Antimicrobial Stewardship Backgrounder: Clostridium difficile Infection (CDI)

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Effective, Safe, and Sustainable Medication Use

What is Clostridium difficile?

• Spore-forming bacteria
• Causes diarrhea when normal intestinal flora is disrupted, e.g. antimicrobials
• CDI can result in serious complications:
  – pseudomembranous colitis
  – toxic megacolon
  – death

Vegetative form

60 preventable deaths in 2014 in AHS = attributable mortality rate of 3.4%

C. difficile in Alberta

The provincial rate of HA-CDI is 3.3 cases per 10,000 patient days.

Impact of C. difficile in Canada

Healthcare-associated CDI rate = 6.99 per 10,000 patient days (2011)

• 37,900 episodes in Canada in 2012
• 14-day increase in LOS
• Additional $12,000 in costs per CDI episode
⇒ Total costs of CDI $281 million
⇒ Total hospital costs $260 million
**CDI Risk Factors**

- Hospitalization
- Severe illness
- Bowel surgery
- Advanced age (> 65 years old)
- Acid suppressive therapy (PPIs and H2 blockers)
- Antibiotic therapy

**NO evidence to support use of metro or vanco as prophylaxis, or for continuing anti-CDI therapy, while patient is on a non-CDI antibiotic**

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**CDI & Acid suppressive therapy**

- Patients on PPIs:
  - 65% increase in CDI [RR 1.69; 95% CI 1.40-1.97, p<0.001]
  - Increased incidence of recurrence of CDI

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**CDI & Antibiotic therapy**

- Canadian cohort study:
  - Inpatients on antibiotics were 60% more likely to develop CDI
  - At the ward level, antibiotic use was the strongest predictor of CDI incidence
  - 10% increase in ward exposure to antibiotics → 1.34-fold increase in CDI incidence
  - Patients with and without direct recent antibiotic exposure

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**Antimicrobial Treatment of CDI**

- **Mild to Moderate Infection**
  - Failure to respond in 3-5 days, change to:
    - **Vancocin:** 125mg PO/QID for 10 days
  - Vancomycin 125mg PO/QID for 10 days
  - If fecal/PO: Vancomycin 500mg PO*** for 10 days PLUS Metronidazole 500mg IV q8h for 10 days

- **Severe Infection:** WBC > 15x10⁹/L, creatinine ≥ 1.5x baseline, hypotension, shock, megacolon

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**Oral Vancomycin Guidelines**

Oral vancomycin is used solely for the treatment of C. difficile infection and only if there is:

- Documented failure or clinical deterioration on metronidazole therapy
- Clinical relapse of C. difficile infection with symptoms after 2 courses of metronidazole therapy
- Severe C. difficile infection (defined as WBC > 15x10⁹/L, serum creatinine ≥ 1.5 times baseline, hypotension, or shock) or documented or impending toxic megacolon
- Intolerance or adverse effects of metronidazole therapy
CDI Order Sets in AHS/CH

<table>
<thead>
<tr>
<th>Order Set Name or Number</th>
<th>AHS Zone/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>C difficile (Clostridium difficile) Management</td>
<td>Calgary Zone</td>
</tr>
<tr>
<td>Red Deer - #19867</td>
<td>Central Zone</td>
</tr>
<tr>
<td>Adult – Form #18716</td>
<td>Edmonton Zone</td>
</tr>
<tr>
<td>Pediatric – Form #18719</td>
<td>North Zone</td>
</tr>
<tr>
<td>Form CV-0319</td>
<td>Covenant Health</td>
</tr>
</tbody>
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Why use CDI PPCO/order sets?

- Retrospective case-control study
  - 51.7% of patients’ prescribers followed the 2010 IDSA guidelines
  - Patients whose prescribers followed the IDSA guidelines experienced fewer complications (17.2% vs. 56.3%, P<0.0001)
  - ↓ mortality (5.4% vs 21.8%, P = 0.0012)
  - ↓ CDI recurrence (14% vs 35.6%, P = 0.0007)
  - Patients who presented with severe & complicated disease received guideline-based therapy significantly less often than patients with mild disease (19.7%, 35.3%, and 81.2%, respectively, P <.0001)

Summary

Guideline concordant therapy for CDI improves patient outcomes, including recurrences and mortality


AHS Insite

AHS External ASP website

With Thanks…

- Dr. Uma Chandran
  Associate Medical Director, Infection Prevention & Control, RAH/GRH
- DUAP
References


Questions?