

C. difficile Infection

BASICS OVERVIEW

Diarrhea is a frequent side effect of antibiotics, occurring 10 – 20% of the time. We presume it is a result of a change in the colonic bacteria and how they metabolize carbohydrates. Clostridium difficile infection (CDI) is due to a toxin producing bacteria that causes a more severe form of antibiotic diarrhea. The spectrum of disease ranges from mild diarrhea to severe colon inflammation that can even be fatal. CDI usually occurs when people have taken antibiotics that change the normal colon bacteria allowing the C. difficile bacteria to grow and produce its toxins. Since 2000, there has been a dramatic increase in the number and severity of cases of C. difficile infection (CDI).

SYMPTOMS

Symptoms of CDI can vary. Some people are asymptomatic carriers. Diarrhea is the most common symptom; it is usually watery and rarely bloody and may be associated with crampy abdominal pain. Associated symptoms are feeling poorly, fever, nausea and vomiting. Signs of severe disease include fever and abdominal tenderness.

CAUSES

C. difficile is a gram positive bacterium. This bacterium is ubiquitous in the environment, and produces spores that are hard to eradicate. The bacteria produce two main toxins - toxins A and B - that cause inflammation in the colon.

RISK FACTORS

The major risk factor for CDI is taking antibiotics in the previous several weeks, but sometimes it occurs even without prior antibiotic use. High risk antibiotics are clindamycin, cephalosporins, ampicillin, amoxicillin and quinolones (i.e. ciprofloxacin, levofloxacin). The organism is transmitted by fecal oral route. Major risk factors are being older, having other illnesses, being in a hospital or a long-term care facility. Underlying inflammatory bowel disease (Crohn's disease or ulcerative colitis) is another risk factor for CDI. Many studies have also suggested that use of acid suppressive medications (proton pump inhibitors) may increase the risk of CDI. Individuals can pick up C. difficile by ingesting spores that are ubiquitous in the environment, especially in hospitals. Infected individuals excrete spores, and transmission among patients in hospital has been well documented. Wise antibiotic policies, by using narrow-spectrum agents where indicated and avoiding unnecessary use of broad-spectrum antibiotics, are key in the prevention of CDI. Environmental cleaning is important – especially hand washing with soap and water since alcohol gels do not inactivate spores. In hospital, everyone entering the room of a patient with CDI should wear a gown, gloves, and use disposable equipment.

SCREENING/DIAGNOSIS

C. difficile infection requires testing stools for presence of the organism in the stools, either using an enzyme immunoassay test or a test for the organism's DNA.

TREATMENT

First, it would be ideal to stop the antibiotic that incited the infection in the first place. This may not always be possible, however, as some infections like severe bone or heart infections need antibiotics for many weeks. If the symptoms are mild, metronidazole 500 mg three times a day for ten days is recommended. If one cannot tolerate metronidazole's side effects, or is early in pregnancy when it is contraindicated, alternate treatment is vancomycin 125 mg four times a day for ten days. If the patient does not get better after several days on metronidazole, a switch to vancomycin is recommended. Fidaxomicin is a new antibiotic that appears equivalent to vancomycin but is much more expensive.

Antidiarrheal drugs should never be used for CDI as slowing down an inflamed colon may result in a severe complication called toxic megacolon.

Patients with severe disease may not have diarrhea if their colon is very inflamed. They are usually very sick, with fever, severe abdominal pain and tenderness. In such cases oral vancomycin is the best choice. Sometimes intravenous metronidazole is added as well. Vancomycin pills are very expensive. Some pharmacies can prepare the intravenous form of vancomycin to be taken orally at a much lower cost.

In some patients, CDI is so severe that antibiotics are not effective. When this happens surgery to remove the colon may be needed to save the person's life.

While antibiotics are effective in treating most cases of CDI, the symptoms recur after the end of treatment in 10-20% of cases. This is called recurrent CDI and usually occurs 1 – 2 weeks after stopping treatment. After a recurrence, the chance of further recurrences goes up to 40-60%, perhaps because one is using an antibiotic to treat a disease caused by antibiotics. We presume that the colonic bacteria have not had a chance to recolonize. A common treatment is to give vancomycin in a pulsed regimen – taking it one day but then skipping a day, and increasing the number of days between doses. Perhaps this allows the normal bacteria to return on the "off antibiotic" days. The probiotic Saccharomyces boulardii can sometimes decrease recurrences when used with an antibiotic. The most effective treatment, however, is fecal microbiota transplant, also known as stool transplant. In studies, it has been effective in over 91% of patients who received the treatment, but no controlled trials have been performed yet.

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