782. *Clostridioides difficile* environmental contamination in hospitalized patients with diarrhea: a pilot study

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Session: P-32. HAI: C. difficile

Background: The relative contribution of *Clostridioides difficile* colonization or infection in contamination of the hospital environment is poorly understood.

Methods: We performed a prospective cohort study of patients with diarrhea who were tested for *C. difficile* infection via PCR and enzyme immunoassay (EIA) to compare *C. difficile* environmental contamination by test result. Patients were stratified into one of three cohorts: PCR^-, PCR^+/EIA^+ or PCR^+/EIA^-. Environmental microbiological samples were taken within 24 hours of *C. difficile* cultures and again for two successive days for a total of three days. Patients were excluded if they had *C. difficile* infection in the past 6-weeks. Microbiological samples of surfaces were obtained with pre-moistened cellulose sponges from three locations (bathroom, adjacent to bed, and care areas) and processed using the stomacher technique. Ribotyping was completed on a subset of stool and environmental samples to measure concordance of isolates. CFU and recovery rates between arms were compared with a global ANOVA followed by pairwise comparisons using a Bonferroni adjustment.

Results: We enrolled 41 patients between November 2019 and March 2020. 7 patients were PCR^+/EIA^+, 8 were PCR^+/EIA^- and 26 were PCR^- (Table 1). A total of 347 individual and 116 room samples were obtained. PCR^+/EIA^+ patient rooms had a higher average room burden (435.6 CFU (95%CI: 178.0-694.0)) compared to PCR^+/EIA^- (83.5 (-9.1-175.0), p< 0.01) and PCR^- rooms (17.1 (1.2-33.0), p< 0.01); PCR^+/EIA^- and PCR^- rooms were similar (p=0.83). PCR^+/EIA^+ patient rooms had a higher recovery rate (61%) compared to PCR^+/EIA^- (36%, p=0.64), although not statistically significant, and PCR^- rooms (16%, p< 0.01); PCR^+/EIA^- had a similar recovery rate to PCR^- rooms (p=0.14) (Table 2). Of the rooms with both patient and environmental isolates, 79% of patient isolates had a concordant isolate recovered in the environment.

Table 1

	Total (%) N = 41	PCR^+/EIA^+ N = 7 n (%)	PCR^+/EIA^- N = 8 n (%)	PCR^- N = 26 n (%)	*p* EIA+ vs EIA-, EIA+ vs PCR-, EIA- vs PCR-
Median Age, years (IQR)	63 (56-70)	64 (54-70)	64 (55-70)	63 (55-70)	1.00, 0.21, 0.21
Female Sex	16 (39)	3 (29)	3 (38)	10 (38)	0.83, 0.83, 0.96
On Contact Precautions	23 (56)	7 (100)	7 (88)	9 (35)	0.33, <0.01, 0.01
Bedridden	13 (32)	1 (14)	4 (50)	8 (31)	0.14, 0.38, 0.32
Average Bowel Movements Within 24 hours of Enrollment (STDEV)	5 (5)	5 (4)	5 (5)	5 (5)	0.97, 0.97, 099
Prior Room Occupant *C. difficile* +	2 (5)	1 (14)	0 (0)	1 (4)	0.27, 0.30, 0.58
Hospitalized in Last 12 Months	25 (61)	4 (57)	2 (25)	19 (73)	0.20, 0.42, 0.14
Antibiotic Therapy in Prior 6 Months	17 (41)	5 (71)	1 (13)	18 (69)	0.02, 0.91, ,0.01
Antibiotic Therapy in Last 24 Hours	30 (73)	5 (71)	6 (75)	19 (73)	0.87, 0.93, 0.93
Average Hours From PCR Culture to Sampling (STDEV)	18 (3)	18 (4)	17 (3)	18 (4)	0.88, 0.67, 0.53
Average Number of Days Patient Was in the Room Before Sampling (STDEV)	8 (14)	5 (5)	6 (4)	10 (17)	0.70, 0.19, 0.25

Table 2

	Total N = 116	PCR^+/EIA^+ N = 18	PCR^+/EIA^- N = 22	PCR^- N = 76	EIA+ EIA+ EIA-
Room					
Average CFU	147.3	435.6	83.5	17.1	<0.01, <
Recovery Rate	27%	61%	36%	16%	0.64, <I
Patient Area					
Average CFU	8.6	48.4	1.1	1.3	0.27, C
Recovery Rate	7%	22%	5%	4%	0.09, <I
Bathroom Area					
Average CFU	139.4	385.6	82.4	15.7	0.04, C
Recovery Rate	23%	56%	32%	12%	0.13, <I
Care Area					
Average CFU	0.4	1.5	0	0.3	0.33, C
Recovery Rate	2%	6%	0%	1%	0.26, C

Conclusion: The amount of environmental contamination of PCR^+/EIA^+ patients was higher than both PCR^+/EIA^- and PCR^- patients, however, the recovery rate of PCR^+/EIA^+ patients was similar to PCR^+/EIA^- patients. Subsequent larger trials are needed to expand on this pilot data to determine the difference, if any, between environmental contamination levels of these patient populations.

Disclosures: David J. Weber, MD, MPH, PDI (Consultant)

783. *Clostridioides difficile* Infection among Maintenance Hemodialysis Patients

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Session: P-32. HAI: C. difficile

Background: Patients on maintenance hemodialysis (MHD) are 2-2.5 times more likely to develop *Clostridioides difficile* infection (CDI) with mortality rates 2-fold higher compared to the general population. The goal of this study was to determine factors and outcomes associated with severe/fulminant CDI among MHD patients.

Methods: A retrospective cohort study was performed among MHD patients admitted to 2 tertiary care hospitals, with first episodes of CDI between January 2015 and December 2018. MHD patients who had CDI at admission were identified through Theradoc® and confirmed by electronic medical records review. Using the Infectious Diseases Society of America criteria, non-severe CDI was defined as a white blood cell count ≤ 15000 cells/mL and severe/fulminant CDI was defined as a white blood cell count of ≥ 15000 cells/mL, hypotension, shock, megacolon and/or ileus. Creatinine values were not included. Patient demographics, comorbidities, antimicrobial exposure and 60-day mortality were collected on all patients.

Results: A total of 103 MHD patients with CDI were identified during the study period, of whom 68 (66%) had non-severe CDI and 35 (34%) had severe/fulminant CDI. The average age at admission was 65.3 years, 48.5% were female, and 59.2% were Caucasian. The average albumin level was 3.1 g/dL, and the average Charlson comorbidity index was 6.8. On univariate analyses, risk factors associated with severe/fulminant CDI as compared to non-severe CDI were older age at admission, elevated white blood cell count, exposure to extended-spectrum penicillins in the previous 90 days, and 60-day mortality after the first CDI (p-value ≤0.05). On multivariable logistic regression analysis, three factors remained significantly associated with severe/fulminant CDI (adjusted odds ratio [aOR], 95% confidence interval): 1] age ≥65 years (aOR=6.3 [2.25-17.45]), 2] extended-spectrum penicillins (aOR=2.7 [1.05-6.85], and 3] 60-day mortality after the first CDI (aOR=3.6 [1.11-11.74]).

Conclusion: A substantial proportion of patients requiring MHD with CDI present with severe/fulminant disease and are at increased risk of death. Reducing exposure to extended-spectrum penicillins may prevent severe/fulminant CDI in this patient population.

Disclosures: Joao Filipe G Monteiro, PhD, Brown Medicine (Consultant)

784. A Novel Method to Assess Virulence of *Clostridioides difficile*: Focus on *C. difficile* Ribotype 106

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Session: P-32. HAI: C. difficile

Background: *Clostridioides difficile* ribotype (RT) 106 has emerged as one of the most commonly isolated strains in the USA and worldwide. However, studies investigating clinical outcomes associated with this strain are lacking. The purpose of this study was to compare disease severity, clinical cure, and recurrence rates associated with CDI caused by RT106 vs two other comparator strains.

Methods: This multicenter study (20 hospitals) assessed hospitalized patients infected with *C. difficile* RT106 compared to patients infected with a known hypervirulent strain (RT027) and a strain associated with less virulence (RT014-020). Electronic medical records were reviewed by investigators blinded to RT. Disease severity was calculated using the 2017 IDSA/SHEA guidelines, initial clinical cure was defined as resolution of symptoms by day 6 of treatment, and recurrence assessed 90-days after the initial positive toxin test. All isolates were ribotyped using PCR fluorescent ribotyping.

Results: A total of 380 patients with CDI aged 66 ± 17 years (Female: 59.5%; White: 70.5%) infected with RT 106 (115/380; 30.3%), RT027 (116/380; 30.5%), and RT014-020 (149/380; 39.2%) were included. Approximately half of the patients had severe CDI (47.6%). Disease severity was highest for RT027 (59.3%) followed by RT014-020 (45%), and RT106 (41.2%). Clinical cure rates were lowest for RT027 (74.8%) followed by RT106 (77.8%), and RT014-020 (85.5%). 90-day recurrence rates were highest for RT027 (20.7%) followed by RT106 (13.3%), and RT014-020 (8.7%). Compared to RT014-020, virulence increased with RT106 (OR:1.10; 95% CI: 0.67-1.8) and RT027 (OR: 2.0: 95% CI: 1.2-3.5) was noted.

Conclusion: Our novel analysis method established RT106 as a moderately virulent *C. difficile* strain vs. comparator ribotypes. This study presents a novel method for comparing clinical outcomes for emerging ribotypes.

Disclosures: **Kevin W. Garey, PharmD, MS, FASHP**, **Merck & Co.** (Grant/Research Support, Scientific Research Study Investigator)