Clostridium difficile Infection in Hematologic Malignancy Patients With and Without Bone Marrow Transplant: A National Comparative Study of Mortality, Length of Stay and Hospital Charges

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Introduction

Clostridium difficile infection (CDI) and Bone marrow transplant (BMT) can cause significant morbidity and mortality in patients with hematological malignancy(HM). However, data comparing the outcomes of CDI, BMT or both in HM patients is limited.

Objectives

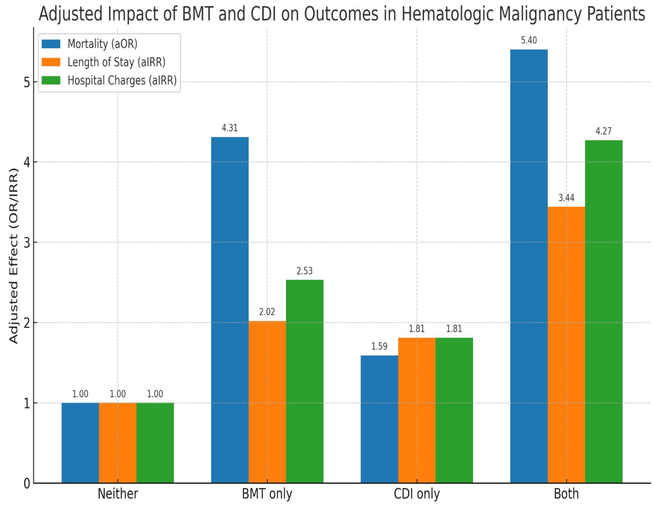
To assess the impact of CDI, BMT, and their co-occurrence on in-hospital mortality, length of stay (LOS), and hospital charges in adult patients hospitalized with hematologic malignancies in the United States.

Methods

We performed a retrospective cross-sectional analysis of the 2018–2022 National Inpatient Sample. Adult (≥18 y) hospitalizations with an ICD-10 diagnosis of hematologic malignancy (C81–C96, D46) were assigned to four exposure categories: no bone-marrow transplant (BMT) or C. difficile infection, BMT only, C. difficile only, and both exposures. National estimates were generated with discharge weights and survey design elements. Adjusted odds ratios (aOR) for in-hospital death were obtained with survey-weighted logistic regression. Survey-weighted Poisson models produced adjusted incidence-rate ratios (aIRR) for length of stay (LOS) and total charges. Covariates were age, sex, race/ethnicity, congestive heart failure, hypertension, diabetes, renal failure, chronic liver disease, and obesity. Statistical significance was set at $p < 0.05$, and all analyses were conducted in Stata SE 18.5 (StataCorp, College Station, TX)

Results

- The weighted cohort included 2.86 million discharges: neither (91.5%), BMT only (6.3%), CDI only (2.0%), both (0.3%). Compared with unexposed patients:
- BMT only: mortality aOR 4.31, LOS aIRR 2.02, charges aIRR 2.53
- CDI only: mortality aOR 1.59, LOS aIRR 1.81, charges aIRR 1.81
- BMT + CDI: mortality aOR 5.40, LOS aIRR 3.44, charges aIRR 4.27 (all $p < 0.001$)
- Median LOS was 5 days for neither vs 19 days for both exposures; median charges were $50,325 vs $231,439, respectively.



Conclusion

Both CDI and BMT significantly increase the clinical and financial burden in patients with HM. Their combination amplifies risk, underscoring the importance of CDI prevention and early intervention in this high-risk population—particularly in post-transplant settings.

Characteristic	Neither	BMT only	CDI only	Both
Age, yr - median [IQR]	70 [59-78]	67 [57-75]	68 [58-77]	65 [55-73]
Female, %	43.0	40.1	47.2	42.6
White, %	72.2	67.4	73.1	69.5
Black, %	12.1	14.7	11.8	13.0
Hispanic, %	9.5	10.5	9.3	10.1
Asian / Pacific Isl, %	2.9	3.4	2.8	3.2
Native / Other, %	0.4	0.5	0.4	0.7
Medicare, %	62.0	55.6	61.0	51.8
Private, %	24.4	29.4	26.0	32.2
Elective admission, %	19.0	22.8	14.7	27.8
Hypertension, %	62.8	61.5	62.0	57.0
Diabetes, %	27.0	26.8	25.8	21.9
CHF, %	22.7	28.3	23.3	27.6
Renal failure, %	24.6	30.1	28.2	29.9
Liver disease, %	6.1	11.4	8.0	13.3
Obesity, %	12.6	13.9	11.0	12.5
In-hospital death, %	4.9	18.5	7.6	21.9
LOS, days - median [IQR]	5 [3-8]	10 [5-20]	8 [4-16]	19 [10-31]
Total charges, USD - median [IQR]	50,325 [26,930-99,801]	143,062 [67,508-294,428]	72,554 [34,832-183,585]	231,439 [111,409-490,924]

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