Clostridium Difficile Infections (CDI) Surveillance At A Long Term Acute Care Facility

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Citation

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Abstract

INTRODUCTION

Clostridium difficile is the most common cause of antibiotic associated colitis and is responsible for 15%–25% of cases of nosocomial antibiotic associated diarrhea. C. difficile is an anaerobic, gram positive bacillus and can be acquired from the environment due to its ability to produce spores. 1 Incidence rates range from 3.4 to 8.4 cases per 1,000 admissions in acute care hospitals. 2 LTAC fill the gap in health care services between short term acute care hospitals and skilled nursing homes or sub-acute facilities and are increasing in number across United States. There has been no surveillance data of C. difficile infection (CDI) in long term acute care facilities (LTAC) except one study that showed CDI rate of 3.21 per 1000 patient days. 3 Recently, discharge rates of CDI have increased most dramatically among persons aged 65 years or more and were more than 5 fold higher in this age group than among individuals aged 45–64 years. 4 Initial C. difficile episode is considered severe if patient has white blood cell count (WBC) of 15,000 or higher or a serum creatinine (Cr) level greater than or equal to 1.5 times the premorbid level. Treatment of choice for severe infection is oral vancomycin, 125 mg 4 times per day for 10 to 14 days. 5

A retrospective study was conducted from beginning of Jan 2012 to the end of Jan 2013 at a 53 bed LTAC located in Jackson, MS. There were total of 692 patients admitted during the 13 month time frame of the study. All patients were transferred from another acute care hospital and had positive exposure to antimicrobial agents. The facility only has single bed occupancy. An inclusion criterion was any patient with positive C diff stool test admitted during the study period. Infection Control nurse provided the identification of all patients with positive test. There were total of 26 patients that met the criteria, subsequently detailed chart review was performed.

The following data was collected: age, gender, co-morbidities (including coronary artery disease, diabetes, malignancy, chronic lung disease, renal failure, atrial fibrillation, peripheral vascular disease, hypertension and HIV), use of H2 blocker or proton pump inhibitor, ICU stay, current diarrhea, recent and current antibiotics, prior hospitalization or nursing home stay, recent surgery or gastro-intestinal tract manipulation, chemotherapy, presence of ileus, megacolon, pseudomembrances and previous history of CDI. Table 1 The following labs were recorded: WBC, Cr, glomerular filtration rate, ALT, ESR, CRP, albumin, pre-albumin, C. difficile toxin or PCR. The choice of antibiotic for management for CDI and clinical improvement were also recorded. All patients were placed on strict contact isolation and hand hygiene which were monitored by Infection control nurse. Strict room cleaning protocol was implemented.

FINDINGS

26 patients had a positive C. difficile stool test (either EIA or PCR). 9 (36%) patients had positive test at the time of admission to LTAC and 17 (65%) patients became positive at LTAC.

25 (96%) patients met the criteria for severe C. difficile (Two of the following: age>64 years, WBC>20 x 109 /L, ALT >40 U/L, Cr >2 mg/dl, Albumin <2.5 U/L).

All patients had received or were receiving broad spectrum antibiotics. 22 (84%) patients were receiving intravenous vancomycin or daptomycin plus piperacillin/tazobactam or meropenem or colistin or cefepime at the time of positive Clostridium difficile stool test. Antibiotics were de-escalated or discontinued based on susceptibility patterns of original

infections.

4 (15%) patients were nursing home residents. 4 (15%) patients had history of malignancy but no one had received recent chemotherapy.

In addition to recent transfer from an acute care hospital, 9 (35%) patients had prior hospitalization in an acute care facility in past 90 days as well. 12 (46%) patients had procedure or surgery done during recent hospitalization, 4 (33%) of which were PEG placements, 2 (16%) were incision and drainage of abscess, 2 (16%) had EGD and colonscopy, 1 (0.8%) nephrostomy, 1 (0.8%) small bowel resection and 1 (0.8%) had coiling for subarachnoid hemorrhage.

ESR was recorded in 12 (46%) patients and 3 (25%) of these patients had ESR >100.

CRP was recorded in 13 (50%) patients and 8 (62%) patients had value >3Only 1 patient had any previous history of C. difficile infection. All patients were HIV negative.

Diarrhea frequency ranged from three times a day to 10 times per day. 12 (46%) patients had diarrhea frequency 5 to 6 times per day. 5 (19%) patients had it more than 7 times of diarrhea per day. 9 (34%) patients had it 3 to 4 times per day. Diarrhea duration ranged from 1 to 6 days.

11 (42%) patients were managed with oral metronidazole and 10 (38%) patients were given oral vancomycin. 4 (15%) patients received intravenous metronidazole and only 1 (3.8%) patient received oral fidoxamicin. Only 1 (3.8%) patient was treated with empiric oral vancomycin.

Although SHEA guidelines do not recommend repeating C. difficile stool test for test of cure, it was done in 11 patients and was negative. 2 patients of the study group expired. Both patients were males and had sepsis and multi-organ failure on broad spectrum antibiotics. They were both getting treated with oral vancomycin. One of the deceased patients was able to clear stool C. difficile toxin and had no diarrhea prior to expiration.

3.75% LTAC patients had CDI in our study period. 1.3% of patients were diagnosed at outside hospital and 2.4% developed CDI at LTAC.

Generally all patients except one met the criteria for severe CDI. Based on SHEA guidelines, severe CDI should be treated with oral vancomycin but only 11 of our patients received oral vancomycin. Most patients improve clinically even if they were not treated with oral vancomycin but we are unaware of their long term clinical outcomes.

There is none to sparse data on on C. difficile patients in LTAC which calculated the severity of the disease. Our conclusion is that most LTAC patient when positive for C. difficile has severe disease so they should be treated with oral vancomycin as an initial therapy. There are limitations in size and duration of our study. More detailed and prospective studies are required in this LTAC population with long term follow up. Strict contact precautions and room cleaning protocols need to be implemented in these settings.

Table 1

Characteristics	Total
Age	73.85 (± 12.51)
WBC	18.6 (± 9.62)
Diarrhea	5.19 (± 2)
Glucose > 150	158.58 (± 73.62)
Albumin 2.5	2.23 (± .46)
ALT > 40	38.15 (± 34.9)
Creatinine > 2	1.75 (± 1.2)
GFR	42.69 (± 18.39)
Gender	
Female	14 (54%)
Male	12 (46%)
C-diff outside hospital	
No	15 (60%)
Yes	10 (40%)
C-diff LTAC	
No	4 (17%)
Yes	20 (83%)
DM2	
No	11 (42%)
Yes	15 (58%)
Ileus	
No	25 (96%)
Yes	1 (4%)
ICU stay	
No	10 (38%)
Yes	16 (62%)
Proton Pump Inhibitor Use	
No	14 (54%)
Yes	12 (46%)
H-2blocker Use	
No	16 (62%)
Yes	10 (38%)
Nursing home resident	
No	22 (85%)
Yes	4 (15%)
Cardiovascular disease	
No	1 (4%)
Yes	25 (96%)
Chronic lung disease	
No	12 (48%)
Yes	13 (52%)
Renal failure	
No	12 (46%)
Yes	14 (54%)
Malignancy	
No	22 (85%)
Yes	4 (15%)
Hypertension	
No	8 (31%)
Yes	18 (69%)
Atrial fibrillation	
No	21 (81%)
Yes	5 (19%)
Peripheral vascular disease	
No	22 (85%)
Yes	4 (15%)

Table 1 Cont'd

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ever. N Engl J Med. 2008;359:1932–1940.)
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