Control of Clostridium difficile-associated diarrhea by antibiotic stewardship in a small community hospital

To the editor:

Clostridium difficile-associated diarrhea (CDAD) is an important nosocomial infection in Canadian hospitals and an emerging public health problem. CDAD causes significant morbidity and can be associated with high all-cause mortality (1). Recent Ontario guidelines have emphasized housekeeping and case-management strategies to control CDAD (2). Although antibiotic stewardship has been suggested by many experts as useful in CDAD control (3-5), this strategy has not been included in the Ontario recommendations. We describe a persistent outbreak of CDAD in a small hospital that appears to have been controlled by a simple antibiotic stewardship program.

Campbellford Memorial Hospital (CMH) is a small (34 bed) community hospital in rural eastern Ontario. CMH does not perform dialysis or operate a true intensive care unit (ie, no ventilators or invasive hemodynamic monitoring). Patient care areas were built in 1953, most rooms have shared toilets and occupancy rates were close to 100% throughout the outbreak period.

Before April 2007, CMH experienced sporadic incident nosocomial cases of CDAD (frequent loose stools and stool positive for C difficile toxin with either onset of symptoms >72 h after hospital admission or a history of hospital admission within the previous four weeks) (6). The average infection rate was 0.3/1000 patient days (approximately one case every three months) over the 21 months before April 2007. Beginning in April 2007, CMH experienced much higher rates of incident nosocomial CDAD. Over a 15-month period (April 2007 to June 2008), CMH had 49 incident nosocomial cases of CDAD with an average infection rate of 3.2/1000 patient days (Figure 1). This was a very high rate compared with other Ontario hospitals (average Ontario CDAD infection rate in August 2008 was 0.39/1000 patient days/month) (7). Forty-seven cases (88%) had a history of hospital antibiotic use, and 35 (71%) fluoroquinolone use and 28 (57%) moxifloxacin use.

CMH followed expert advice and implemented a series of housekeeping and patient management measures without controlling the outbreak (Table 1). On June 17, 2008 the CMH instituted several additional measures. These included double cleaning of CDAD patient rooms seven days a week (previously five days a week), disposable bedpans for CDAD cases and an antibiotic stewardship program. The latter consisted of two elements. First, memos were sent to physicians and notices were posted requesting that they avoid the use of fluoroquinolones for inpatients. There was special emphasis on reducing moxifloxacin use because of the particularly strong association with this antibiotic (8). Second, all orders for moxifloxacin for inpatients were automatically reviewed by the hospital pharmacist and consultant internist, and alternative antibiotics recommended to the most responsible physician (9).

The use of moxifloxacin declined from an average of 87 doses per month during the 14 months of the outbreak to an average of 12 doses per month—an 87% decrease—in the first six months after implementation of the antibiotic stewardship program. CMH has had one incident case of nosocomial CDAD in 21 months before April 2007 and five incident cases of CDAD over 12 months from June 17, 2008 until July, 2010. This was a significant decrease in the CDAD rate from 3.2/1000 patient days/month (before implementation of antibiotic stewardship) to 0.24/1000 patient days/month (over the 24 months with antibiotic stewardship) (incidence rate ratio associated with the intervention 0.013 [95% CI 0.018 to 0.093]; P<0.0001 [χ2 test]). CMH’s simple antibiotic stewardship program was effective at changing antibiotic use and may have played a decisive role in ending a persistent CDAD outbreak. Additional environmental measures, adopted at the same time as antibiotic stewardship, may have also contributed. Antibiotic stewardship deserves more attention as a CDAD control strategy. A particularly strong link between moxifloxacin and CDAD has been proposed by other observers (8). This association could be related to moxifloxacin’s activity against anaerobes, unique among the currently available fluoroquinolones (10). The apparent association between CDAD and moxifloxacin use deserves further investigation.

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REFERENCES

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