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The economic burden of *Clostridioides difficile* infection in patients with haematological malignancies: a case-control study

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Background: The burden of *Clostridioides (Clostridium) difficile* infection (CDI) is profound and patients with hematological malignancies are at high risk for developing the infection. Very few studies have assessed the economic burden of CDI in this specific population, whereby primarily hospital costs were analyzed. This study aims at describing all direct healthcare costs attributable to CDI (in-hospital and out-of-hospital) in patients suffering from hematological malignancies.

Materials/methods: A retrospective analysis was conducted based on databases of Truven Health Analytics®, part of the IBM Watson HealthTM business. Comprehensive data of hospital stays and services, out-of-hospital services and drug prescriptions of patients newly diagnosed with hematological cancer (acute myeloid leukemia [AML], acute lymphoblastic leukemia, Hodgkin's lymphoma and non-Hodgkin lymphoma [NHL]) between 01/2014 – 12/2017 were analyzed. Patients with CDI after cancer diagnosis (CDI+ or cases) were matched to patients without CDI (CDI- or controls). Matched cases and controls were compared to identify the CDI-attributable costs and changes in care in the 90 days following the CDI onset (study period).

Results: 622 CDI+ patients were matched with 11,111 controls. NHL and AML were the predominant underlying diseases in the CDI+ group accounting for 41.7% and 30.9% of cases, respectively. Overall, CDI increased costs of care by an average of US$57,159 per patient, an increase of 41.9%, mainly driven by in-hospital costs. Costs data are presented in Table 1.

Conclusions: Findings confirm that CDI treatment results in substantial costs in patients with hematological malignancies, highlighting the need for better treatment and prevention options for this specific patient population.

Table 1: Healthcare costs per patient

Healthcare costs, (over study period, 2017 US$)		CDI+	CDI-	Difference	p-value
In-hospital	Mean (95% CI)	151,208 (136,679 - 165,738)	98,552 (95,896 - 101,207)	52,657 (37,887 - 67,427)	$p=6.10^{-12}$
Out-of-hospital services	Mean (95% CI)	37,612 (34,083 - 41,141)	34,850 (33,691 - 36,010)	2,762 (-952 - 6,476)	p=0.15
Out-of-hospital drugs	Mean (95% CI)	4,704 (4,003 – 5,404)	2,963 (2,802 - 3,125)	1,740 (1,021 - 2,460)	$p=3.10^{-6}$
TOTAL	Mean (95% CI)	193,524 (178,527 - 208,521)	136,365 (133,390 - 139,340)	57,159 (41,870 - 72,448)	$p=6.10^{-12}$
	Median	146,745	89,117		
	Min -Max	0 – 2,004,094	0 - 1,706,303		

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