

## The Correlation between Clostridium Difficile Infection and Bronchial Lung Cancer Occurrence

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**Abstract :** Introduction: Clostridium difficile (C. diff) is a toxin-producing bacteria that can cause diarrhea and colitis. U.S. Center for Disease Control and Prevention revealed that C. difficile infection (CDI) has increased from 31 cases per 100,000 persons per year in 1996 to 61 per 100,000 in 2003. Approximately 500,000 cases per year occur in the United States. After exposure, the bacteria colonize the colon, where it adheres to the intestinal epithelium where it produces two toxins: TcdA and TcdB. TcdA affects the intestinal epithelium, causing fluid secretion, inflammation, and tissue necrosis, while TcdB acts as a cytotoxin. The purpose of this study was to evaluate the association between C diff infection and bronchial lung cancer development. Methods: Using ICD- 9 and ICD-10 codes, the data was provided by a Health Insurance Portability and Accountability Act (HIPAA) compliant national database to assess the patients infected with C diff as opposed to the non-infected patients. The Holy Cross Health, Fort Lauderdale, granted access to the database for the purpose of academic research. Patients were matched for age and Charlson Comorbidity Index (CCI). Standard statistical methods were used. Results: Bronchial lung cancer occurrence in the population not infected with C diff infection was 4741, as opposed to the population infected with C. diff, where 2039 cases of lung cancer were observed. The difference was statistically significant (p-value <  $2.2 \times 10^{-16}$ ), which reveals that C diff might be protective against bronchial lung cancer. The data was then matched by treatment to create to minimize the effect of treatment bias. Bronchial cancer incidence was 422 and 861 in infected vs. non-infected (p-value of <  $2.2 \times 10^{-16}$ ), which once more indicates that C diff infection could be beneficial in diminishing bronchial cancer development. Conclusion: This retrospective study conveys a statistical correlation between C diff infection and decreased incidence of lung bronchial cancer. Further studies are needed to comprehend the protective mechanisms of C. Diff infection on lung cancer.

**Keywords :** C. diff, lung cancer, protective, microbiology

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