

RISK OF *CLOSTRIDIoidES DIFFICILE* INFECTION IN PATIENTS WITH CELIAC DISEASE: INSIGHT FROM A U.S.-BASED POPULATION STUDY

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Background

- Little is known about the association between *Clostridioides difficile* infection (CDI) and celiac disease.
- A prior study has shown that patients with celiac disease had a significantly higher incidence of CDI than controls.¹
- Aim:** The aim of the study is to describe the risk of CDI in patients with celiac disease and to describe the clinical outcomes in patients with celiac and CDI.

Methods

- Retrospective cohort study utilizing the commercial database (Explorys Inc™, Cleveland, OH). Diagnoses were organized into the Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT) hierarchy.
- Inclusion criteria**
Adults >18 years with a diagnosis of celiac disease were identified. Subsequently, individuals who developed a new diagnosis of CDI after at least 30 days of being diagnosed with celiac disease were identified.
- Outcomes**
Compared the incidence of new CDI among patients with celiac disease versus those without celiac disease (controls). Univariate and multivariate analyses were performed on the data, and associations were reported as odds ratios (OR) with 95% confidence intervals (CI).

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Table 1. Results: Demographics and Clinical Outcomes

| | Celiac patients | Control Patients |
|--|-----------------|---------------------|
| Number of patients | n=90,060 | n=25,807,720 |
| Age 18-65 years, n (%) | 65,220 (72.4%) | 18,331,970 (71%) |
| Age >65 years, n (%) | 24,840 (27.6%) | 7,475,750 (29%) |
| Female, n (%) | 66,800 (74.2%) | 13,219,060 (51.2%) |
| Race: Caucasian, n (%) | 73540 (81.7%) | 14,072,590 (54.5%) |
| Clostridioides difficile infection management and clinical outcomes | | |
| Developed Clostridioides difficile infection*, n (%) | 1,180 (1.31%) | 92,330 (0.35%) |
| Treated with metronidazole, n (%) | 820 (69%) | 56,490 (61.1%) |
| Treated with vancomycin, n (%) | 770 (65.2%) | 55,270 (59%) |
| Treated with fidaxomicin, n (%) | 70 (5.9%) | 4,370 (4.7%) |
| Colectomy**, n (%) | 10 (0.84%) | 970 (1.05%) |

Table 2. Multivariable model with CDI being the outcome

| Risk factors | Odds Ratio | 95% CI; p-value |
|-----------------------------|------------|-----------------------|
| Age ≥65 years vs < 65years | 2.98 | 2.962-3.014; < 0.0001 |
| Gender (female vs male) | 1.19 | 1.184-1.204; < 0.0001 |
| Race (Caucasian vs rest) | 1.48 | 1.467-1.498; < 0.0001 |
| Antibiotics | 3.66 | 3.6-3.7; < 0.0001 |
| Acid suppressive therapy*** | 4.27 | 4.224-4.313; < 0.0001 |
| Inflammatory bowel disease | 6.03 | 5.93-6.13; < 0.0001 |
| Celiac disease | 1.34 | 1.284-1.403; < 0.0001 |

*1st occurrence of CDI after celiac diagnosis

**Colectomy performed within 60 days of CDI diagnosis (excluded patients with a history of IBD, ischemic colitis, and neoplasia of the colon)

***Acid suppressive therapy includes prior use of proton pump inhibitors or H2 blockers

Results

- We identified 90,060 patients with celiac disease and 25,807,720 controls. **Table 1**
- The incidence of new CDI was 1.31% (1,180) in celiac disease patients, and 0.35% (92,330) in controls, OR 3.69 (95% CI 3.49-3.91; P< 0.0001). **Table 1**
- Treatment and clinical outcomes were not significantly different. **Table 1**
- After controlling for common CDI risk factors, the multivariate analysis model uncovered that celiac patients were more likely to develop CDI OR: 1.34 (95% CI: 1.2-1.4, P < 0.0001) compared to controls. **Table 2**

Conclusions

- In a large US population-based study, patients with celiac disease had a significantly higher incidence of CDI than controls.
- Clinical outcomes were similar between the groups.
- Clinicians should be vigilant and consider CDI in celiac patients with new or recurrent diarrhea.

References

- Lebwohl B, Nobel YR, Green PHR, Blaser MJ, Ludvigsson JF. Risk of Clostridium difficile Infection in Patients With Celiac Disease: A Population-Based Study. Am J Gastroenterol. 2017;112(12):1878-1884. doi:10.1038/ajg.2017.400