Poor Symptom Control Among Moderate-to-Severe Asthma Patients Who Adhere to Guideline-Driven Therapy

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BACKGROUND

- In the United States, asthma is a common condition that affects 15-20 million individuals, and the number of individuals with self-reported asthma has doubled in less than 2 decades.[1,2]
- In 2004, direct healthcare costs associated with asthma totaled more than $11.5 billion and indirect costs totaled $4.6 billion.[1]
- Due to the increasing prevalence and associated personal and public health costs, an important finding is that costs are more than two times higher for asthma patients with uncontrolled symptoms than those with controlled symptoms.[3]

OBJECTIVES

The objectives of this study were to:

- Identify the proportion of moderate-to-severe asthma patients who, after receiving maximum guideline-driven therapy, continued to experience poor symptom control; and
- Evaluate whether patients who are highly adherent to high-dose fluticasone/salmeterol continue to experience poor symptom control.

METHODS

Study Design:

- This was a retrospective cohort analysis using administrative medical and pharmacy claims data.

Data Source:

- A HIPAA-compliant U.S. claims database of 13-14 million lives

Eligibility Criteria:

Inclusion Criteria

- Age 12-64 years
- At least 1 medical claim with an *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) code that represented asthma (493.xx)
- At least 1 pharmacy claim with a *National Drug Code* (NDC) representing fluticasone 500 mcg/salmeterol 50 mcg during the identification period
- Newly treated with fluticasone 500 mcg/salmeterol 50 mcg

Exclusion Criteria

- Any medical claims with an ICD-9-CM code that represented chronic obstructive pulmonary disease (COPD; 491.xx, 492.xx, 496.xx)
- Any claims with an NDC or J code that represented omalizumab use

Study Timeframes:

- **Identification Period** – July 1, 2003 through June 30, 2004
- **Preindex Period** – One-year period prior to the index date
- **Postindex Period** – One-year period after the index date

Study Definitions:

- Index date - the date of the first pharmacy claim with an NDC code representing fluticasone 500 mcg/salmeterol 50 mcg
- Newly treated with fluticasone 500 mcg/salmeterol 50 mcg – no pharmacy claims with an NDC code representing fluticasone 500 mcg/salmeterol 50 mcg during the preindex period
- Poor symptom control - having one or more medical claims for an emergency department (ED) encounter or inpatient hospitalization for asthma, or six or more pharmacy claims with an NDC representing SABA use, or two or more pharmacy claims with an NDC representing oral corticosteroids (OCS) use
- Medication Compliance – the sum of the "day's supply" for all fluticasone 500 mcg/salmeterol 50 mcg fills divided by 365

Analysis:

Patients were placed in 1 of 6 mutually exclusive hierarchical categories that described asthma controller medication use during the preindex period.

The change (preindex to postindex) in the proportion of patients with poor symptom control was evaluated for all patients and a subset of patients with a compliance level over 75%.

Descriptive statistics, including means and standard deviations, were calculated for study variables. The statistical significance of the change in the proportion of patients with poor symptom control was tested using McNemar's test. All statistical analyses were performed using SAS software V9, SAS Institute, Cary, NC.

Primary Outcome Metrics:

Among all patients and the subgroup of patients with compliance ≥ 75%:

- The preindex to postindex change in the proportion of patients who experienced poor symptom control

RESULTS

Table 1 - Baseline Characteristics

	All Patients n=3,357	Patients with 75% or higher compliance n=645
Age, mean (SD)	40.2 (13.6)	44.0 (12.5)
Age (yrs) cohorts	n (%)	n (%)
12 - 24	533 (15.9)	55 (8.5)
25 - 34	481 (14.3)	83 (12.9)
35 - 44	858 (25.6)	164 (25.4)
45 - 54	943 (28.1)	201 (31.2)
55 - 64	542 (16.1)	142 (22.0)
Female gender	2,151 (64.1)	398 (61.7)
Preindex Medication Use		
Fluticasone/salmeterol 250 mcg/50 mcg	1,688 (50.3)	369 (57.2)
Fluticasone/salmeterol 100 mcg/50 mcg	303 (9.0)	44 (6.8)
ICS+LABA	180 (5.4)	47 (7.3)
ICS+LTRA	198 (5.9)	35 (5.4)
ICS Only	470 (14.0)	51 (7.9)
Other Controllers	518 (15.4)	99 (15.4)

Table 2 - Proportion of patients with poor symptom control - Entire cohort

		Patients who were newly treated with fluticasone/salmeterol 500/50 mcg N=3,357				
		Asthma-related hospitalization*	Asthma-related ED encounter*	≥ 6 SABA prescription claims*	≥ 2 OCS prescription claims*	Any of the poor control indicators*
Patients with poor asthma control during preindex period	n (%)	275 (8.2)	416 (12.4)	453 (13.5)	537 (16.0)	1,245 (37.1)
Patients with poor asthma control during postindex period	n (%)	215 (6.4)	299 (8.9)	346 (10.3)	423 (12.6)	994 (29.6)

**Statistically significant preindex to postindex changes ($p \leq 0.001$)*
Note: Patients may have more than 1 poor control indicator

Table 3 - Proportion of patients with poor symptom control - Patients with 75% or higher compliance

		Patients who were newly treated with fluticasone/salmeterol 500/50 mcg N=645				
		Asthma-related hospitalization*	Asthma-related ED encounter*	≥ 6 SABA prescription claims*	≥ 2 OCS prescription claims*	Any of the poor control indicators*
Patients with poor asthma control during preindex period	n (%)	44 (6.8)	61 (9.5)	110 (17.1)	109 (16.9)	241 (37.4)
Patients with poor asthma control during postindex period	n (%)	23 (3.6)	50 (7.8)	79 (12.2)	95 (14.7)	198 (30.7)

**Statistically significant preindex to postindex changes ($p \leq 0.001$)*
Note: Patients may have more than 1 poor control indicator

DISCUSSION

- Our results highlight that a significant proportion of moderate-to-severe asthma patients continue to have evidence of poor symptom control despite treatment according to guidelines. In the 12 months after initiation of treatment with fluticasone 500 mcg/salmeterol 50 mcg, 29.6% of patients continued to have evidence of poor symptom control. Among a subgroup of patients highly compliant to therapy, 30.7% had evidence of poor symptom control.
- Although use of administrative claims data from managed care allows the study of large populations, clinical information is inherently lacking. Utilizing claims data to determine the proportion of patients with poor symptom control is likely to be underestimated based on this definition, given the lack of information on patient-reported symptom control. In addition, coding errors (ICD-9-CM and NDC) also may affect data integrity.

CONCLUSION

- This study demonstrates that even after treatment with maximum guideline-driven therapy and medication compliance, some patients continue to experience poor symptom control.
- This represents an unmet need in the treatment of asthma that medication compliance does not address among patients with moderate-to-severe asthma.

REFERENCES

1. American Lung Association. Epidemiology & Statistics Unit RaPS. *Trends in Asthma Morbidity and Mortality May 2005* 2005.
2. Redd SC. Asthma in the United States: burden and current theories. *Environ Health Perspect*. Aug 2002;110 Suppl 4:557-560.
3. Sullivan SD. The burden of uncontrolled asthma on the U.S. health care system. *Manag Care*. Aug 2005;14(8 Suppl):4-7; discussion 25-27.

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