Changing epidemiology of *Clostridium difficile*–associated infections

Clostridium difficile infection continues to be a common cause of health care–associated diarrhea in North America, contributing to patient morbidity and mortality. *C. difficile* is a gram-positive, spore-forming, anaerobic bacteria that spreads via the fecal-oral route from person to person. Its pathogenicity is based on the production of toxins and, in some strains (e.g., NAP-1 strain), an overproduction of toxins. Manifestation of *C. difficile* is characterized by diarrhea, fever, nausea, and abdominal pain, and in severe cases progresses to toxic megacolon, sepsis, and death. As well, reduced susceptibility to metronidazole is emerging, and this complicates treatment. Those who are immunosuppressed and those over 65 years of age have increased risk of complications and death. Children were traditionally thought to be asymptomatic carriers of the organism; however, children between the ages of 1 and 18 years are affected by *C. difficile*.[1]

It is important to understand the changing epidemiology of *C. difficile* to understand diagnosis and guide infection prevention and control practices. According to the Provincial Infection Control Network of British Columbia (PICNet), the provincial rate of *C. difficile* has decreased by more than 50%, from 8.6 per 10 000 inpatient days in 2009–10 to 4.2 per 10 000 inpatient days in 2014–15. Among the 2014–15 cases, however, close to 30% were community-associated, which is double the number of those cases in 2009–10.[2] This increase in incidence of community-associated *C. difficile* has been reported across Europe and North America and is occurring in patients who are younger, healthier, and with fewer risk factors. A recent report showed a shift in strain types in a region in BC from a highly virulent strain associated with health care–associated *C. difficile* in 2008 to novel strain types in 2013.[3] These novel strain types identified in the health care setting in 2013 were seen in the community setting within this region in 2008, suggesting that *C. difficile* strains from the community setting were likely introduced into health care facilities where they contributed to circulating health care–associated strains. Using whole genome sequencing, a group in the UK demonstrated that there are numerous sources for *C. difficile* acquisition, including colonization in the community prior to admission to hospital.

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Currently, there is very limited information on potential environmental sources of *C. difficile*. However, *C. difficile* can be recovered from retail meats and vegetables. Colonization by household pets has also been reported.[4]

Although little is known of where and how *C. difficile* is acquired, it is well known that alteration of the normal enteric flora, especially from unnecessary use of antibiotics, is an important risk factor. Two of the main challenges in *C. difficile* are relapse and recurrence of disease. Predisposing factors for relapse include insufficient length of treatment, inadequate doses of oral agents (commonly metronidazole), or both. It is important to note that almost 30% of cases were reported as recurrent in 2012.[1] In many of these cases, conventional antibiotic treatments have had limited success and patients suffer repeated episodes. Proper choice and dosing of antibiotics according to recommended guidelines are important stewardship practices. Patients should be counseled to adhere to treatment regimens and to complete the prescribed course. Recently, stool transplantation has provided a safe and effective alternative to antibiotic treatment for patients with recurrent CDI. A guide for best practice management is available at www.picnet.ca/wp-content/uploads/Toolkit-for-Management-of-CDI-in-Acute-Care-Settings-2013.pdf.

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References

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