CHEST Online Supplement

Trends in Bronchiectasis Among Medicare Beneficiaries in the United States, 2000 to 2007

Amy E. Seitz, MPH; Kenneth N. Olivier, MD, MPH; Jennifer Adjemian, PhD; Steven M. Holland, MD; and D. Rebecca Prevots, PhD, MPH

e-Appendix 1.

Methods

Database and populations

The Carrier claims SAF contains information on the claims level from non-institutional outpatient healthcare providers. Examples of non-institutional providers include private practice physicians or physician's assistants, free standing ambulatory surgical centers, or clinical laboratories. Information includes claims level data for diagnoses and procedures, using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes or CMS Healthcare Common Procedure Coding System (HCPCS) codes, date of service, and payment information.

The denominator file includes annual demographic and enrollment information for each Medicare beneficiary. Enrollment information consists of variables containing the number of months of enrollment in Medicare Part B and monthly coverage through a managed care organization.

Period Prevalence

We calculated eight year period prevalence estimates from 2000-2007. The denominator population comprised the total number of individuals who had at least one month of enrollment in Medicare Part B from 2000-2007. To identify the independent effects of sex and race\ethnicity while controlling for CT use, we constructed a

 DOI: 10.1378/chest.11-2209

multivariate logistic regression model using backward selection with a significance level of 0.05. This model included sex, race, and CT use; interaction terms for CT use with sex and race\ethnicity by CT use were evaluated for this model.

Annual Prevalence

The annual prevalence of bronchiectasis was calculated by counting each individual only once for the year. To reduce possible bias that could result from excluding individuals with less than a specified number of months of contribution in a given year, we used person-years as the denominator when calculating average annual prevalence estimates. Age and sex specific annual prevalence rates were assessed. Additionally, we used univariate Poisson regression models with year as the predictor variable to separately model the annual percentage change (APC) in the prevalence of bronchiectasis and the rate of thoracic CT scans from 2000-2007.

Co-morbidities

To describe the most common conditions associated with bronchiectasis in this population, we identified ICD-9-CM codes representing >1% of the total primary diagnosis claims among people with bronchiectasis. We then compared this figure to the proportion of claims with this ICD-9-CM code as the primary diagnosis among the entire population to identify ICD-9-CM codes uniquely high among persons with bronchiectasis. In addition, we described the frequency of conditions with known or suspected associations with bronchiectasis, such as rheumatoid arthritis and nontuberculous mycobacterial infection, even if they were not identified in the initial screen. We calculated the prevalence ratio for these conditions as the percentage with both bronchiectasis and the condition of interest divided by the percentage with the condition of interest among the general population. COPD was found to have a high occurrence (>80%) among persons with bronchiectasis, possibly because bronchiectasis was considered as a chronic obstructive pulmonary disease for coding purposes. Therefore we did not include COPD in our co-morbidity analysis.

Bronchiectasis Case Definition

To identify the degree of potential bias from 'rule-out' diagnoses of bronchiectasis, we compared demographic variables between individuals with at least one bronchiectasis claim to those with two or more bronchiectasis claims. We also calculated the period prevalence and APC by sex among persons with at least two claims of bronchiectasis then compared this to the result for individuals with at least one claim of bronchiectasis.

Results

Bronchiectasis Case Definition

Overall, 53% (11,759) of cases in our study had at least two claims of bronchiectasis from 2000-2007. Women were significantly more likely to have two or more claims of bronchiectasis (% with two or more claims: men: 48%; women: 56%; p-value <.0001). Whites and Asians were both significantly more likely to have two or more claims of bronchiectasis than blacks (% with two or more claims: whites: 54%; blacks: 41%; Asians: 51%; p-values both <.0001).

Among individuals with at least two bronchiectasis claims, women had an overall higher period prevalence as compared to men (men: 245.7 [95% CI: 235.2, 256.2], women: 414.8 [95% CI: 403.2, 426.5]). However, the absolute estimates were lower when using the case definition of at least two claims of bronchiectasis. The APC for all persons with at least two claims of bronchiectasis was 7.47 (95% CI: 6.32, 8.63) which was similar to the overall APC for all individuals with at least one claim of bronchiectasis. As was seen among individuals with at least one bronchiectasis claims, the APC among persons with at least two thoracic CT scans was not significantly different between men and women (men: 7.60 [95% CI: 5.85, 9.37]; women: 7.60 [95% CI: 6.63, 8.57]).