Antimicrobial Stewardship Initiatives to Optimize Vancomycin Dosing and Reduce Nephrotoxicity

Zhe Han, PharmD1 | Natasha N. Pettit, PharmD1 | Emily Landon, MD2 | Benjamin D. Brielmaier, PharmD1
1 Department of Pharmaceutical Services, 2 Department of Medicine Section of Infectious Diseases and Global Health

Background

- Antimicrobial stewardship programs (ASPs) provide evidence-based approaches to judicious antimicrobial use
- Intended outcomes are multi-faceted
  - Enhance patient safety
  - Improve patient outcome
  - Reduce antimicrobial resistance
  - Minimize healthcare cost
- Examples of key stewardship strategies include
  - Prospective auditing with feedback
  - Preauthorization
  - Education
  - Streamlining of therapy
- Vancomycin is frequently used for gram-positive infections in the inpatient setting
  - Therapeutic trough concentrations necessary for therapeutic efficacy
  - Highly variable incidence of nephrotoxicity (1.0-42.6%)

Aims

- Vancomycin dose optimization
- Improve initial therapeutic trough attainment
- Minimize vancomycin-associated nephrotoxicity

Methods

- Pre versus post interventions, compare
  - Vancomycin dosing
  - Initial vancomycin trough concentrations
  - Incidence of vancomycin-associated nephrotoxicity

Interventions

- Development of institutional adult vancomycin dosing guideline
- Formalized Clinical Pharmacokinetic (PK) Consult Service
- 24 hours, 7 day per week (24/7) Clinical PK Consult Service

Results

<table>
<thead>
<tr>
<th></th>
<th>PRE-Implementation</th>
<th>POST-Implementation</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of Courses with Initial LD</td>
<td>4 (1.8)</td>
<td>22 (10.0)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Initial MD (mg/kg)</td>
<td>13.8 (11.8 – 16.6)</td>
<td>15.9 (13.7 – 18.4)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Lessons Learned/Conclusions

- Standardized dosing guideline for clinicians, 24/7 dosing and therapeutic drug monitoring optimizes vancomycin dosing
- Dose optimization allows for improved initial therapeutic trough attainment and patient safety

Next Steps

- Optimize/evaluate vancomycin dosing and safety in special patient populations with altered PK parameters (e.g., obesity)

Contact: Zhe Han, PharmD | Zhe.Han@uchospitals.edu