Antimicrobial Resistance and COVID-19, what do we know so far?

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Learning Objectives

• Review of optimization of antibiotic use
• Describe processes affected by COVID-19
• Review the available evidence on bacterial infections and COVID-19
A brief review

**Figure 1**
Integrated approach to optimizing use of antimicrobials towards universal health coverage
What is happening during this pandemic?

- Many changes in healthcare systems
- Fear, anxiety from patients’ side
- Possible delays in presentation for care
- Changes in supply chains and regulations on export of medical products
- Availability of testing and surveillance
- Decreased access to personal protective equipment
In Summary

Source: WHO Practical toolkit Antimicrobial Stewardship Programmes in Health-Care Facilities in Low- and Middle-Income Countries
During the COVID-19 pandemic

- Supply Chain disruptions
  - Quarantined workers - Closed factories
  - Hardest hit areas - contributions to the antibiotic production

- Regulations
  - Travel restrictions/stay at home orders/curfews etc
  - Restrictions of movement of medical supplies/medicines
During the COVID-19 pandemic

- **Access**
  - Further restricted → out-of-pocket expenses, economic hardships, job losses
  - Public health facilities overwhelmed → purchasing ability decreases → funds

- **Immunizations**
  - Expanded immunizations programs halted
  - Redeployment of staff
  - Vaccine availability drops
During the COVID-19 pandemic

- **Surveillance**
  - Surveillance Programs → stop
  - Testing facilities and labs → repurposed for COVID-19
  - Some molecular testing → same reagents
  - Shortages in reagents, necessary tools etc
  - Human Resources

- **Infection Control and Prevention**
  - Isolation for MDRO stops
  - Lack of isolation supplies → PPE
  - Infection control practitioners → focus shifts towards pandemic
Understanding COVID-19 presentations

- CXR with multifocal opacities
- High fever
- Oxygen requirement
- Shock
- Progressive multi-organ failure

CXR images from twitter Radiology RSNA
Understanding COVID-19 presentations

• Increase in inflammatory markers: CRP, D-Dimer, LDH

• Increase in WBC count (lymphopenia common)

• The longer the hospital stay → increase risk of secondary bacterial infection
A quick review of the literature

- **Lancet:**
  - 191 patients from Wuhan
  - Hospitalized
  - Looking at risk factors and mortality

- SOFA score, D-dimer, lymphocyte count etc

- Secondary infection in 15% of patients but 95% received antibiotics
A quick review of the literature

- NEJM
  - 1099 patients from 3 provinces in China
  - 154 patients with severe disease
  - 58% received antibiotics
    - Culture data missing—hospitals overwhelmed

<table>
<thead>
<tr>
<th>Treatments</th>
<th>No. (%)</th>
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<tbody>
<tr>
<td>Intravenous antibiotics</td>
<td>637 (58.0)</td>
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<tr>
<td>Oseltamivir</td>
<td>393 (35.8)</td>
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Issues with the current COVID-19 literature

- Pandemic situation: no rigorous study designs

- Push for rapid publication - sometimes without proper peer-review

- Many articles - retrospective and very small sample sizes
  - Others with the same patients included in more than one study
Proposed way forward

- Concomitant Bacterial infections in COVID-19 patients → exception not the norm

- Critically-ill patients → cautious management

- Some of the proposed therapies for COVID-19 may predispose to secondary bacterial infections

- In patients presenting with shock → diagnostics to prove Bacterial infection + use pro-calcitonin if available

- → Discontinue antibacterials within 48 hours
References and additional readings


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