Lower Rates of Antibiotic Treatment of Vancomycin-Resistant Compared to Vancomycin-Susceptible Enterococcal Bacteriuria

Bridget Vendittelli, PharmD 1,2; Pramodini B. Kale-Pradhan, PharmD1,2; and Leonard B. Johnson, MD1
Ascension St. John Hospital1, Eugene Applebaum College of Pharmacy and Health Sciences2, Detroit, MI

Introduction

• According to the IDSA guidelines, most asymptomatic bacteriuria should not be treated.
• Identification of drug resistance often leads to inappropriate antibiotic prescribing.
• Screening for vancomycin-resistance among enterococcal urine isolates is performed at some institutions for infection control purposes.
• We evaluated prescribing patterns of vancomycin-resistant enterococci (VRE) and vancomycin-susceptible enterococci (VSE) at a regional health system to determine if identification of vancomycin resistance results in increased rates of therapy.

Methods

• Design: Multicenter retrospective chart review project.
• Inclusion: All adult inpatients at the Ascension St. John Providence Health System with positive urine culture identified as VRE or VSE between 4/1/17-10/1/17.
• Exclusion: Patients with medical records that were unavailable.
• Matching: Groups were matched to hospital location, age within 5 years and gender.
• Definition: Bacteriuria was defined as a UTI with fever or concomitant enterococcal bacteremia.
• Data collection:
  • Demographics (age, sex)
  • Location of patient (institution)
  • ID consult
  • Fever, other localized symptoms
  • Results of blood cultures (if performed)
  • Treatment (antibiotic class and the duration of treatment)
• We evaluated frequency of treatment as well as type and duration of antibiotics.

Statistical Methods

• Descriptive statistics used to characterize the study population.
• Continuous variables described as the mean ± SD or median with range.
• Categorical variables described as frequency distributions.

The project was approved by Ascension St John Institutional Review Board

Results

Figure 1. Study Subjects

Table 1. Patient Characteristics

<table>
<thead>
<tr>
<th></th>
<th>VRE+</th>
<th>VSE+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>70.4</td>
<td>71.3</td>
</tr>
<tr>
<td>Gender (% Male)</td>
<td>35.8</td>
<td>35.5</td>
</tr>
<tr>
<td>VRE (+) Blood Cultures</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Fever within 48 hours</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>PCN allergy</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>ID consult (%)</td>
<td>89</td>
<td>62</td>
</tr>
</tbody>
</table>

Table 2. Number of Patients with VRE/VSE by Institution

<table>
<thead>
<tr>
<th>Site</th>
<th>Included</th>
<th>Fever</th>
<th>VRE/VSE + BCx</th>
<th>Median length of Rx (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital 1</td>
<td>22/22</td>
<td>8/4</td>
<td>2/2</td>
<td>7/14/6</td>
</tr>
<tr>
<td>Hospital 2</td>
<td>47/47</td>
<td>8/5</td>
<td>0/0</td>
<td>7/7</td>
</tr>
<tr>
<td>Hospital 3</td>
<td>55/55</td>
<td>2/0</td>
<td>0/0</td>
<td>7/13</td>
</tr>
<tr>
<td>Hospital 4</td>
<td>22/22</td>
<td>3/3</td>
<td>0/1</td>
<td>7/7</td>
</tr>
<tr>
<td>Hospital 5</td>
<td>10/10</td>
<td>2/3</td>
<td>0/0</td>
<td>6/5/8.5</td>
</tr>
<tr>
<td>Total</td>
<td>106/106</td>
<td>23/15</td>
<td>(p=0.21)</td>
<td>7/7</td>
</tr>
</tbody>
</table>

Summary

• There was wide variability among institutions in the frequency of treatment of enterococcal bacteriuria.
• Choice of VRE treatment differed by institution.
• Hospital 2 had a total of 15 VRE cases treated; 11 of which were treated with linezolid.
• Choice of therapy for VSE was similar between institutions with either a β-lactam or vancomycin being utilized.
• ID consults were higher in the VRE group compared to the VSE group.

Conclusions

• The rates of treatment were higher with the VSE group compared to the VRE group.
• Identification of vancomycin resistance didn’t lead to increased antibiotic utilization.
• ID was more frequently consulted in patients with VRE and those patients were treated less frequently.

Limitations

• Retrospective chart review
• Limited sample size

Future Directions

• The Antimicrobial Stewardship Committee needs to help develop policies that would restrict the use of inappropriate therapeutics, such as treatment of asymptomatic bacteriuria.

References