A risk-stratified algorithm for treating CDI

Kirthana Raman, PharmD
Department of Pharmacy, Tufts University School of Medicine

_Clostridium difficile_ infection (CDI) is a common hospital-acquired infection that has a significant morbidity, mortality, and financial burden on our healthcare system [1,3]. Epidemiologic surveillance suggests that 0.5-1.5% of hospitalized patients develop CDI; however these estimates are conservative, as the estimates are almost a decade old and the incidence of CDI is on the rise. Furthermore, this disease only became a reportable condition as of 2013, and historical surveillance studies may be subject to under-reporting bias [3,4]. The burden of CDI exists not only in its incidence as approximately 20% of initial cases will experience a recurrence [5, 7]. As the Centers for Medicare and Medicaid Services begin to withhold payment for readmissions, readmission for CDI (primary or recurrent) can have significant financial implications to hospitals, depending on the index admission diagnosis. To mitigate the clinical and financial risks associated with this condition and its recurrences, a risk-stratified CDI treatment algorithm was developed at Tufts Medical Center (Figure 1).

The Tufts Medical Center CDI Treatment Algorithm was developed by a multidisciplinary group of physicians, pharmacists, and microbiologists. There were representatives from various medical and surgical disciplines, including infectious diseases, hematology / oncology, and critical care. This team incorporated consensus guidelines, published literature, clinical expertise, and internal research data to substantiate their recommendations [1, 2, 8].

The development of this algorithm has met with several barriers. Although consensus guidelines have been published recently, the recommendations within them are based on antiquated data [1, 9, 10]. Given the frequency with which CDI occurs and the evolving nature of this condition, there is a paucity of contemporary prospective, randomized, controlled data, with a heavy dependence on expert opinion. The decision to utilize vancomycin over metronidazole for severe disease is based on recent reliable evidence[11]. However, treatment options for other clinical scenarios like toxic megacolon, ileus, or hemodynamic instability have only been assessed retrospectively and published in case reports [12, 13].

**Assimilating new approaches**

Financial constraints have impacted the decision to use new high-cost agents, like fidaxomicin. With fidaxomicin’s potential to reduce the risk of recurrence and the looming financial penalty of readmission, the algorithm prudently incorporated this agent in the population at highest risk for recurrence [6]. Given its cost, the use of this agent will be closely monitored with prospective authorizations and retrospective evaluations to avoid misuse.

Stool transplantation is an innovative therapeutic option, and prospective data to support the beneficial outcomes of this procedure were recently published [14]. There are, however, some legal, clinical, and operational hurdles that must be overcome prior to successfully transplanting stool. In light of the new data supporting this procedure, its role at our institution will be assessed for future iterations of the Tufts CDI Treatment Algorithm.

Given the heterogeneity of CDI presentations, medical centers are encouraged to develop treatment algorithms for their practitioners that incorporate various patient-specific factors. There are multiple treatment modalities for CDI and unique clinical situations when each of those therapies may be most appropriate. Consideration should be provided to both medical and surgical options, as well as novel drugs (fidaxomicin tablets), delivery methods (vancomycin rectally), and biologics (stool transplant). Providing institutional guidance via a hospital algorithm may improve the quality of care consistently and systematically.

---

Source: The APUA Newsletter Vol. 31. No. 1 • © 2013 APUA • www.apua.org
**CLOSTRIDIUM DIFFICILE TREATMENT ALGORITHM**

***SEND STOOL FOR TOXIN IF CLINICAL CRITERIA FOR C. difficile INFECTION EXIST***

- >3 loose stools in past 24 hours **OR** ileus **AND** other causes of diarrhea were ruled out (stool softeners, recent oral contrast)

**STEP 1: CONTAIN AND PREVENT COMPLICATIONS**

- Initiate modified contact precautions
- Discontinue anti-motility agents
- Discontinue unnecessary concomitant antibiotics

**STEP 2: START EMPIRIC TREATMENT WHEN INDICATED**

- Severely ill (hemodynamic instability **OR** ileus **OR** toxic megacolon)
  
  **Oral vancomycin 500 mg every 6 hours with IV metronidazole 500 mg every 8 hours**

- Signs of ileus (decreasing stool output, absence of bowel sounds, ileus on imaging):
  
  **Add vancomycin PR 500 mg in 100 mL NS every 6 hours as a retention enema**

- Toxic megacolon **OR** hemodynamic instability:
  
  **Obtain urgent surgical consultation for consideration of colectomy**

- Not severely ill but **C. difficile** infection is **HIGHLY SUSPECTED**
  
  - **C. difficile** infection in past 12 months, age ≥70 years, OR creatinine clearance ≤60 mL/min: **Start oral fidaxomicin 200 mg every 12 hours (Call AMT for fidaxomicin approval)**
  
  - No history of **C. difficile** infection, acute onset of diarrhea in the hospital, AND WBC > 20,000 cells/μL or immunocompromise:
    
    **Start oral vancomycin 125 mg every 6 hours**

- **IN ALL OTHERS: DO NOT START EMPIRIC THERAPY UNTIL TOXIN RESULTS ARE KNOWN**

**STEP 3:**

- **TOXIN NEGATIVE: DO NOT TREAT AND STOP EMPIRIC THERAPY**

- **TOXIN POSITIVE: TREAT BASED ON SEVERITY AND RISK OF RECURRENT**

  - If severely ill (hemodynamic instability **OR** ileus **OR** toxic megacolon)
    
    **Continue oral vancomycin 500 mg every 6 hours with IV metronidazole 500 mg every 8 hours**

  - Signs of ileus (decreasing stool output, absence of bowel sounds, ileus on imaging):
    
    **Add vancomycin PR 500 mg in 100 mL NS every 6 hours as a retention enema**

  - Toxic megacolon **OR** hemodynamic instability:
    
    **Obtain urgent surgical consultation for consideration of colectomy**

  - **C. difficile** infection in past 12 months, age ≥70 years, OR creatinine clearance ≤60 mL/min:
    
    **Start oral fidaxomicin 200 mg every 12 hours (Call AMT for fidaxomicin approval)**

  - If no **C. difficile** infection in past 3 months and minimally symptomatic (diarrhea <5 episodes in past 24 hours AND minimal cramps AND WBC < 10,000 cells/μL):
    
    **Start oral metronidazole 500 mg every 8 hours**

  - In all other patients:
    
    **Start oral vancomycin 125 mg every 6 hours**

**IF HISTORY OF >2 EPISODES OF C. difficile INFECTION IN THE PAST 3 MONTHS OR IF THE PATIENT DETERIORATES DESPITE APPROPRIATE THERAPY: CONSULT INFECTIOUS DISEASES**
References


Source: The APUA Newsletter Vol. 31. No. 1 • © 2013 APUA • www.apua.org