

# CLOSTRIDIUM DIFFICILE INFECTION IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE: A CASE CONTROL STUDY \*



Author(s): Krista Vitikainen<sup>1</sup>, Johanna Haapamäki<sup>1</sup>, Martti Färkkilä<sup>1</sup>, Perttu Arkkila<sup>1</sup> and Veli-Jukka Anttila<sup>2</sup>

<sup>1</sup>Department of Gastroenterology, Helsinki University Central Hospital, Helsinki, Finland <sup>2</sup>Department of Infectious Diseases, Helsinki University Central Hospital, Helsinki, Finland

Inflammatory bowel disease (IBD) patients are at increased risk for developing symptomatic Clostridium difficile infection (CDI) (1). In previous studies IBD patients have been more susceptible to have recurrences of CDI (rCDI) (2). IBD patients with CDI have also higher inpatient mortality than IBD patients without CDI (3). In this study we compared CDI between IBD patients and age and gender matched patients without IBD.

## Materials and methods

In this retrospective cohort study, IBD patients with CDI were searched by ICD codes from 2008 to 2013 from medical and microbiological records at Helsinki University Hospital (HUU). All IBD patients with CDI were included.

### Control patients

Age- and gender-matched control group including non-IBD related CDI patients (CDI cohort) was collected from HUU infection control register.

### CDI routine diagnostics

Three step diagnostic methods for detection of CDI were used: C. difficile cytotoxin assay and stool culture to isolate C. difficile with subsequent cytotoxin assay, and in culture positive cases, O27 was tested by multiplex PCR method. Recurrence of CDI is defined as recurrent of diarrhea with a positive stool test at least 14 days after the initial episode of symptomatic CDI.

### Statistical methods

Patient characteristics between groups were analyzed using the chi-square test, the Fisher exact test and the Bonferroni multiple comparison test. One-way analysis of variance was used for continuous variables. A p value of <0.05 was considered statistically significant. All calculations were accomplished with NCSS-2000 software. For mortality analyzes, death for any cause within 2,7 and 30 days after established CDI diagnosis was recorded.

## Results

A total of 167 IBD patients with CDI and 164 age and gender matched CDI controls were included. Patient characteristics of both cohorts are represented in table 1.

•Table 1. Characteristics of the patients.

		IBD-CDI n=167	CDI without IBD n=164
Age	(Average±SD) yrs	46.1±21.0	42.9±20.2
Gender	Males n (%)	85 (50.9)	83 (50.6)
	Females n (%)	82 (49.1)	81 (49.4)
IBD subtypes	CD n (%)	48 (28.7)	NA
	UC n (%)	105 (62.9)	NA
	IBD-U n (%)	14 (8.4)	NA
CDI episodes	One (%)	116 (69.5)	120 (73.2)
	Two (%)	26 (15.6)	23 (14.0)
	Three or more (%)	25 (15.0)	21 (12.8)
Ribotype	O27 (%)	4 (2.4)	11 (6.7)
	Other (%)	160 (95.8)	149 (90.9)
	NA (%)	3 (1.8)	

The overall number of CDI episodes is shown in Table 1. The number of recurrences in rCDI was between two to five (mean+/-SD 1.54+/-0,97) and two to seven (mean+/-SD 1.52+/-1,08) episodes in the IBD-CDI and CDI cohort, respectively. No significant difference in recurrence rate was evident between IBD-CDI and CDI cohorts (p=0.551). O27 Ribotype was slightly less common in IBD patients (2.3% vs 6.9 %) than in controls.

In general, IBD-CDI patients also had lower mortality rates compared to controls. Two-day mortality rates were none vs. 1 (0 % vs 0.6%) in IBD-CDI and CDI patients, seven-day mortality rates 1 (0.6%) vs. 4 (2.5%) and 30-day mortality rates 3 (1.8%) vs. 8 (5.0%), respectively. Altogether, 30 days survival after CDI episode was 98.2% in IBD-related CDI and 95.0% in non-IBD related CDI (p=0.108).

When comparing the rates of 30-day mortality after CDI episode between genders in the IBD-CDI and CDI cohorts, we identified a difference in CDI-related mortality among men: 1.2% of IBD-CDI and 7.4% of CDI patients succumbed during 30 days after CDI diagnosis (p=0.046). Mortality rates did not differ among females (IBD-CDI vs. CDI patients, 2.4% vs. 2.5%, p=0.970).

In our study, none of the IBD patients underwent colectomy after CDI.

## Conclusions

There were no differences in the occurrence of recurrent CDIs between IBD and control patients.

In previous studies mortality rates were twice higher in IBD patients with CDI compared to IBD patients without CDI (3). In our study IBD-CDI patients seem to have even more favorable outcome than age and gender matched controls (without IBD). The lower mortality rate could be related to the fact that IBD patients with CDI had less often other unfavorable comorbidities than controls. There were no colectomies among our 167 IBD patients with CDI.

## References

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**In case of IBD exacerbation we recommend routine screening for Clostridium difficile.**