Antibiotic Use Among Patients with COVID-19
Jennifer Walling, PharmD and Lauren Bricker, PharmD, BCIDP
Ascension Via Christi Hospitals, Wichita, Kansas

Background
• Bacterial coinfection complicated approximately 31% of ICU managed SARS-CoV-1 patients 1.
• However, limited evidence of bacterial coinfection in SARS-CoV-2.
• Multi-hospital cohort (n=1,700) from March 2020 to June 2020 found 84% of patients were treated with antibiotics 2.
  ○ Confirmed coinfection in only 3.5% of patients
  ○ Respiratory pathogen identified in only 1.7% of patients
• Systematic review found more than 90% of patients with COVID-19 received antibiotics 3.
  ○ Evidence of bacterial coinfection in only 7% of patients

Methods
• Retrospective chart review of patients with COVID-19 treated with ceftriaxone, cefepime, or piperacillin-tazobactam during hospitalization.
• Study Period: July 1, 2020 - September 30, 2020

Inclusion
• Adults ≥18 years old with COVID-19
• Admitted to: ○ Medical ICU or 5 North (COVID units)
  Treated with: ○ Ceftriaxone, cefepime, and/or piperacillin-tazobactam

Objectives
• Primary Objective: Describe the percentage of patients with COVID-19 treated with ceftriaxone, cefepime, or piperacillin-tazobactam during hospitalization.
• Secondary Objectives:
  ○ Average day of antibiotic initiation
  ○ Average duration of antibiotic therapy
  ○ Number of positive respiratory cultures
  ○ Number of other positive cultures (non-respiratory)
  ○ Number of positive urinary antigen tests
  ○ Number of positive procalcitonin values (>0.25 ng/mL)

Results

Figure 1: Patients Evaluated for Inclusion

Table 1: Primary and Secondary Objectives

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Result (n=251)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Objective</strong></td>
<td></td>
</tr>
<tr>
<td>Patients Treated, n (%)</td>
<td>166 (57.4)</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>81 (28.0)</td>
</tr>
<tr>
<td>Cefepime</td>
<td>42 (14.5)</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td></td>
</tr>
<tr>
<td>Day of Antibiotic Initiation, Mean (days)</td>
<td>1 (68.9)</td>
</tr>
<tr>
<td>Duration of Antibiotic Therapy, Median (IQR)</td>
<td>5 (2-6)</td>
</tr>
<tr>
<td>Positive Respiratory Cultures, n (%)</td>
<td>20 (7.9)</td>
</tr>
<tr>
<td>Other Positive Cultures, n (%)</td>
<td>51 (20.0)</td>
</tr>
<tr>
<td><strong>Secondary Objectives</strong></td>
<td></td>
</tr>
<tr>
<td>Positive Urinary Antigen Test, n (%)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Streptococcus pneumoniae</td>
<td>(n=18)</td>
</tr>
<tr>
<td>Legionella pneumophilia</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Procalcitonin ≥0.25 ng/mL, n (%)</td>
<td>82 (48.0)</td>
</tr>
<tr>
<td>(n=171)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Duration of Antibiotics

Limitations
• Single center, retrospective chart review
• Patients evaluated for inclusion based on hospital location
• Did not collect data on azithromycin, vancomycin, or remdesivir
• Respiratory cultures considered positive if any growth occurred

Conclusions
• Despite limited data, antibiotics routinely used for bacterial coinfection upon presentation with COVID-19 may be unnecessary.
• Expeditious initiation upon presentation for primarily viral etiology is likely unnecessary.
• Need judicious use of antibiotics to prevent widespread resistance.

Acknowledgements
The authors would like to acknowledge Stephen Le, Tommy Dao, and Hunter Rondeau, PharmD Candidates for their contributions in data collection.

Disclosure
The authors of this research project have nothing to disclose concerning possible financial or personal conflicts of interest.

References

Please contact Jennifer Walling, PharmD at Jennifer.Walling@ascension.org for further questions.