc.edu