Fact sheet for Health Care Professionals

Clostridioides difficile infection (CDI)

Clostridioides difficile (formerly known as *Clostridium difficile*) infection is a disease of the large intestine caused by toxins produced by the anaerobic, spore-forming bacterium *C. difficile*. It is believed that the trigger for infection usually is disturbance of the normal gut flora during antibiotic treatment. This allows ingested spores to colonise the intestine and produce toxins that attack the lining of the intestinal wall. Severity can range from mild, self-limiting diarrhoea to toxic megacolon and fulminant colitis. The latter has a high mortality rate if not recognised early and treated appropriately.

Recently, an epidemic, "hypervirulent" strain of *C. difficile* has emerged (known as the pulse field type NAP1 or ribotype 027 strain) which is associated with a more severe form of the disease, and appears to be highly transmissible, being responsible for large outbreaks of infection in the USA and Europe. Although there are other strains that may be classified as "hypervirulent", not all are associated with epidemic spread.[1] The 027 strain is also resistant to some fluoroquinolone antibiotics (moxifloxacin and gatifloxacin).

How is CDI diagnosed?

CDI should be suspected in any hospitalized patient who develops diarrhoea or in any patient with prolonged diarrhoea who has recently had antibiotics or immunosuppressive therapy. A diarrhoeal stool sample should be sent to the laboratory with a request for *C. difficile* testing. When ileus is present, a rectal swab is a suitable specimen.

The detection of *C. difficile* cytotoxin by cell culture, or culture for the organism in stool have been considered the gold standards for diagnosis. However, both tests are relatively slow (>48 hrs to result) and screening tests using EIA methods are often used. It should be noted that the sensitivity of these latter tests can be low. Recently, more sensitive PCR methods for detection of *C. difficile* toxins have become available; however not all laboratories currently have the capacity to perform them on a routine basis.[2] Confirmation of the presence of a "hypervirulent" strain requires culture of the organism and strain typing, which can take several days to weeks.

How is CDI treated?

CDI can be difficult to treat and is associated with a high relapse rate. For treatment of an initial episode and first recurrence, metronidazole (oral if tolerated, otherwise IV) is the preferred antibiotic with oral vancomycin or fidaxomicin reserved for severe disease and/or subsequent recurrences.[3] Alternative treatments such as probiotics are of unproven effectiveness, although evidence for the effectiveness of faecal microbiota "transplants" in selected patients is increasing.

Who is at risk**?**

Those most at risk of developing CDI are the elderly, the immune compromised and those receiving antibiotic treatment for other infections. However, an increasing proportion of community acquired CDI cases overseas have no history of antibiotic use. Although this disease was first described as a consequence of clindamycin treatment, most antibiotic classes have now been implicated as risk factors for CDI, especially fluoroquinolones and cephalosporins. Asymptomatic carriage is common in young children, but much less common in adults.

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How is *C. difficile* spread?

The main source of transmission is patients with symptomatic CDI. These patients shed large numbers of spores in faeces, resulting in widespread contamination of their skin, bed linen and nearby environmental surfaces. These spores are resistant to drying and the usual chemical cleaning agents and can therefore remain in the environment for extended periods of time. Spores can then be picked up on the hands of patients and healthcare workers.

What are the infection prevention measures?

The most important measure to prevent the emergence of "hypervirulent" *C. difficile* strains in Australia is antibiotic stewardship, with a particular focus on reducing the unnecessary usage of fluoroquinolones and third generation cephalosporins.

The most important transmission prevention measures are thorough environmental hygiene with a chemical disinfectant that is sporicidal (e.g. buffered sodium hypochlorite, chlorine dioxide or activated hydrogen peroxide) and meticulous hand hygiene by health care workers, patients and visitors.[4] It is also very important that contact precautions are put in place for any patient with diarrhoea at the time of symptom onset.

How long should infection control precautions be in place?

Contact precautions should be in place until either:

1. the cause of the diarrhoea has been proven not to be infectious,

or

2. the diarrhoeal symptoms have completely resolved.

Are alcohol-based hand rubs effective for hand hygiene?

This is a controversial area since, theoretically, alcohol solutions are only active against vegetative organisms and not spores. However, recent consensus is that the use of gloves as part of contact precautions should prevent the contamination of hands with spores, and alcohol-based hand rubs can still be used on removal of gloves. However, if there has been any unprotected exposure (e.g. touching the patient or their environment without gloves on) or direct soiling of the hands, then thorough washing with soap and water should be performed.

References

1. Lessa FC, Gould CV, McDonald LC. Current status of *Clostridium difficile* infection epidemiology. CID 2012; 55(S2):S65-70.
2. Burnham C-A D, Carroll KC. Diagnosis of *Clostridium difficile* infection: an ongoing conundrum for clinicians and for clinical laboratories. CMR 2013; 26(3): 604-630.
3. Australasian Society for Infectious Diseases guidelines for the diagnosis and treatment of *Clostridium difficile* infection. MJA 2011; 194(7): 353-358.
4. ASID/AICA Position Statement: Infection Control Guidelines for patients with *Clostridium difficile* infection in healthcare settings. Healthcare Infection 2011; 16: 33-39.

For more information

Infection Control Service
Communicable Disease Control Branch
Telephone: 1300 232 272
www.sahealth.sa.gov.au/infectionprevention

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