INTRODUCTION

- The incidence and prevalence of nontuberculous mycobacterial lung disease (NTMLD) is increasing in the United States (US).
- In 2015, the incidence and prevalence of NTMLD per 100,000 people were 4.7 and 9.9, respectively.
- Between 2008 and 2015, the average annual increases in overall incidence and prevalence of NTMLD in the US were 6.6% and 8.3%, respectively.
- NTMLD is associated with declines in lung function and increased mortality and often occurs in the setting of structural lung diseases such as chronic obstructive pulmonary disease (COPD) and bronchiectasis (BE).
- Chronic pulmonary diseases, including COPD and BE, have been identified among prevalent comorbidities in patients with NTMLD.
- However, the risk of NTMLD in patients with incident BE or COPD is not well understood, and the reporting on NTMLD incidence and prevalence in BE and COPD patient cohorts has been limited.

OBJECTIVE

- The objective of this study was to estimate incidence and prevalence of NTMLD in patients diagnosed with BE or COPD between 2013 and 2015.

METHODS

- Individuals with ≥2 medical claims for BE or COPD between 2012 and 2015 were identified from a large national US managed care claims database (2007-2016; Figure 1).
- All patients included in the incident BE or COPD cohort had at least 12 months (baseline) continuous healthcare insurance coverage prior to the first available physician claim for BE or COPD.
- Patients who had no previous claim for NTMLD at baseline were excluded from the incident BE cohort. Likewise, patients who had a physician claim for BE or NTMLD were excluded from the incident COPD cohort.
- Yearly NTMLD incidence and prevalence were estimated by identifying patients with ≥2 medical claims ≥30 days apart in the BE and COPD cohorts.
- When calculating incidence, 12 months of prior medical insurance coverage was required for each yearly estimate (for example, to estimate the incidence in 2013, patients who did not have 12 months of insurance coverage in 2012 were excluded).
- The overall rate of NTMLD per 1,000 person-years was estimated from the BE and COPD cohorts using a Poisson regression.

RESULTS

- Incident BE and COPD Cohorts

- The incident BE and COPD cohorts consisted of 15,410 and 687,993 individuals, respectively (Table 1).
- The majority of patients in the BE (64%) and COPD (55%) cohorts were aged ≥65 years of age compared with men <65 years (0.17 vs 0.10) (Table 1).
- When calculating incidence, 12 months of prior medical insurance coverage was required for each yearly estimate (for example, to estimate the incidence in 2013, patients who did not have 12 months of insurance coverage in 2012 were excluded).
- The overall rate of NTMLD per 1,000 person-years was estimated from the BE and COPD cohorts using a Poisson regression.

Incidence and Prevalence of NTMLD

- Patients with BE had a significantly higher risk of NTMLD than patients with COPD (observed rate ratio: 37.8, 95% CI, 32.7-43.7; P<0.001).
- In the BE cohort, age-gender standardized incidence per 1,000 patients in 2013-2015, NTMLD increased from 7.1 to 10.0 per 1,000 BE patients and prevalence increased from 23.3 to 28.1 (Figure 2).
- In the COPD cohort, age-gender standardized incidence per 1,000 patients, age and <65 years, respectively (Table 2).
- In the BE cohort, age-standardized incidence per 1,000 patients in 2013 was higher in women <65 years of age compared with <65 years of age (211.8 and 61.6), a pattern which was also observed in the COPD cohort.
- Between 2013 and 2015, the overall rate of NTMLD in the BE cohort was 11.2 per 1,000 person-years and 0.3 per 1,000 person-years in the COPD cohort.

DISCUSSION

- This national US population-based study provides needed data on NTMLD incidence and prevalence in BE and COPD cohorts.
- In 2015, the prevalence of NTMLD was 2.5% in the BE cohort and 0.05% in the COPD cohort.
- Over the 3-year period from 2013-2015, NTMLD risk in patients with preexisting BE was 38 times higher than in patients with preexisting COPD.
- The wide range of estimates in the literature of rates of NTMLD among patients with preexisting BE; however, most of the studies were based on clinical centers and were not population-based.
- For example, in a US population-based study, NTMLD patients/1,000 persons was reported to range from 3% of patients meeting American Thoracic Society criteria for inhaled nontuberculous mycobacteria (single-center UK) to 30% of patients meeting criteria for NTMLD in a retrospective single-center US study.
- Also of interest, a meta-analysis of 8 studies of patients with BE (number of patients ranged from 50 to 866) in various countries (Australia, China, Iran, South Korea, Thailand, and the United Kingdom) reported a combined prevalence of NTM infection of 9.3% (95% CI 5.0%-13.6%); the rate of NTMLD was not reported.
- The incidence and prevalence of NTMLD among patients with preexisting BE and COPD were notably higher than that in the general population.
- The ratios of NTMLD incidence and prevalence in patients with preexisting COPD compared with the general population were 4.5 and 4.6, respectively.
- Given the high prevalence of NTMLD in the general population and the elevated risk of NTMLD among patients with COPD, it is anticipated that the number of patients with NTMLD is large and has been underestimated in the past.
- The high prevalence and incidence in patients with preexisting BE compared with the general population were 211.8 and 214.5, respectively, reflecting an exceptionally pronounced risk of NTMLD in this patient group.

CONCLUSIONS

- NTMLD incidence and prevalence were substantially higher in patients with preexisting BE compared to those with preexisting COPD.
- Following diagnosis of BE, we anticipate that 2% of patients are likely to have NTMLD per year.
- Due to the large number of people with COPD in the general population, the absolute number of patients at risk of NTMLD is also anticipated to be high, representing an important clinical burden in this population.
- Improved awareness of NTMLD risk in patients with BE and COPD can help improve timely diagnosis and appropriate clinical intervention.

REFERENCES

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