Impact of Omalizumab Treatment on Asthma-Related Health Care Resource Utilization in a Real-world Data Set From a Managed Care Plan

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Background

- Asthma accounted for ~189,00 hospital inpatient stays, 1.8 million emergency department (ED) visits, and 9.8 million physician office visits in 2016.[1]
- An important goal of asthma management is to reduce asthma exacerbations.[2,3]
- In clinical studies, treatment with asthma biologics has been associated with reductions in asthma exacerbations; however, further understanding of the impact of biologic treatment on asthma-related hospitalizations and other health care resource utilization (HCRU) in a real-world setting is required.[4,5]
- Omalizumab is an anti–immunoglobulin E monoclonal antibody that is effective at reducing asthma exacerbations and improving asthma control in patients with moderate-to-severe persistent allergic asthma that is inadequately controlled with inhaled corticosteroids.[5]

Objective

- To examine the asthma-related HCRU among patients treated with omalizumab for asthma in an integrated regional managed care plan.

Methods

Patients

- A retrospective cohort study using medical and prescription claims data from the SelectHealth insurance plan from January 2012 to December 2016 was conducted.
- Eligible patients were identified in January 2013 to December 2015.
- Inclusion criteria:
  – Aged ≥6 years *and*
  – Had ≥2 medical claims occurring on different dates with a primary diagnosis of asthma *and*
  – Had appropriate enrollment records *and*
  – Treated with omalizumab for ≥16 weeks (without a gap of >4 weeks) *and*
  – Had ≥90 days of follow-up after the index date (post-index period), defined as the date that the minimum exposure to omalizumab had been met (index date).

Assessments

- Annualized asthma-related HCRU, defined as medical claims with a primary diagnosis of asthma, was assessed during the pre- and post-index periods. Asthma-related HCRU included:
  – Number of hospitalizations
  – Total days of inpatient hospital stays
  – Number of ED visits.
- Annualized asthma-related HCRU was calculated as the proportion of hospitalizations or visits over the entire follow-up, divided by years of follow-up.

Statistical Analysis

- Descriptive statistics were used for baseline demographic and clinical characteristics.
- Means and SDs for annualized asthma-related HCRU were summarized in the pre- and post-index periods.

Results

Patient Disposition and Baseline Characteristics

- Of the 194 patients treated with omalizumab between 2013 and 2015, 102 patients met the study criteria (**Figure 1**).
- The mean (SD) patient age was 45.2 (17.0) years, and the majority of patients were female (64.7%; **Table 1**).
- The most common comorbidities were rhinitis (91.2%), sinusitis (61.8%), and cough (49.0%; **Table 2**).

Figure 1. Study Cohort Selection
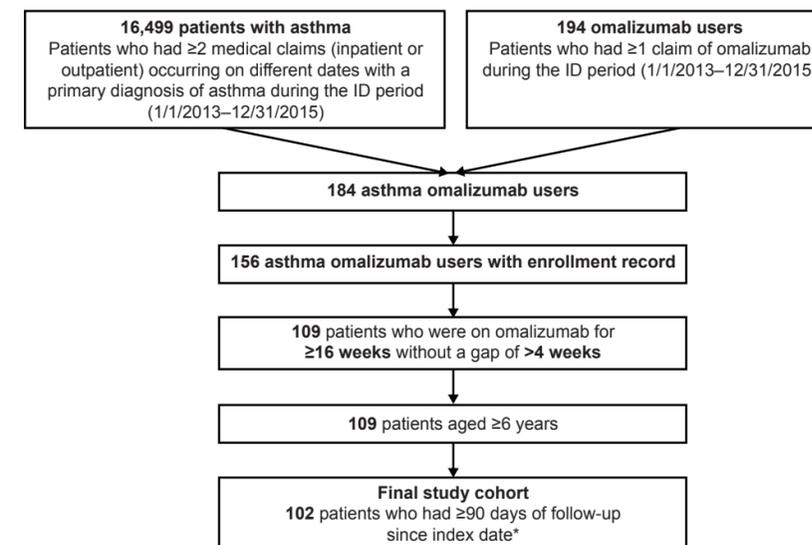
ID, identification period. *The index date is the date that the minimum exposure of omalizumab (16 weeks or 90 days of use) was met.

Table 1. Baseline Demographic and Clinical Characteristics

Characteristic	Omalizumab N=102
Mean (SD) age, y	45.2 (17.0)
Female, n (%)	66 (64.7)
Mean (SD) Charlson Comorbidity Index score	1.5 (1.0)
State, n (%)	
Idaho	8 (7.8)
Utah	94 (92.2)

Table 2. Patient Baseline Comorbidities Among Omalizumab Users (≤1 Year Before Index Date)

Comorbidity, n (%)	Omalizumab N=102
Rhinitis	93 (91.2)
Sinusitis	63 (61.8)
Cough	50 (49.0)
Gastroesophageal reflux disease	31 (30.4)
Acute upper respiratory infection	31 (30.4)
Conjunctivitis	31 (30.4)
Eczema/dermatitis	25 (24.5)
Urticaria/angioedema	21 (20.6)
Food allergy	16 (15.7)
Atopic dermatitis and related conditions	12 (11.8)
Nasal polyposis	12 (11.8)
Anaphylaxis	9 (8.8)
Chronic obstructive pulmonary disease	9 (8.8)
Tonsillitis	1 (1.0)
Chronic otitis media	1 (1.0)

Pre- and Post-index Period Asthma-Related HCRU

- Asthma-related HCRU decreased from the pre- to post-index periods.
- The mean (SD) number of annual asthma-related hospitalizations decreased from 0.08 (0.52) to 0.01 (0.07; **Figure 2**), while the mean total days of inpatient hospital stays annually decreased from 0.26 (1.95) to 0.03 (0.22; **Figure 3**). The mean (SD) number of annual asthma-related ED visits decreased from 0.20 (0.86) to 0.09 (0.35; **Figure 4**).
- To place these results in context, in a health plan enrolling 100 patients diagnosed with asthma, the total number of asthma-related hospitalizations would decrease from ~8 admissions to 1 admission per year following omalizumab use.

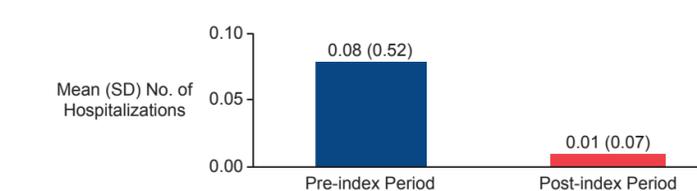### Figure 2. Annualized No. of Hospitalizations

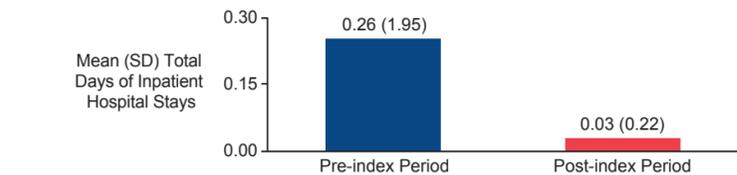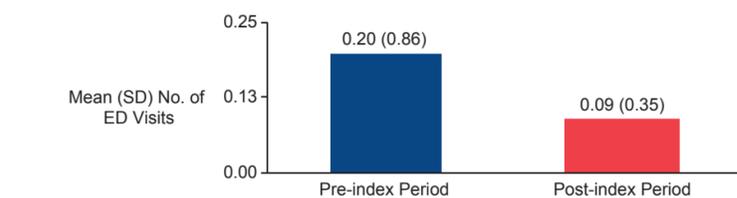### Figure 3. Annualized Mean Duration of Inpatient Hospital Stays

Figure 4. Annualized Number of ED Visits

ED, emergency department.

- Safety was not evaluated in this analysis.

Conclusions

- In this real-world analysis of patients enrolled in an integrated regional managed care plan, asthma-related HCRU (hospitalizations, days of inpatient hospital stays, and ED visits) was lower during the post-index period for patients with asthma treated with omalizumab.
- To place the reductions in HCRU observed in context, in a health plan enrolling 100 patients diagnosed with asthma, the total number of asthma-related hospitalizations would decrease from ~8 admissions to 1 admission per year following omalizumab use.
- Limitations of the study comprised of missing or incomplete enrollment records, which limited the number of patients included in the study.
- Nonetheless, these observations are consistent with prior real-world studies assessing the impact of omalizumab on HCRU.[6,7]

References **1.** Centers for Disease Control and Prevention. Most recent national asthma data. https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm. Accessed August 20, 2019. **2.** National Asthma Education and Prevention Program. *J Allergy Clin Immunol.* 2007;120(5)(suppl):S94–138. **3.** Global Initiative for Asthma. Global strategy for asthma management and prevention. https://ginasthma.org/gina-reports/. Accessed August 20, 2019. **4.** Farne HA, et al. *Cochrane Database Syst Rev.* 2017;9:CD010834. **5.** Normansell R, et al. *Cochrane Database Syst Rev.* 2014;(1):CD003559. **6.** Casale TB, et al. *J Allergy Clin Immunol Pract.* 2019;7:156–64.e1. **7.** Ke X, et al. *Clin Ther.* 2018;40:1140–58.e4.

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