Clostridium difficile and MDROs: Mission Impossible?

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Guideline recommendations: Epidemiology

- **CDI cases defined**
  - Healthcare facility-onset (HO) CDI
  - Community-onset, healthcare facility-associated (CO-HCFA) CDI
  - Community-associated (CA) CDI

- **CDI incidence and rates**
  - HO-CDI number of cases per 10,000 patient days
  - CO-HCFA prevalence number cases per 1000 patient admissions

- Pediatric institutions same standardized case definitions and rate expressions
Major differences?

- Epidemiology, diagnosis, treatment, prevention CDI

- Test ONLY new-onset, unexplained, clinically significant diarrhea (≥ 3 unformed stools in 24 hours)

- 10-day course (PO) Vancomycin as first line

- Probiotics and fecal microbiota transplantation (FMT)
Diagnosis of CDI

- **Molecular tests [NAATs]**
  - Nucleic acid amplification tests (i.e. polymerase chain reaction-PCR)
  - These do not differentiate colonization versus infection

- **Limit testing patients:**
  - *Do NOT test formed stools*
  - No specimens after laxatives
  - Do not retest within 7 days of previous negative

- **Children >2 years:**
  - test if prolonged or worsening diarrhea + risk factors
  - relevant exposures

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Treatment recommendations for children

- Metronidazole for initial/first recurrence mild/moderate CDI

- Vancomycin preferred for multiply recurrent and/or severe CDI

- Phase 3 investigations underway for Fidaxomicin

- FMT can be considered with multiply recurrent CDI
Infection Prevention and Control

- Private room with dedicated toilet
- Individual bedside commode
- HCW (healthcare workers) **must:**
  - gloves and gowns room entry
  - while providing care for CDI patients
ISOLATION: Standard Precautions plus contact precautions

- Implement *contact precautions* with suspect patients

- Continue precautions 48 hours AFTER diarrhea resolved

- IF rates remain high despite precautions, keep patients in isolation until discharge
Importance of Hand Hygiene (HH)

- Perform before/after contact with patient
- Perform after glove removal
  - Can use soap and water
  - Can use alcohol-based hand hygiene product (ABHR-alcohol based hand rub)
- CDI outbreak or sustained high rates of infection (hyper endemic)
  - Should use soap and water (not ABHR)
- Soap and water is preferred:
  - if direct contact with feces
  - area where fecal contamination is likely
Patient Care

- Teach patients:
  - Wash hands often and before leaving room
  - Shower to reduce spores on skin
- Include family/visitors in HH practices
- Acknowledge survival times of *C. difficile*
Equipment and Environment

- Disposable patient equipment

- Single use (b/p cuff and sphygmomanometer, stethoscope, thermometer) items

- Reusable equipment and room/furniture must be cleaned then disinfected (use sporicidal disinfectant)

- During outbreaks or hyper endemic, clean room daily with sporicidal disinfectant
Environmental Disinfection

- IP and EVS incorporate measures for evaluating effectiveness
- Automated disinfection with sporicidal
- No evidence for airborne transmission
Asymptomatic carriers...

- There are insufficient data to recommend screening for asymptomatic carriage and placing asymptomatic carriers on contact precautions (*no recommendation*).

- What is the risk of transmission by asymptomatic carriers? Surveillance testing, or “test of cure,” should NOT be done on asymptomatic carriers.

- Guide to the elimination of *Clostridium difficile* in healthcare settings, APIC elimination guide, 2008: 59
Other treatment comments

- Insufficient data of probiotics as primary
- If ileus, vancomycin per rectum is an option
- Surgical management, subtotal colectomy
  - Preservation of rectum
  - Diverting loop ileostomy
  - Colonic lavage with antegrade vancomycin flushes

Specific regimen for (PO) vancomycin with recurrence

Additional options if >1 recurrence

- FMT recommended multiple recurrences of failed treatments
Key Concepts

- Patient susceptibility to *Clostridium difficile* infection (CDI) requires prior antimicrobial treatment.
- Healthcare personnel transmit *C. difficile* on their hands.
- *C. difficile* spores may contaminate the healthcare environment.
- Patients asymptomatically colonized with *C. difficile* are at reduced risk of infection.
- Barrier precautions can be used to prevent *C. difficile* from reaching the patient.
- Thorough environmental cleaning reduces spore contamination and CDI incidence.
- Effective antimicrobial stewardship can significantly reduce CDI rates.

APIC text online, Chapter 72  CDI and Pseudomembranous colitis
MDROs: an alphabet

- MRSA  Methicillin Resistant *Staphylococcus aureus*
- VRSA, VISA  vancomycin-resistant and vancomycin intermediate-resistance *Staphylococcus aureus*
- VRE  Vancomycin Resistant *Enterococcus*
- ESBL  extended spectrum beta-lactamase resistance (gram negative bacteria - GNB)
- MDR-*Pseudomonas aeruginosa* and *Acinetobacter baumannii*
- CRE  Carbapenemase Resistant *Enterobacteriaceae*
- CDI  *Clostridium difficile* infection
Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006

- Centers for Disease Control and Epidemiology, CDC:
  - document major focus range of resistance in multiple healthcare facility settings

- Document revision was completed February 15, 2017.

- https://www.cdc.gov/infectioncontrol/guidelines/mdro/
Epidemiology of MDROs

- MRSA first isolated in US 1968
- VRE emerged in eastern US early 1990s
- Clinical infection low in LTCF (long term care facility) but can cause serious disease and mortality
- Selective pressure, increased MRSA colonization/infection, inadequate infection control practices
Pediatric infections

- ≤4% patients in PICU/NICU with MRSA
- 10-24% patients colonized with GNB (gram negative bacilli)
General recommendations

- Administrative Measures
- Education and Training of HCW
- Appropriate antimicrobial agent use
- Surveillance
- Infection Control
- Contact Precautions
- Long Term Care, Ambulatory Care, Hemodialysis and in-home care settings
- Environmental Measures
- Intensified interventions
How to understand and implement

- CDC infection control assessment review
- Multidisciplinary processes
- Data analysis from laboratory
- Communication of data findings
Ethical considerations for MDRO carrier

- Health inequity carrier excluded from medical treatments/delay in care
- Social injustice excluded from (benefits of) going to work
- Asymptomatic carriers may not have a health effect
- Outbreak management
  - Quarantine
  - Isolation
  - Social distancing measures

Ethical considerations (continued)

- Non-defining factor in slowly evolving threat
  - Long-term clinical effect may be high
  - Restrictions role leads to control???
  - Immediate threat limited
Applicability

- Effect of policy/guideline on staff
- Purpose of facility policy/protocol
- Common sense
- WATP
References

