Increasing resistance patterns are leading to higher trough concentrations of 15-20 mg/L. • A target of 5-15 mg/L is still used in clinical practice.
• Complicated infections (bacteremia, endocarditis, meningitis, osteomyelitis and pneumonia) should target trough serum concentrations of 15-20 mg/L.
• Empiric dosing of 40-60 mg/kg/day divided every 6 to 8 hours has provided subtherapeutic levels both anecdotally at our institution as well as within the literature.

Our study aims to determine the suitability of the empiric vancomycin regimen and what percent of empiric dosing provides concentrations within IDSA target trough ranges.

**Objectives**

• Determine the percentage of patients within FHA with appropriate trough serum levels after initial empiric dosing.
• If appropriate, suggest changes to empiric vancomycin dosing.
• Determine the proportion of patients requiring a trough of 15-20 mg/L (complicated infections).
• Determine the average number of vancomycin levels required to be drawn.
• Determine the need to transfer to higher level of care, add-on antimicrobial therapy and length of stay between patients for different trough ranges.

**Methods**

• Retrospective chart review
  • Within Fraser Health (RCH, ARH, and SMH).
  • Between May 1st 2004 and May 31st 2012.
• Inclusion: Patients who received IV vancomycin with at least one trough concentration taken.
• Exclusion: Neonates (postmenstrual age less than 45 weeks) and patients over the age of 16 years.
• Statistical analysis using descriptive statistics.

**Results**

**Table 1: Patient Characteristics**

<table>
<thead>
<tr>
<th>Variable (n=132)</th>
<th>Mean ± SD (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>6.6 ± 4.0 (1-18)</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>17.2 ± 8.2 (6.3-36.9)</td>
</tr>
<tr>
<td>Serum creatinine (mg/dL)</td>
<td>0.6 ± 0.2 (0.2-1.2)</td>
</tr>
<tr>
<td>Total bilirubin (mg/dL)</td>
<td>0.2 ± 0.1 (0.1-0.5)</td>
</tr>
</tbody>
</table>

**Table 2: Patient Results**

<table>
<thead>
<tr>
<th>Trough (mg/L)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under Target</td>
<td>Over Target</td>
</tr>
<tr>
<td>10-15</td>
<td>45%</td>
</tr>
<tr>
<td>15-20</td>
<td>25%</td>
</tr>
<tr>
<td>20-25</td>
<td>80%</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Table 3: Pharmacokinetic Results**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean ± SD (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean T1/2 (h)</td>
<td>3.1 ± 1.1 (1.1-7.9)</td>
</tr>
<tr>
<td>Mean CL (L/h)</td>
<td>259 ± 208 (70-793)</td>
</tr>
<tr>
<td>Mean CL/F</td>
<td>0.18 ± 0.04 (0.09-0.22)</td>
</tr>
<tr>
<td>Mean Vz (L)</td>
<td>8.8 ± 1.5 (3.5-17.0)</td>
</tr>
<tr>
<td>Mean V/F</td>
<td>0.34 ± 0.08 (0.21-0.50)</td>
</tr>
</tbody>
</table>

**Figure 1: Patient Inclusion Flowchart**

**Figure 2: Trough Concentrations by Age**

**Figure 3: Patients Within Target (Uncomplicated)**

**Figure 4: Patients Within Target (Complicated)**

**Proposed Regimen**

**Figure 5: Possible Regimens: Anticipated Troughs**

**Figure 6: Uncomplicated Infections within Target (60 mg/kg/day div Q6H)**

**Figure 7: Complicated Infections within Target (40 mg/kg/day div Q6H)**

**Limitations**

• Retrospective.
• Actual administration time can be within 30 minutes of documented time.
• Limited number of patients with peak and trough levels drawn at steady state.

**Conclusions**

• Empiric dosing within Fraser Health is providing subtherapeutic levels.
  • Uncomplicated infections (39% of infections)
  • 13% within target of 10-20 mg/L
  • Complicated infections (61% of infections)
  • 2% within target of 15-20 mg/L
• Suggest changing empiric vancomycin regimen to 80 mg/kg/day divided Q6H.
  • 59% will be within target for uncomplicated infections
  • 25% will be within target for complicated infections
• Follow prospectively to determine success of proposed regimen.

**Background**

• Vancomycin is commonly used in the pediatric population.
• Increasing resistance patterns are leading to higher trough recommendations.
• The Infectious Disease Society of America (IDSA) recommends:
  • Uncomplicated infections should target trough serum concentrations of 10-20 mg/L.
• A target of 5-15 mg/L is still used in clinical practice.
• Complicated infections (bacteremia, endocarditis, meningitis, osteomyelitis and pneumonia) should target trough serum concentrations of 15-20 mg/L.