Clinical Outcomes in Patients with Persistent Asthma by Attainment of Healthcare Effectiveness and Data Information Set (HEDIS) Measures

Giselle Mosnaim,[1] Rinat Ariely,[2] Michael DePietro,[2] Aimee Near,[3] Huan Huang,[3] Alberto Batista,[2,4] Kathy Lang[3]

[1]Department of Medicine, NorthShore University HealthSystem, Evanston, Illinois, USA; [2]Teva Pharmaceutical Industries, Frazer, PA, USA; [3]Real World Insights, IQVIA, Cambridge, MA, USA; [4]Jefferson College of Population Health, Philadelphia, PA, USA

INTRODUCTION

- Asthma is a chronic disease characterized by respiratory symptoms and exacerbations, or episodes of progressively worsening shortness of breath, cough, wheezing, and chest tightness.[1,2]
- A key goal of asthma therapy is obtaining and maintaining control of symptoms; poorly controlled asthma is associated with increased emergency department (ED) visits, hospitalizations and medical costs.[1,3]
- The Healthcare Effectiveness Data and Information Set (HEDIS) measures specific to asthma, maintained by the National Committee for Quality Assurance (NCQA), serve as useful constructs for evaluating the impact of interventions aimed at asthma control on clinical and economic patient outcomes.
- This retrospective, real-world study used linked data between two secondary databases to evaluate the impact of two HEDIS measures, Medication Management (MM) and Asthma Medication Ratio (AMR), on the burden of asthma in adult and pediatric patients stratified by attainment of a satisfactory HEDIS score.
- Here we describe the characteristics and clinical outcomes of patient populations that attained and did not attain satisfactory HEDIS scores, to uncover areas of unmet need among the asthma population.

METHODOLOGY

Data sources

- This retrospective cohort analysis used patient-level data from IQVIA's Real-World Data Adjusted Claims – US™ database (formerly known as PharMetrics Plus™) linked to ambulatory electronic medical records (EMR) data:
  - The claims database comprises adjudicated claims for more than 150 million unique patients across the US, with approximately 40 million active patients in the most recent calendar year who have both pharmacy and medical coverage.
  - The EMR database comprises over 60 million patient records sourced from "opt-in" provider research networks. The aggregated database comprises records collected across over 70,000 physicians. Approximately 50% of the contributing physicians are primary care practitioners and the remaining are specialists.

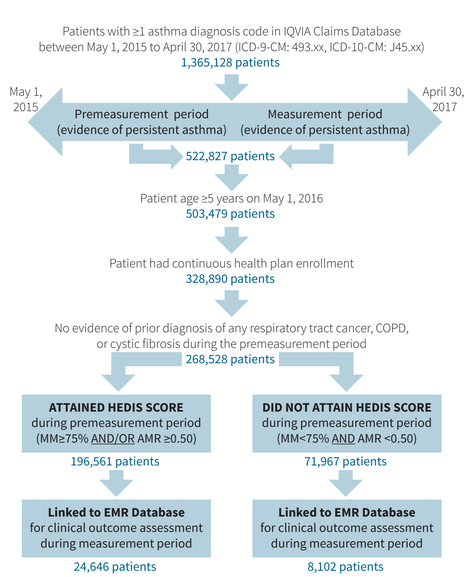
Study outcomes

- For each cohort, the following outcomes were evaluated during the measurement period:
  - Asthma hospitalization: defined as any hospitalization claims/encounters with an asthma diagnosis code
  - Asthma ED visit: defined as any ED claim or EMR ED encounter with an asthma diagnosis code
  - Corticosteroid burst: defined, as previously,[4] as pharmacy claim or prescription order for a systemic corticosteroid of at least 3 days, but less than 14 days
  - Asthma exacerbation: defined as any claim or appearance in EMR with exacerbation-related ICD-9-CM codes 493.02, 493.12, 493.22, 493.92, or ICD-10-CM codes J45.21, J44.1, J45.901 or an asthma hospitalization, asthma ED visit or corticosteroid burst as defined above
  - Satisfactory HEDIS score attainment (attained/not attained).

Patient selection

- Patients were identified as shown in **Figure 1**.

Figure 1. Patient attrition



EVIDENCE OF PERSISTENT ASTHMA was defined according to the HEDIS criteria[6-8] as meeting at least one of the following:

- **At least 1 ED visit with asthma as the principal diagnosis**
- **At least 1 hospitalization with asthma as the principal diagnosis**
- **At least 4 outpatient asthma visits with asthma as 1 of the listed diagnoses, plus at least 2 asthma medication dispensing events (asthma medications include relievers, controllers, and systemic corticosteroids)**

OR

- **At least 4 asthma-medication-dispensing events in a 12-month period.**

ATTAINMENT OF A SATISFACTORY HEDIS SCORE was defined[8] as:

- **Medication Management (MM): evidence of treatment with appropriate asthma control medications for at least 75% of days during a 12-month period**

AND/OR

- **Asthma Medication Ratio (AMR): evidence of a ratio of controller medications to total asthma medications of 0.50 or greater during a 12-month period.**

Statistical analyses

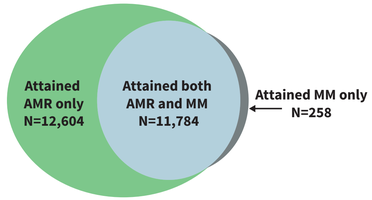
- Statistical tests were conducted for all measures between the two cohorts. p-values were calculated using the Chi-square test for categorical variables, and the Wilcoxon rank sum test or t-test for continuous variables, depending on the distribution of data. Statistical tests were two-sided, with an α-level of 0.05 for statistical significance.
- Multivariate logistic regression was conducted to identify factors associated with attainment of a satisfactory HEDIS score during the measurement period and asthma exacerbation, controlling for demographic and clinical characteristics, and attainment of a satisfactory HEDIS score during the premeasurement period.

RESULTS

Patient cohorts

- 32,748 patients were identified for the study: 24,646 patients who attained ≥1 satisfactory HEDIS score during the premeasurement period (attained cohort; **Figure 2**), and 8,102 patients who did not (not-attained cohort).

Figure 2. Specific HEDIS score attainment



Patient demographic and clinical characteristics

- The two cohorts were similar in terms of age and gender, with a mean age of 40–42 years and approximately 60% were female (**Table 1**).
- Comparing the 2 cohorts, the attained cohort had:
  - A higher proportion of patients who were white (92.8% vs. 87.2%, where race was known), on a Preferred Provider Organization (PPO) health plan (81.0% vs. 69.9%), and commercially insured (93.9% vs. 84.0%); all p<0.01
  - A lower proportion of patients who were from the West (5.7% vs. 12.1%), had a Health Management Organization (HMO) plan (14.7% vs. 26.2%), and were on Medicaid (5.9% vs. 15.7%); all p<0.01.
- The two cohorts were similar in terms of mean Charlson Comorbidity Index (CCI) and Body Mass Index (BMI) (**Table 1**).

Healthcare utilization during the premeasurement period

- Fewer patients in the attained cohort had evidence of only visiting a Primary Care Physician (PCP) compared to the not-attained cohort (55.1% vs. 69.3%) (**Table 2**).
- More patients in the attained cohort had evidence of both a PCP and asthma specialist visit (29.2% vs. 15.8%).
- The attained cohort was more likely to visit an asthma specialist (with or without a visit to a PCP) (33.5% vs. 17.6%), with allergist/immunologist visits more common compared to pulmonologist visits (23.5% vs. 12.1%) within the attained cohort.

Table 1. Patient demographic and clinical characteristics during the premeasurement period

Demographics	Attained (N = 24,646)	Not attained (N = 8,102)
Age (years)		
Mean (SD)	41.5 (18.7)	39.9 (17.0)
Gender (n, %)		
Female	15,326 (62.2%)	4,856 (59.9%)
Male	9,320 (37.8%)	3,246 (40.1%)
Race (n, %)		
White	12,626 (51.2%)	3,597 (44.4%)
African American	538 (2.2%)	308 (3.8%)
Hispanic	122 (0.5%)	77 (1.0%)
Asian	117 (0.5%)	36 (0.4%)
Other	199 (0.8%)	105 (1.3%)
Unknown[1]	11,044 (44.8%)	3,979 (49.1%)
US region (n, %)		
South	8,682 (35.2%)	2,513 (31.0%)
Midwest	7,280 (29.5%)	2,210 (27.3%)
Northeast	7,277 (29.5%)	2,398 (29.6%)
West	1,407 (5.7%)	981 (12.1%)
Health plan type (n, %)		
PPO	19,954 (81.0%)	5,662 (69.9%)
HMO	3,631 (14.7%)	2,126 (26.2%)
POS	853 (3.5%)	264 (3.3%)
Indemnity	208 (0.8%)	50 (0.6%)
Payer type (n, %)		
Commercial	23,143 (93.9%)	6,807 (84.0%)
Medicaid	1,462 (5.9%)	1,269 (15.7%)
Medicare	41 (0.2%)	26 (0.3%)
Charlson Comorbidity Index		
Mean (SD)	1.2 (1.1)	1.3 (1.3)
Body Mass Index (kg/m^2)		
Mean (SD)	29.2 (8.1)	29.9 (7.9)

[1]Race information missing in the EMR linked data
HMO, health maintenance organization; POS, point of service; PPO, preferred provider organization

Table 2. Patient healthcare utilization during the premeasurement period

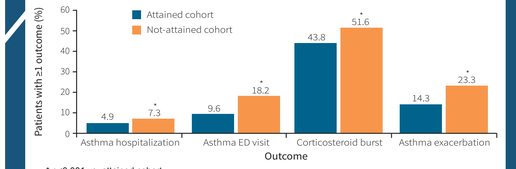
Healthcare utilization	Attained (N = 24,646)	Not attained (N = 8,102)
Evidence of both PCP and asthma specialist visit (n, %)	7,206 (29.2%)	1,284 (15.8%)
PCP + pulmonologist visit (n, %)	2,687 (10.9%)	673 (8.3%)
PCP + allergist/immunologist visit (n, %)	4,987 (20.2%)	692 (8.5%)
PCP visit only (n, %)	13,575 (55.1%)	5,613 (69.3%)
Asthma specialist visit only (n, %)	1,054 (4.3%)	143 (1.8%)
Pulmonologist visit only (n, %)	285 (1.2%)	41 (0.5%)
Allergist/immunologist visit only (n, %)	801 (3.3%)	103 (1.3%)

PCP, primary care physician

Outcomes during the measurement period

- Comparing the 2 cohorts, the attained cohort had:
  - A lower proportion of patients with ≥1 asthma hospitalization (4.9% vs. 7.3%), asthma-related ED visit (9.6% vs. 18.2%), corticosteroid burst (43.8% vs. 51.6%) or asthma exacerbation (14.3% vs. 23.3%); all p<0.01 (**Figure 3**)
  - More patients that achieved satisfactory MM and/or AMR during the measurement period (MM=44.9%, AMR=93.0%) compared to the not-attained cohort (MM=4.8%, AMR=27.1%); p<0.01.
- Multivariate logistic regression analyses suggested that:
  - Satisfactory HEDIS score attainment during the premeasurement period was associated with a lower likelihood of asthma exacerbation odds ratio [OR]=0.56; 95% CI: 0.52–0.59)
  - The odds of patients achieving a satisfactory HEDIS score during the measurement period were 1.4 times higher if the patient had ≥1 visit to an asthma specialist during the prior 12-month period (OR=1.42; 95% CI: 1.29–1.56)
  - Patients who attained a satisfactory HEDIS score previously had a much higher likelihood of attaining a satisfactory score again during the measurement period (OR=33.9; 95% CI: 31.5–36.4).

Figure 3. Clinical outcomes during the measurement period



* p<0.001 vs. attained cohort

CONCLUSIONS

- Asthma patients who attained satisfactory HEDIS scores were more likely to be white, participate in a PPO vs. an HMO, and be commercially insured. Patients on Medicaid had a lower frequency of satisfactory HEDIS score attainment.
- Patients who attained satisfactory HEDIS scores were more likely to have had at least one visit to an asthma specialist during that period, while patients who did not attain a satisfactory score were more likely to have only visited a PCP and were also more likely to continue attaining HEDIS scores in the follow-up period, indicating that increased quality of care may have a persistent effect on outcomes long term.
- Patients who attained satisfactory HEDIS scores had better clinical outcomes, including fewer asthma hospitalizations, asthma-related ED visits, and exacerbations.
- These findings highlight the importance of monitoring adherence and persistence in asthma treatment; suggesting that it may be beneficial for PCPs to partner with asthma specialists to better achieve quality metrics, reduce exacerbations, and ultimately lower associated healthcare-resource utilization among asthma patients.

Acknowledgments

This analysis was sponsored by Teva Pharmaceuticals. Medical writing support for the development of this poster was provided by Andy Shaw, PhD, of Ashfield Healthcare Communications, part of UDG Healthcare plc, and was funded by Teva Pharmaceuticals.

Disclosures

Dr. Mosnaim receives research grant support from GlaxoSmithKline and Propeller Health; owns stock options in Electrocore; and serves as a consultant and/or member of a scientific advisory board for Electrocore, GlaxoSmithKline, Teva, Novartis, AstraZeneca, Boehringer Ingelheim and Propeller Health. Dr. Mosnaim received payment for scientific consulting services from Teva for data analysis and interpretation for this poster.

References

1. National Asthma Education and Prevention Program TEPotDaMoA. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. 2007.
2. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2017.
3. Center for Disease Control and Prevention. Asthma Facts. CDC's National Asthma Control Program Grantees. 2013.
4. Lang K, et al. Eur Respir J 2016;48:PA4212.
5. Broder MS, et al. Am J Manag Care 2010;16:170–8.
6. Jacob C, et al. Eur J Health Econ 2017;18:227–41.
7. Raimundo K, et al. Presented at: AMCP 26th Annual Meeting 2014.
8. Yoon AC, et al. J Allergy Clin Immunol Pract 2015;3:547–52.

Presented at the AAE Annual Conference, Phoenix, Arizona, USA, July 20–22, 2018

Support for this study was provided by Teva Pharmaceuticals