



Incidence and Outcomes of *C. difficile* Infection Following Colon Ischemia



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INTRODUCTION

Colon Ischemia (CI) is the most common ischemic injury to the gastrointestinal tract. *Clostridioides difficile* is the most commonly reported pathogen causing healthcare-associated infection. There is limited knowledge of the risk of *Clostridioides difficile* infection (CDI) after CI. Our hypothesis is that CI patients who develop CDI have worse outcomes compared with CI patients who don't develop CDI.

METHODS

We conducted a multicenter retrospective cohort study of patients admitted with biopsy-proven CI to Yale-New Haven Health Hospital, Montefiore Medical Center, Weiler Medical Center, and SUNY-Upstate Medical Center from 2005 to 2019. For each patient, we recorded numerous factors including the ACG severity scoring system. Patients who had CDI within the 3 months following CI (CI+CDI) were compared to patients who did not develop CDI (CI-CDI). Primary outcome was the frequency of CDI occurrence in the CI population, secondary outcomes included 30-day and 90-day colectomy, recurrent CI, readmission, mortality from the time of diagnosis of CI, and segmental involvement of CI+CDI and CI-CDI. Multivariate logistic regression was performed after adjusting for age, gender, race, Charlson Comorbidity Index (CCI) and the severity of CI.

RESULTS

Graph 1: Annual Incidence of CI + CDI

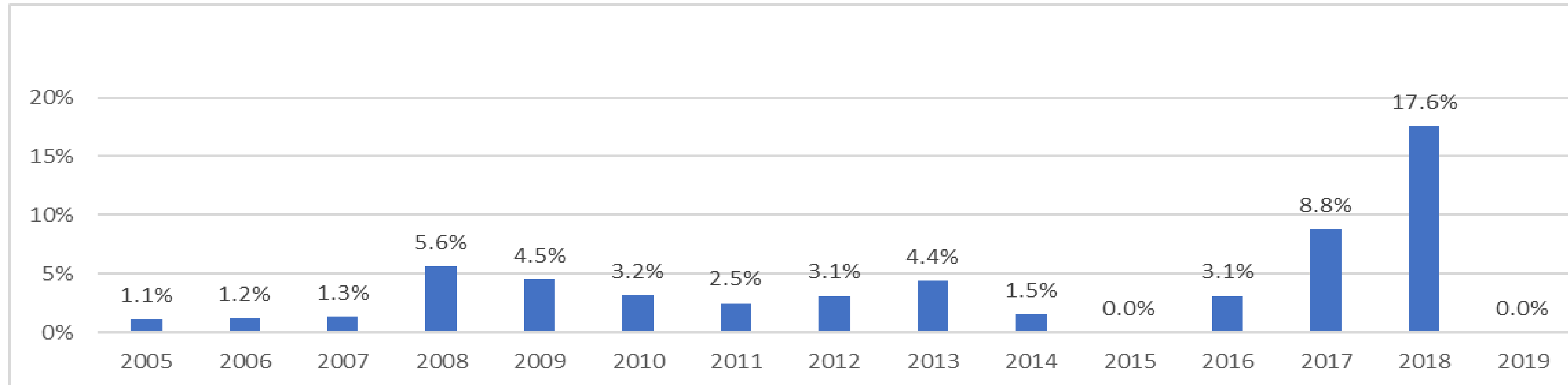


Table 1: Comparison of baseline features and outcomes of patients in CI+CDI and CI-CDI groups

Parameter	CI+CDI (n=29)	CI-CDI (n=877)	p value	Parameter	CI+CDI (n=29)	CI-CDI (n=877)	p value
Demographics				Bowel involvement CI			
Age (median, (IQR))	78 (71-83)	70 (61-79)	0.009	Small bowel involvement, n (%)	0 (0.0)	40 (7.6)	0.212
BMI (median, (IQR))	28.4 (22.3-31.1)	27.2 (23.5-31.5)	0.926	Pan colitis, n (%)	1 (4.0)	38 (5.1)	0.792
Females, n (%)	24 (82.7)	625 (71.2)	0.177	Any right colon involvement, n (%)	8 (44.4)	157 (25.4)	0.07
Medical Comorbidities				CI severity			
Diabetes Mellitus, n (%)	10 (34.4)	263 (29.9)	0.604	Right colon only, n (%)	7 (38.8)	103 (16.5)	0.013
Hypertension, n (%)	21 (72.4)	658 (75.0)	0.749	Mild/ Moderate CI, n (%)			0.086
Coronary Artery Disease, n (%)	8 (27.5)	261 (29.8)	0.792	Severe CI, n (%)			
Atrial Fibrillation, n (%)	8 (28.5)	129 (15.6)	0.066	Charlson co-morbidity Index, median (IQR)	5 (4-8)	5 (3-7)	0.057
Peripheral Vascular Disease, n (%)	4 (13.7)	73 (8.3)	0.304	ICU requirement, n (%)	6 (20.6)	213 (24.7)	0.6
Cerebral Vascular Disease, n (%)	5 (17.2)	92 (10.5)	0.248	Treatment			
Constipation, n (%)	8 (28.5)	224 (25.6)	0.729	Treatment with Antibiotics, n (%)	22 (75.8)	589 (68.7)	0.414

Outcomes

	CI+CDI (n=29)	CI-CDI (n=877)	p value
30-day readmission, n (%)	15 (51.7)	82 (9.3)	< 0.001
90-day readmission, n (%)	19 (65.5)	159 (18.1)	< 0.001
30-day recurrence CI, n (%)	5 (17.2)	14 (1.6)	< 0.001
90-day recurrence CI, n (%)	7 (24.1)	32 (3.6)	< 0.001
30-day colectomy, n (%)	4 (14.8)	108 (12.3)	0.703
90-day colectomy, n (%)	4 (14.8)	101 (11.5)	0.605
30-day mortality, n (%)	3 (10.7)	47 (5.3)	0.226
90-day mortality, n (%)	5 (17.6)	66 (7.5)	0.047

- 30-day readmission [OR 10.62 (95% CI:4.5-26.3), p<0.001]*
- 90-day readmission [OR 10.45 (95% CI:4.0-26.8), p<0.001]*
- 30-day recurrence CI [OR 7.3 (95% CI:1.9-27.3), p=0.003]*
- 90-day recurrence CI [OR 5.7 (95% CI:1.8-17.2), p=0.003]*

* Multivariate logistic regression for outcomes in CI+CDI vs CI-CDI (CI-CDI is the reference). Adjusted for age, gender, race, Charlson Comorbidity index & severity.

CONCLUSION

CI patients who developed CDI had higher rates of CI recurrence, more frequent readmission, and were more likely to have isolated right colon involvement than CI patients who did not develop CDI. When a patient with a recent history of CI is diagnosed with CDI, they might benefit from more aggressive therapy to try to improve these outcomes.