

Clostridium Difficile Infection in Patients With Cancer

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Patients with cancer undergoing chemotherapy often have diarrhea, which may result from their treatment or *Clostridium difficile* infection (CDI). CDI diarrhea is an important diagnosis that can be missed if nurses are not vigilant in their assessments. Treatment for CDI diarrhea is different than that of chemotherapy- or radiation-induced diarrhea. If CDI diarrhea is not treated, it can become life threatening in some patients.

Patients undergoing chemotherapy and pelvic radiation often experience diarrhea, but some patients also will be at risk for *Clostridium difficile* infection (CDI) diarrhea. CDI diarrhea can cause complications ranging from dehydration to death; therefore, this type of diarrhea must be identified early in patients with cancer because of their weakened immune systems and difficulty with CDI's treatment.

Patient Scenario

A 66-year-old woman diagnosed with stage II breast cancer, J.C., was undergoing chemotherapy with dose-dense doxorubicin and cyclophosphamide. During recovery from her breast surgery, J.C. developed a wound infection and was placed on antibiotics. After completing her antibiotics, J.C. developed diarrhea, which was confirmed to be CDI. She was treated successfully with oral metronidazole. During her second cycle of chemotherapy, J.C. called the triage nurse, stating she was having severe, watery diarrhea, cramps, and odorous stools. Not realizing her history of CDI diarrhea, a physician placed her on loperamide and instructed her to call if it was not effective.

Etiology

CDI is a gram-positive anaerobic bacterium that produces endotoxins A and B (Hall, 2010) (see Figure 1). These toxins

are responsible for epithelial damage to the colon, which causes diarrhea. Antibiotic use is generally the most common predisposing factor because it disrupts the normal flora of the intestinal tract, which becomes overgrown with CDI bacteria (Centers for Disease Control and Prevention [CDC], 2011). CDI diarrhea may begin while patients are on antibiotics or soon after but it can be latent for as many as eight weeks. CDI diarrhea can be mild, moderate, or severe (see Figure 2). Chemotherapy- or radiation-induced diarrhea can be severe and cause hospitalization but rarely results in surgery and/or death, as can be seen in CDI diarrhea. A new CDI strain recently was discovered, Bi/NAP1/027, which produces higher levels of toxins A and B (Gerding, Friedenberg, Nicolau, & Ochoa, 2009). This more virulent infection is associated with higher death rates and resistance to fluoroquinolones (McQuaid, 2007). It is common in hospitals, even during short stays; it also may be found in long-term facilities. The annual hospital cost of CDI diarrhea in the United States is estimated at \$3.2 billion (Gerding et al., 2009). The actual cost in



Figure 1. *Clostridium Difficile*

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patients with cancer is unknown. CDI does appear to be on the rise; rates have doubled, from 6.4 to 13.1 cases per 10,000 in incidence from 2000–2005 (Gerding et al., 2009). Unfortunately, CDI is shed in feces and transmitted on the hands of healthcare workers. It can be viable for up to 40 days if transmitted to rails and room equipment (Hooker, 2007).

Besides antibiotic use, risk factors include recent hospitalizations,

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