CLOSTRIDIUM DIFFICILE INFECTION IN INFLAMMATORY BOWEL DISEASE, RISK ANALYSIS AND DETERMINATION OF COMPLICATIONS BASED ON NATIONWIDE INPATIENT SAMPLE DATABASE

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Introduction

- Inflammatory bowel disease (IBD) mainly consists of Ulcerative colitis (UC) and Crohn's Disease (CD) affects over 3 million US adults.
- IBD patients tend to have a higher risk of infection due to inflammation, altered mucosal barrier, and immunosuppressive medications.
- Clostridium difficile infection (CDI) is one of the most common infections associated with IBD.
- Our aim was to assess the outcomes of inpatient admissions of IBD who have concurrent CDI.

Methods and materials

- We utilized the Nationwide Inpatient Sample (NIS) database from 2018 and 2019.
- Adult hospitalizations due to IBD with and without CDI were identified by previously validated ICD-10-CM codes.
- We used propensity score matching to balance the difference in baseline characteristics and comorbidities.
- Univariate and multivariate logistic regression for categorical variables and linear regression for continuous variables was carried out to identify independent associations at $p < 0.05$.
- Statistical Analysis was performed using R studio.

TABLE 1. Basic Demographics

Variable	IBD with No CDI, N = 77,190	IBD with CDI N = 25,730	p-value
Age in years at admission	56 (39, 71)	57 (37, 72)	>0.9
Gender			**0.006**
Male	34,010 (44%)	10,770 (42%)	
Female	43,175 (56%)	14,955 (58%)	
YEAR			>0.9
2018	40,230 (52%)	13,410 (52%)	
2019	36,960 (48%)	12,320 (48%)	
Immunosuppressive Medications	5,210 (6.7%)	2,150 (8.4%)	**< 0.001**
Sepsis	770 (1.0%)	315 (1.2%)	0.2
Shock	2,510 (3.3%)	2,140 (8.3%)	**< 0.001**
AKI	13,515 (18%)	6,115 (24%)	**< 0.001**
Mechanical_Ventilation	1,355 (1.8%)	635 (2.5%)	**0.001**
Vasopressor_Use	665 (0.9%)	390 (1.5%)	**< 0.001**
Toxic Megacolon	255 (0.3%)	90 (0.3%)	0.8
Total charge adjusted ($)	$32,224 (18,089-62,305)	$44,413 (24,539-88,884)	**< 0.001**
Inpatient Mortality	1,115 (1.4%)	845 (3.3%)	**< 0.001**
Length of Stay (median, IQR, days)	3.0 (2.0, 6.0)	5.0 (3.0, 9.0)	**< 0.001**

Table 2. Outcomes (Multivariate Analysis)

	Adjusted Odds Ratio	95% Confidence Interval	< 0.001
Inpatient Mortality	2.32	1.89 - 2.84	**< 0.001**
Shock	2.7	2.36 - 3.08	**< 0.001**
Mechanical_Ventilation	1.41	1.14 - 1.75	**< 0.001**
Vasopressor_Use	1.77	1.33 - 2.34	**< 0.001**
Length of Stay	1.05	1.04-1.06	**< 0.001**

Table 1: Basic demographics and complications in hospitalized IBD patients with and without CDI
Table 2: Mortality and outcome of hospitalized IBD patients with and without CDI.

Results

- A total of 102,920 patients were included in the study with IBD-related hospitalization. 25,730 patients with IBD had CDI of which 14,995 (58%) were females.
- IBD patients with CDI had an increased crude mortality rate of 3.3% vs 1.4% in IBD patients without CDI ($p < 0.001$) (Table 1).
- A higher proportion of IBD patients with CDI were on immunosuppressive medications 8.4% vs 6.7% ($p< 0.01$) in IBD patients without CDI.
- IBD patients with CDI have significantly higher rates of acute kidney injury, cardiovascular shock, and acute respiratory failure requiring mechanical ventilation.
- On multivariate analysis, IBD patients with CDI had "two fold" greater risk of death (OR 2.32, 95% CI: 1.89–2.84); more than 2 fold greater risk of a shock (OR 2.7, 95% CI: 2.36–3.08); higher risk of requiring ICU level of care (Table 2).
- Total adjusted charges are higher in IBD with CDI ($44,413) compared to without CDI ($32,224).
- The median length of stay is higher in IBD patients with CDI (5 days) compared to those without CDI (3 days) (Table-1).

Discussion

- IBD patients with CDI have a higher crude mortality rate, end-organ damage leading to severe CDI, and increased healthcare resource utilization.
- Early diagnosis of CDI, judicious use of antibiotics, and immunosuppressive medications should be recommended in IBD patients.
- IBD patients on immunosuppressive medications have a higher risk of CDI.
- Further research is needed for the reduction of morbidity and mortality in IBD patients with CDI.

References

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