Cost and Healthcare Utilization in Asthma Patients with High Oral Corticosteroid-Use

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RATIONALE

- Treating asthma with oral corticosteroids (OCS) is effective, but comes with significant side effects.
- Despite these risks, a sub-population of severe persistent asthma patients whose disease cannot be controlled with both inhaled steroids (ICS) and a second controller requires long-term OCS treatment.[4]
- The threshold of ≥30 days of OCS filled in a year identifies a subset of moderate-to-severe asthma patients who are persistently high OCS users.[2]
- Little is known about how the cost and healthcare utilization of these "high OCS" using patients compares to their low-OCS using counterparts.
- Our objective was to compare healthcare resource use and economic outcomes between high- and low-OCS users.

METHODS

- We identified moderate-to-severe persistent asthma patients with ≥2 asthma claims, ≥2 asthma medications, EPR3 Step 4-6 (using a validated algorithm[5]), ≥ 18 years of age, who were enrolled during calendar year 2013 from a US commercial claims database.
- OCS use was classified as
  - **High**: ≥1 fill of ≥30 days, or ≥6 bursts of OCS (days of supply ≤15)
  - **Low**: no OCS fills with days of supply ≥ 30, and < 2 bursts
- Patients with COPD were excluded.
- Outcomes of interest were all-cause and asthma-related utilization and cost.
- "Asthma-related" defined by claims with a primary diagnosis of asthma (and including asthma medications as an asthma related cost).

Statistical Analysis

- Survival analyses to account for differential follow-up
- Analysis of covariance (ANCOVA) and logisitic regression were used to compare high and low OCS groups, adjusted by age, gender, race, region, usual physician specialty, Charlson Comorbidity Index, pneumonia or influenza hospitalization, and EPR3 step therapy.[1]
- All statistical analyses used SAS® version 9.4

RESULTS

FIGURE 1. Cohort Selection

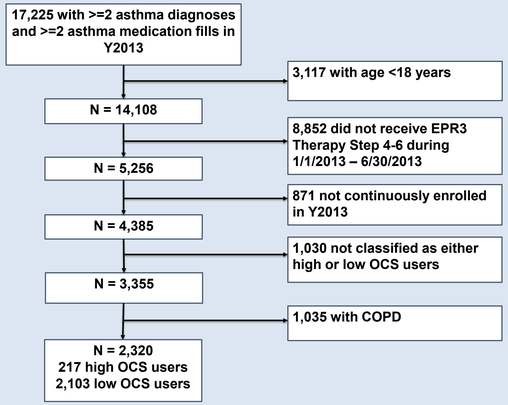


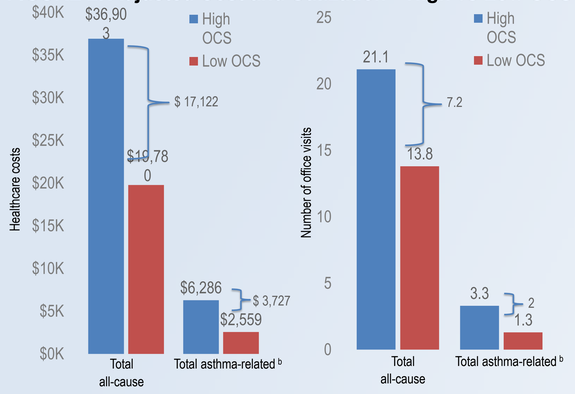
TABLE 1. Baseline Characteristics

Mean (SD) unless otherwise noted	High OCS Users N = 217; 9.4%	Low OCS Users N = 2,103; 90.6%	*P* Value
Age, year	56.8 (14.7)	54.6 (16.2)	0.057
Female, no. (%)	155 (71.4)	1,364 (64.9)	0.053
Charlson Comorbidity Index	2.2 (1.8)	2.0 (1.7)	0.048
Number of chronic conditions	5.3 (2.4)	4.4 (2.2)	<.001
EPR3 Therapy Step [a] no. (%)			<.001
Step 4	128 (59.0)	1,506 (71.6)	
Step 5/6	89 (41.0)	597 (28.4)	

[a] using pharmacy claims in first 6 months of study period

- Mean unadjusted total healthcare cost was $63,939 for high OCS users and $27,494 for low OCS users (p<0.001)
- Mean unadjusted asthma-related healthcare costs was $7,595 for high OCS users and $2,864 for low OCS users (p<0.001)
- Adjusting for demographics, clinical characteristics and disease severity:
  - Mean total healthcare cost for high OCS users was $17,122 (p<0.001) more than low OCS users, asthma related costs were $3,727 (p<0.001) more
  - High OCS users had an excess of 7.2 (p<0.001) HCP office visits and 2.0 (p<0.001) asthma-related office visits in a year (figure 1)
  - The odds of hospitalization (overall and asthma-related) were higher in high OCS patients, as was the rate of overall ED visits (but not asthma-related ED visits) Table 2

FIGURE 2. Adjusted Cost and Utilization—High vs Low OCS[a]

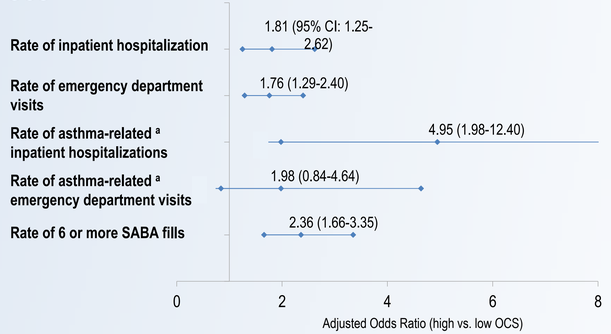


P Value of all comparisons were <0.001

[a] All except risk of inpatient hospitalization, risk of asthma-related inpatient hospitalization, and risk of asthma-related ED visit adjusted by age, gender, race (Caucasian vs non-Caucasian), region, usual physician specialty, Charlson comorbidity index, pneumonia or influenza hospitalization, and EPR3 step therapy, For those 3 risk models, pneumonia or influenza hospitalization not included as covariate.

[b] Claims with primary diagnosis of asthma or asthma medications

TABLE 2. Adjusted Odds Ratio for Utilization – High vs Low OCS



[a] Claims with primary diagnosis of asthma

CONCLUSIONS

- Before adjustment, total all-cause and asthma related utilization was higher among patients with at least 1 OCS fill ≥ 30 days or multiple bursts of OCS (high users) than low OCS users.
- After multivariate adjustment, both total and asthma-related annual cost remained twice as high in the high OCS group (p<.001). Utilization, including hospitalization and office visits, remained significantly higher as well for most categories.
- High-OCS exposure may be a marker for lack of asthma control and resultant increase in resource use and costs.
- This simple exposure variable may be useful for identifying a group of high cost/high utilization asthma patients.

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