Antibiotic Stewardship Practices during COVID-19

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Disclosures

• I have no relevant disclosures or financial relationships with commercial entities producing healthcare related products or services
Objectives

• Discuss challenges that the SARS-CoV-2 pandemic have presented to antimicrobial stewardship programs in the United States
• Describe opportunities for antimicrobial stewardship learned from the pandemic
Antimicrobial (an-ti-mī-ˈkrō-bē-əl)
destroying or inhibiting the growth of microorganisms and especially pathogenic microorganisms

Stewardship (ˈstū-ərd-ˌship)
the activity or job of protecting and being responsible for something
Antibiotics are a shared resource
Antibiotics are misused in hospitals – up to 50% of use is unnecessary or inappropriate
Antibiotics are a leading cause of ED visits for medication related adverse events
Overuse contributes to antibiotic resistance and the growing C. difficile problem
Improving antibiotic use is a public health imperative
The Challenges
Barriers to Successful Stewardship in a Pandemic

Diagnostic Uncertainty
• Minimal aerosol generating procedures and PPE conservation

Novelty of Disease State
• Rates of bacterial or fungal co-infection not well described

Personnel Shifts
• Stewards redirected to other roles
Local Experience – Diagnostic Uncertainty + Novel Disease State

Antibiotics for Bacterial Pneumonia in Patients with Confirmed COVID-19

Respiratory viral panels

Sputum cultures, bronchoscopies

Within 7d of admission

Total

Internal data, UMMC ASCOT
Antimicrobial Use (AU) during COVID-19

3.5% Acute bacterial co-infection in COVID-19

14.3% Secondary bacterial infection in COVID-19

72% Patients received antibiotic therapy

74% Antibiotics prescribed were fluoroquinolones & third-generation cephalosporins

International Severe Acute Respiratory and Emerging Infections Consortium (ISARIC) COVID-19 Report: 08 April 2020

- 10,363 individuals from 240 sites across 25 countries
- 62% received antibiotics, 74.5% among ICU patients
## Recommendations for Antibiotic Use in COVID-19

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Antimicrobial Recommendations</th>
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<tbody>
<tr>
<td>National Institutes of Health</td>
<td>- In patients with COVID-19 and severe or critical illness, there are insufficient data to recommend empiric broad-spectrum antimicrobial therapy in the absence of another indication. (BIII)</td>
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<td>- If initiated they should be reassessed daily in order to minimize adverse consequences. (AIII)</td>
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<td>World Health Organization</td>
<td>- Mild COVID-19: Recommend against antibiotics</td>
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<td>- Moderate COVID-19: Recommend against antibiotics, unless there is clinical suspicion of a bacterial infection</td>
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<td>- Severe COVID-19: Recommend empiric antimicrobials to treat all likely pathogens, should be targeted to host factors and local epidemiology, and assessed daily for de-escalation</td>
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<td>Surviving Sepsis Campaign: Guidelines on the management of critically ill adults with COVID-19</td>
<td>In mechanically ventilated patients with resp. failure, suggest use of empiric antimicrobials/antibacterial agents, over no antimicrobials (weak rec., low-quality evidence)</td>
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<td>- Re-evaluate for de-escalation daily</td>
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Local Experience – Personnel Shifts & Program Initiative Delays

Day-to-Day Stewardship Activities

- Prospective audit and feedback of restricted antimicrobials
- Other stewardship alerts (e.g., positive blood culture review)
- Development and maintenance of COVID-19 Therapeutic Guidelines
- Clinical trial involvement
- Allocation of remdesivir
- Review and approval of other high-cost novel therapeutics (e.g., tocilizumab)

Progress on Long-Term Goals

- Launch of new rapid technology for bloodstream infections in the microbiology laboratory
- Validation of susceptibility testing for novel antimicrobials and corresponding formulary reviews
- Monthly antimicrobial utilization reporting and annual antibiograms
- SARS-CoV-2 testing and reporting
- Shift to broad-spectrum, costly agents for PPE conservation
“Our usual tracking systems came to a halt. Extra hours went into treatment, active cases, clinical trials and EUA. There weren’t enough hours to catch up. Non-COVID initiatives came to a halt.”
Shift in Stewardship Resources

Antibiotic Days of Therapy/1000 Days Present

- **Meropenem**
- **Pip/tazo**
- **Cefepime**
- **Ceftriaxone**
- **Vancomycin**
- **Daptomycin**
- **Linezolid**
- **Ceftazidme**
- **Ciprofloxacin**
- **Levofloxacin**
- **Ertapenem**

**March 30, 2020**
- ASP PharmDs hours decreased by 30-50%

**May 25, 2020**
- Usual ASP PharmDs hours & responsibilities restored

Internal data c/o SIDP Member
The Opportunities
Leveraging Stewardship Experience in a Pandemic

- Development of treatment guidelines & enhancing compliance with recommendations
- Antimicrobial Optimization (e.g., IV-to-PO, shortened durations, antibiotic selection)
- Collaboration with Infection Prevention
- Diagnostic Stewardship, real time interpretation of test results
- Education and delegation
- Drug shortage and supply management
- Adverse Event Monitoring
- Clinical trials and tracking (e.g., eIND, IRB) for emergency use agents (e.g., remdesivir)
Peer Support Saves the Day
Two Stewardship Colleagues Contributing to National COVID-19 Treatment Guidelines

NIH Guideline:
- Susan Davis, PharmD, Wayne State University

IDSA Guideline:
- Jason Gallagher, PharmD, Temple University

“The public will demand [the drug and]...then will begin an era... of abuses....In such a case the thoughtless person playing with penicillin treatment is morally responsible for the death of the man who finally succumbs to infection with penicillin-resistant organism”
Acknowledgments

• University of Maryland Medical Center Antimicrobial Stewardship to Improve Clinical Outcomes Team

• Julie Ann Justo, PharmD, MS and other members of the Society of Infectious Diseases Pharmacists Board of Directors
• MMWR Vol 63 March 2014.
• JAMA 2016;316:2115-2125.
• https://www.covid19treatmentguidelines.nih.gov/
• Intensive Care Med. 2020;46(5):854-887.