

Lung Cancer Chemotherapy-associated Clostridium Difficile Infection among Elderly Patients in the United States

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Introduction

- ❑ Elderly lung cancer patients comprise a population that is vulnerable for Clostridium difficile infection (CDI).¹
- ❑ Non-Small Cell Lung Cancer (NSCLC) is the most common type of lung cancer, and ~40% of patients with newly diagnosed NSCLC have advanced stage (Stage III-IV) disease.
- ❑ Advanced NSCLC is a treatable, but not curable, clinical entity in patients. However, advanced NSCLC patients can still benefit from active cancer treatment.²⁻⁴
- ❑ In addition to the hospitalizations, the administration of chemotherapeutic agents has been associated with the development of CDI.¹
- ❑ The objective of this study was to identify the patterns of chemotherapy-associated CDI, in a nationwide sample of elderly lung cancer patients.

Methods

- ❑ We used NCI's Surveillance, Epidemiology, and End Results (SEER) cancer registry linked Medicare (SEER-Medicare) claims data files from years 2007-2012.

Study cohort: Patients diagnosed with incident lung cancer in the years 2008 to 2011, at age ≥65 years and surviving at least 9 months post-diagnosis.

Inclusion / Exclusion Criteria

- ❑ We excluded patients who did not receive chemotherapy, were enrolled in a health maintenance organization, and/or were not covered by Medicare Parts A and B at any point during that time period.

Study Measures

- ❑ Using the Healthcare Common Procedure Coding System (HCPSC) and Current Procedural Terminology (CPT) codes, we identified patients who had received first-line chemotherapy either in a physician's office or at an outpatient department within a hospital.
- ❑ Incidence of CDI was determined by identifying any claim with primary/secondary diagnosis of CDI during the two-month year follow-up period.

Statistical Analysis

- ❑ Pearson chi-square tests were used to determine unadjusted associations between categorical variables of interest.
- ❑ All analysis was performed using Statistical Analysis System (SAS) software Version 9.4.

Results

- ❑ We identified 168,212 elderly patients with lung cancer diagnosis during the study years.
- ❑ Of those, 5,770 patients were included in the study based on the inclusion criteria.
- ❑ Thirty eight patients developed chemotherapy-associated CDI within two months of chemotherapy.
- ❑ Almost 50% of patients with chemotherapy-associated CDI developed recurrent chemotherapy-associated CDI.
- ❑ Patient characteristics were not associated with risk of developing chemotherapy-associated CDI, however, significant differences were observed in antibiotics exposure ($p < 0.001$).

Table 1. Descriptive characteristics of continuously enrolled Medicare Fee-for-service beneficiaries with incident lung cancer diagnosis in the United States, 2007-2012.

Characteristic	%	P-Value
Total	100	
Age at diagnosis, years		< 0.01
65-69	18.10	
70-74	22.90	
75-79	23.84	
80-84	20.86	
85+	14.30	
Sex		< 0.1
Male	41.23	
Female	58.77	
Klabunde-Charlson comorbidity score		< 0.06
0	33.20	
1	31.90	
> 1	34.90	
Residence		< 0.01
Big Metro	46.30	
Metro	28.32	
Urban/Rural recode	5.30	
Less Urban	12.40	
Rural	7.68	

Table 2. Chemotherapy-Associated Clostridium difficile infection among elderly Lung Cancer Patients in the US, 2007-2012

Year	Number of Cancer Patients with Lung Cancer Diagnosis	Number of Lung Cancer Patients receiving chemotherapy and meeting study inclusion criteria	Number of Lung Cancer Patients Developing CDI within 2 months of Chemotherapy
2007	35,771		
2008	35,073	1,424	5
2009	34,336	1,436	9
2010	32,521	1,424	14
2011	30,511	1,486	10
2007-2011	168,212	5,770	38

Limitations

- ❑ An inherent limitation of using administrative claims data for epidemiologic studies is the possibility of misclassification as a result of coding errors. However, claims data have been evaluated for their utility as a source of epidemiologic and health services information in cancer patients.
- ❑ The results of this study are generalizable to the Medicare Fee-for-service (FFS) population aged 65 years and older, as data for Medicare beneficiaries enrolled in the managed care plan were not available for this study.
- ❑ Information on care received by beneficiaries outside of the Medicare system, or through non-Medicare providers, was not captured in this study.

Conclusions

- ❑ While the incidence of chemotherapy-associated CDI infection is lower among lung cancer patients, the rate of recurrent chemotherapy-associated CDI infection was significantly higher.
- ❑ Strategies to prevent Clostridium difficile infection recurrence in this population are therefore warranted

References

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