Risk Factors and Diagnosis of Nontuberculous Mycobacterial Lung Disease in Incident Cohorts of Bronchiectasis and Chronic Obstructive Pulmonary Disease in a National US Managed Care Insurance Plan

Kenneth Olivier, Jennifer Adjemian, Engels Chou, Gina Eagle, Raymond Zhang, Quanwu Zhang

INTRODUCTION

- Nontuberculous mycobacterial lung disease (NTMLD) is often associated with a subset of clinical features, including structural lung damage, decreased lung function, increased risk of respiratory failure, and increased mortality.
- Structural lung damage caused by bronchiectasis (BE) may render patients more susceptible to NTMLD. Similarly, NTMLD may be associated with chronic obstructive pulmonary disease (COPD).

OBJECTIVE

- To evaluate the risk of NTMLD in patients following diagnosis with BE or COPD, and to identify factors that may affect the occurrence of NTMLD in these populations.

METHODS

Study Design
- Individuals with ≥2 medical claims for BE or COPD between 2008 and 2015 were identified from a large, national US managed care claims database (2007-2016; Figure 1).
- Of the initial cohort consisting of 562,136 COPD patients, 92,209 individuals newly diagnosed with BE were included in the study.
- The same study population was used during the prior 12 months to estimate the incidence of BE or COPD.

RESULTS

- Incidence of NTMLD
  - Of special interest, a lower risk of NTMLD was observed among individuals with BE vs COPD (28.04, 24.07-32.67; P < 0.0001).
  - The incidence of NTMLD was 0.08% in COPD patients vs 0.02% in BE patients.
  - This is the first reported nationwide (US) population-based study of NTMLD in incident BE and COPD cohorts, and the results add to the limited knowledge about NTMLD prevalence in both cohorts.

Impact of Demographic Factors on NTMLD Risk
- Older age and female gender were associated with increased risk of NTMLD in patients with incident BE and COPD.
- Ten characteristics were associated with NTMLD.

Impact of Comorbidities on NTMLD Risk
- Comorbidities significantly associated with an increased risk of NTMLD in BE or COPD cohorts were aspergillosis, CF, immunosuppressant use, immune system disorders, CHF, or liver disease.
- Factors associated with a decreased risk of NTMLD in patients with newly diagnosed BE or COPD were concomitant heart failure, diabetes, hypertension, and obesity.

DISCUSSION

- This is the first reported nationwide (US) population-based study of NTMLD in incident BE and COPD cohorts, and the results add to the limited knowledge about NTMLD prevalence in both cohorts.
- Additional factors associated with increased NTMLD prevalence in both cohorts include older age, female gender, long-term use of immunosuppressant drugs, and immunosuppressant drugs, heart valve disease, and moderate to severe liver disease.
- Obesity was associated with a lower risk of NTMLD, consistent with findings in patients with tuberculosis, possibly due to immune-modulating effects of leptin.
- The findings that patients with diabetes or hypertension had a lower risk of NTMLD may be due to higher rates of obesity in these patients, which may not have been linked in the claims data.
- Reasons for lower risk of NTMLD associated with factors such as diabetes were not clear.
- In addition, the subgroup analysis finding that comorbidities such as CHF, GERD, and heart valve disease were associated with a lower risk of NTMLD in patients with BE was unexpected.

CONCLUSIONS

- The risk of NTMLD is substantially higher in the incident BE cohort compared with the COPD cohort.
- Factors that may contribute to a further increased risk of NTMLD in patients newly diagnosed with BE or COPD include older age, female gender, long-term use of immunosuppressant drugs, concomitant heart failure, diabetes, hypertension, and obesity.

ACKNOWLEDGMENTS

The authors acknowledge the Orbis Data Solutions, Inc for providing consulting services to Insmed Incorporated.

REFERENCES


DISCLOSURES

The authors have no financial disclosures. This study was supported by Grant HD085967 from the National Institutes of Health, the Department of Veterans Affairs, and the National Heart, Lung, and Blood Institute.