

What's up With *Clostridium difficile* Infection Now?

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Recent report from Center for Diseases Control and Prevention (CDC), based on an analysis of 10,342 cases of CDI in 111 hospitals and 310 nursing homes, showed that 75% of patients were already colonized with *C. difficile* at the time of admission (1). Nearly all (94%) of these cases were "healthcare-associated", meaning that acquisition occurred during an outpatient visit, a nursing home stay, the current hospitalization, or previous hospitalization. Only 25% of patients actually acquired the pathogen in the same hospital where clinical expression of CDI occurred. In fact, it means that the *Clostridium difficile* Infection is a hospital acquired infection.

The CDC study suggests that infection control personnel and physicians need to be aware of this association, because this may require changes in infection control practice. The implication is that to prevent CDI, clinicians need to find ways to identify patients who are already colonized to protect them from obvious risks, and also to consider them to be potential sources of infection to others. This could substantially change infection control practice for prevention of CDI. First drug which is approved by the US food and Drug Administration (FDA) for the treatment of CDI is oral Vancomycin (2). Fidaxomicin is the second drug approved by FDA which was compared with Vancomycin in 1200 patients who randomly assigned (3, 4). Results showed similar initial response rates (88% vs. 86%), but a significantly reduced rate of relapse in Fidaxomicin recipients (15% vs. 25%) (3). A subsequent trial showed that Fidaxomicin was also superior to Vancomycin in prevention of second relapse in patient who had already experienced a relapse of CDI (36% vs. 20%) (5). It appears that Fidaxomicin is a good drug for CDI because it is FDA approved; similar to oral Vancomycin with respect to cure rates; and clearly superior in terms of "global cure" rates which include initial responses without relapse. As

we known, the cost of Fidaxomicin is expensive and mostly unavailable in resource limited countries.

It has long been claimed that nurses can identify patients with CDI by the odor in an infected patient's room or the odor of the stool although this has not been verified in clinical trial (6). Because dogs have an olfactory sense that is approximately 300 times that of humans, investigators in the Netherlands trained a beagle to detect odor of p-cresol (a phenolic compound that results from the fermentation of tyrosine), which is thought to be the source of the odor of *C. difficile* (7). The dog was thought to sit if the specimen was positive. The beagle's performance in a trial was near perfect. Compared with results of clinical and laboratory studies for *C. difficile* the dog recognized positive cases in 30 of 30 instances of CDI and identified negative test of 270 of 270 specimens from patient without CDI. In fact, the dog was even able to recognize a case by exposure to the patients ward in 25 of 30 cases (83%) and correctly eliminated CDI by the ward walk-through in 265 of 270 negative cases.

A new surgical procedure for CDI has been developed: diverting loop ileostomy with colonic Vancomycin lavage. The surgical experience with CDI has previously consisted of colectomy in patients who are critically ill, often with toxin megacolon. Mortality rates are high, and surviving patients suffer the consequences of living without a colon. Surgeons at the University of Pittsburgh had extensive experience in the midst of CDI, consisting of diverting ileostomy in place of colectomy. A retrospective comparison of 42 patients who underwent the new procedure for refractory CDI showed mortality rates of 19% vs. 50% favoring the new procedure (8). We hope that diverting loop ileostomy procedure will replace colectomy as the standard surgical procedure for most patients with severe CDI who require surgery. The last option for

treatment of refractory and recurrent CDI is stool transplantation, which was discussed earlier in our editorial. In fact the stool transplantation had 92% success rate in 312 patient treated across 27 case series, in addition it was showed that Intestinal Microbiota Transplantation is highly effective (9).

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