C. Diff—What's It To You?

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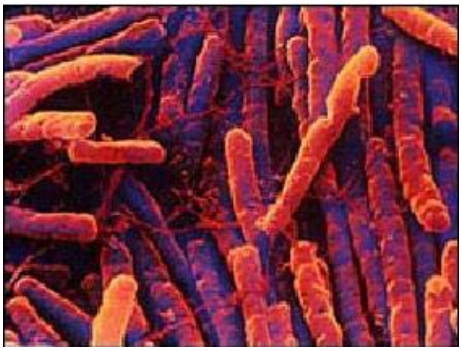
Objectives:

Describe C-Diff

Discuss the transmission of C-Diff

Describe the actions of healthcare facilities in response

We have all heard of Clostridium Difficile or C-Diff as we commonly hear it being used in our healthcare facilities. What exactly is C-Diff? The definition from the CDC says it is a spore-forming, gram positive anaerobic (can grow without oxygen) bacillus (bacteria) that produces two exotoxins (a potent toxin formed and excreted by the bacterial cell, and free in the surrounding cells): toxin A and toxin B. It is a common cause of antibiotic-associated diarrhea (AAD) and it is responsible for up to 25 % of all antibiotic-associated diarrhea. In other words, it a bacteria that lives in the large colon and causes anything from terrible diarrhea to life threatening inflammation of the colon.



There are half a million cases of *C. difficile* in the US each year, up from 150, 000 cases in 2001. The infection may be responsible for as many as 30,000 US deaths each year. The number may be higher as it is not yet a reportable disease. Hands and surfaces contaminated with feces spread the disease. Recent outbreaks of an epidemic strain indicate increased virulence and antibiotic resistance. More people are affected by the disease, and more are showing severe symptoms. Like MRSA, *C. difficile* is now being seen in what used to be considered "low risk" populations - healthy people in the community (CA-CDI) and pregnant women. The mortality rates have risen from 6 deaths per million in 1999 to 24 deaths per million in 2004. Long term care facilities are particularly vulnerable and it is important for the general public to know that infections can occur from contact with contaminated environmental surfaces. C. *difficile* infection represents one of the most common hospital (nosocomial) infections around the world. In the United States alone, it causes approximately three million cases of diarrhea and colitis per year. This bacterium is primarily acquired in hospitals and chronic care facilities following antibiotic therapy covering a wide variety of bacteria (broad-spectrum) and is the most frequent cause of outbreaks of diarrhea in hospitalized patients.

An important characteristic of C. *difficile*-associated diarrhea and colitis is its high prevalence among hospitalized patients. Thus, C. *difficile* contributes significantly to hospital length of stay, and may be associated in some elderly adults with chronic diarrhea, and occasionally other serious or potentially life-threatening consequences. One study demonstrated that 20% of patients admitted to a hospital for various reasons were either positive for C. *difficile* on admission or acquired the microorganism during hospitalization. Interestingly, only one-third of these patients developed diarrhea while the remainder were asymptomatic carriers serving as a reservoir of C. *difficile* infection. The organism and its spores were also demonstrated in the hospital environment, including toilets, telephones, stethoscopes, and hands of healthcare personnel. Individuals with C. *difficile*-associated disease shed spores in the stool that can be spread from person to person. Spores can survive up to 70 days in the environment and can be transported on the hands and equipment of healthcare personnel who have direct contact with infected patients or with environmental surfaces (floors, bed frames, bedpans, toilets, etc.)

.It is for this reason that thorough, terminal housekeeping procedures along with isolation practices be used to help control the spread of this organism. While patient-to-patient spread and environmental contamination can be some of the reasons of cross-infection in C. *difficile*-associated diarrhea and colitis, antibiotic therapy is the major risk factor for this disease. Thus, antibiotic use only when necessary is the most effective measure of preventing C. *difficile* infection .

Most cases develop 4 to 9 days after the beginning of antibiotic intake. It should be noted, however, that some patients develop diarrhea after antibiotics are discontinued and this may lead to diagnostic confusion.

Therapy of C. *difficile* is directed against eradication of the microorganism from the colonic micro flora. No therapy is required for asymptomatic carriers. In non-complicated patients with mild diarrhea, no fever, and modest lower abdominal pain, discontinuation of antibiotics (if possible) is often enough to alleviate symptoms and stop diarrhea. When severe diarrhea is present and in cases of established colitis, the patients should receive the antibiotics, *metronidazole* or *vancomycin*, for 10 to 14 days. Several clinical trials have shown that these antibiotics are equally effective in cases of mild to moderate C. *difficile* infection and more than 95% of patients respond very well to this treatment. Diarrhea following treatment with either vancomycin or metronidazole is expected to improve after 1 to 4 days with complete resolution within 2 weeks. However, some patients do not respond despite aggressive medical therapy and require surgical intervention. Although C. *difficile* infection usually responds well to treatment with metronidazole or vancomycin (strong antibiotics) approximately 15 to 20% of patients will experience re-appearance of diarrhea and other symptoms weeks or even months after initial therapy has been discontinued. The usual therapy for relapse is to repeat the 10 to 14 day course of either metronidazole or vancomycin and this is successful in most patients.

Strict adherence to hand washing techniques and the proper the use of personal protective equipment such as gloves and gowns and the proper handling of contaminated wastes when performing patient care are effective in preventing the spread of the disease. Because alcohol does not kill C-Diff spores, use of soap and water is more effective than alcohol-based hand rubs. However, because C-Diff is a spore, it is much more difficult to remove or inactivate than another bacterial spore.

Because of the ease in spreading C-Diff, it is imperative an adequate cleaning and disinfection protocol be set up. Frequent, thorough terminal decontamination practices of frequently touched environmental surfaces and floors with an EPA registered disinfectant with a sporicidal claim help provide significant control of the spread. Remember, standard EPA registered hospital disinfectants are not effective against C-Diff. The more effective disinfectant is hypochlorite-based if you do not have any of the EPA disinfectant available. If you are disinfecting colonoscopes or other endoscopes please follow manufacturer's directions in the process of cleaning and disinfection. Surfaces should be kept clean and body substance spills should be promptly managed by using the CDC's "Guidelines for Environmental Infection Control in Health-Care Facilities." We must all do our part to prevent the spread of C. Difficile.

Taken from CDC website, Mayo Clinic, Medicine.net

C. Diff —Winter 2012

Post-Test

1. C-Diff is a spore-forming, gram positive anaerobic (can grow without oxygen) bacillus (bacteria) that produces two exotoxins.

   True False

2. Exotoxins are friendly toxins formed and excreted by the bacterial cell, and free in the surrounding cells.

   True False

3. The infection may be responsible for as many as 30,000 US deaths each year.

   True False

4. C. *difficile* infection represents one of the most common hosp. (nosocomial) infections around the world.

   True False

5. C. *difficile* contributes to hospital length of stay, and may be associated in some elderly adults with chronic diarrhea, and occasionally other serious or potentially life-threatening consequences.

   True False

6. The organism's spores were not found in the hospital environment, including toilets, telephones, stethoscopes, and hands of healthcare personnel.

   True False

7. Spores can survive up to 70 days in the environment and can be transported on the hands and equipment of healthcare personnel.

   True False

8. Strict adherence to hand washing techniques and the proper the use of personal protective equipment such as gloves and gowns and the proper handling of contaminated items when performing patient care are not effective in preventing the spread of the disease.

   True False

9. Antibiotic therapy is the major risk factor for this disease.

   True False

10. Remember, standard EPA registered hospital disinfectants are effective against C-Diff.

    True False

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