Evaluating the Independence of *Clostridioides difficile* Infections and Subsequent Irritable Bowel Disease Flares: A Retrospective Analysis

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Clostridioides difficile infection does not appear to influence irritable bowel disease course.

Introduction

It has been established that patients with Irritable Bowel Disease (IBD) are at higher risk of contracting a *Clostridioides difficile* (*C. diff*) infection compared to those without IBD [1, 2, 3]. However, the direct relationship between *C. diff* infections (CDI) and subsequent IBD flares remains relatively uncertain aside from one previous study [6]. Our study aims to evaluate the temporal association between IBD flares and CDI using a retrospective analysis of patient records.

Methods

This IRB-approved study utilized Bronson Methodist Hospital's electronic health records to identify all patients diagnosed with Crohn's disease or ulcerative colitis who also had a laboratory-confirmed CDI between June 2014 and June 2019. Manual chart reviews were conducted for a one-year period before and after the first positive *C. diff* test. This allowed patients to serve as their own control group in the year prior to their CDI.

- **Primary Outcome:** Evaluate the number of ED visits and hospital admissions prompted by an IBD flare in the year preceding vs. proceeding a CDI
- **Secondary Outcome:** Evaluate the number of outpatient visits where IBD was active in the year preceding versus proceeding a CDI

Timeline

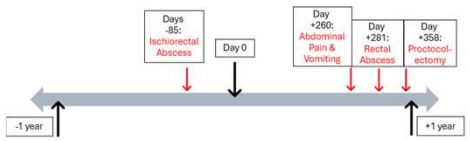

Figure 1: An example of a timeline generated for a patient within the study who had four hospital visits related to their underlying IBD. Day zero is the timepoint at which the patient was diagnosed with a CDI. Data points up to one year prior are termed pre-CDI and one year following CDI were termed post-CDI.

Results

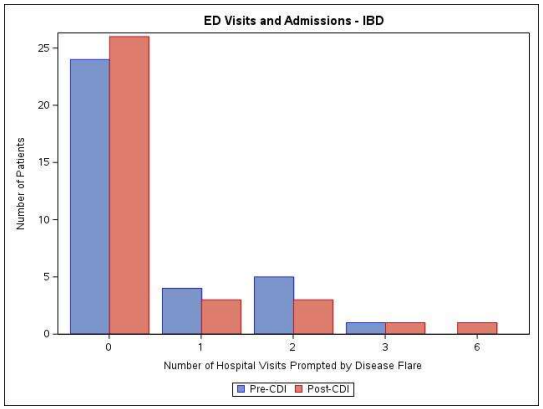

Figure 2: Histogram comparing the distribution in the number of ED visits and hospital admissions prompted by an IBD flare pre- vs. post-CDI

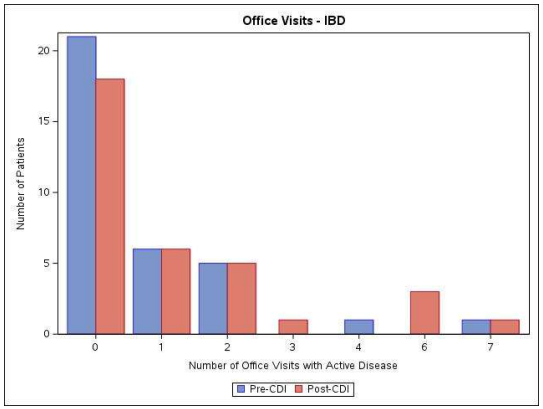

Figure 3: Histogram comparing the distribution in the number of office visits where patients had an active IBD flare pre- vs. post-CDI

Statistical Analysis

A Wilcoxon Signed-Rank test was used to determine if there is significant evidence of a difference in the number of ED visits and hospital admissions pre- and post-CDI. There is not statistically significant evidence of a difference in the number of ED visits and hospital visits one year prior and one year post CDI (p = .9316). A Wilcoxon Signed-Rank test was also used to determine if there is a significant difference in the number of outpatient visits related to IBD pre- vs. post-CDI. There is not statistically significant evidence of a difference (p =.1094) in the outpatient setting.

Conclusion

Our findings suggest that CDIs do not significantly increase IBD activity to the extent of requiring hospital-level care. These results support the hypothesis that CDIs and IBD flares are independent processes. **This is further confirmed by the outpatient data which shows no significant change in disease activity following a CDI.** Our study is limited in by a relatively small sample size of 34 total patients with CDI. However, the number of patients included in this study is not far below the number included in other similar retrospective chart reviews which included as few as 45 patients in the CDI study arm [4, 5, 6].

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