

Relationship Between Allergy Immunotherapy Treatment Patterns, Clinical Characteristics, and Healthcare Costs: A Claims Analysis of Allergic Rhinitis Patients

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Background

The prevalence of allergic diseases has increased worldwide over the past 50 years, particularly among young children.¹ In the US alone, allergic rhinitis (AR) affects 40-60 million people.² Up to 30% of American adults have AR, meaning AR affect about a third of the US workforce making AR a leading cause of workdays lost, with over 130 million workdays lost per year.³⁻⁵ The economic impact of AR in the US is significant, with estimates at nearly \$3.4 billion annually.⁶ By modifying the underlying cause of the disease allergy immunotherapy (AIT) is the only causal treatment of AR and has been shown to be an effective treatment for reducing both symptoms of AR as well as the use of symptom relieving medication.⁷ In addition studies have shown an economic benefit associated with AIT.^{8,9} However, there remains a lack of real-world evidence gathered on treatment adherence, symptom relieving medication, and clinical outcomes among patients prescribed AIT.

Objective

To better understand current treatment patterns, healthcare costs and patient outcomes associated with AIT in the United States.

Methods

Sample Selection

This study was an observational, retrospective study of de-identified healthcare claims from the IBM MarketScan Commercial Database from January 1, 2014, through March 31, 2018. All patients were required to present ≥ 1 medical or pharmacy claim for AIT, or ≥ 1 non-diagnostic claim with a diagnosis of AR (ICD-9-CM 477.x or ICD-10-CM J30.x).

Patients with ≥1 claim for AIT comprised the AIT user cohort, with their earliest service date for an AIT claim serving as the index date. Patients without evidence of AIT comprised the non-AIT cohort, with the earliest service date for a claim with AR as their index date. All patients were required to present at least 12 months of continuous enrollment prior to and following the index date. Patients with a claim for venom allergies were excluded.

Outcomes

Patient demographics were assessed on the index date.

Conditions typically comorbid with AR were assessed during the pre- and post-index periods (asthma, atopic dermatitis, conjunctivitis). The Charlson Comorbidity Index, all-cause and allergic rhinitis-specific healthcare resource utilization and costs were assessed during the 12-month baseline and 12-month follow-up period.

Patient Cohorts

Four patient cohorts were identified:

- No AIT fills - All patients with an AR diagnosis code and no AIT claim
- Any AIT fill - All patients with AR and at least one AIT claim; this group was further segmented based on the number of AIT claims observed during the post-period:
 - 1 AIT claim
 - 6+ AIT claims

Analyses

Descriptive statistics were reported for all outcome measures and presented for the four cohorts. Differences in comorbidities were compared between groups via chi-square tests.

Results

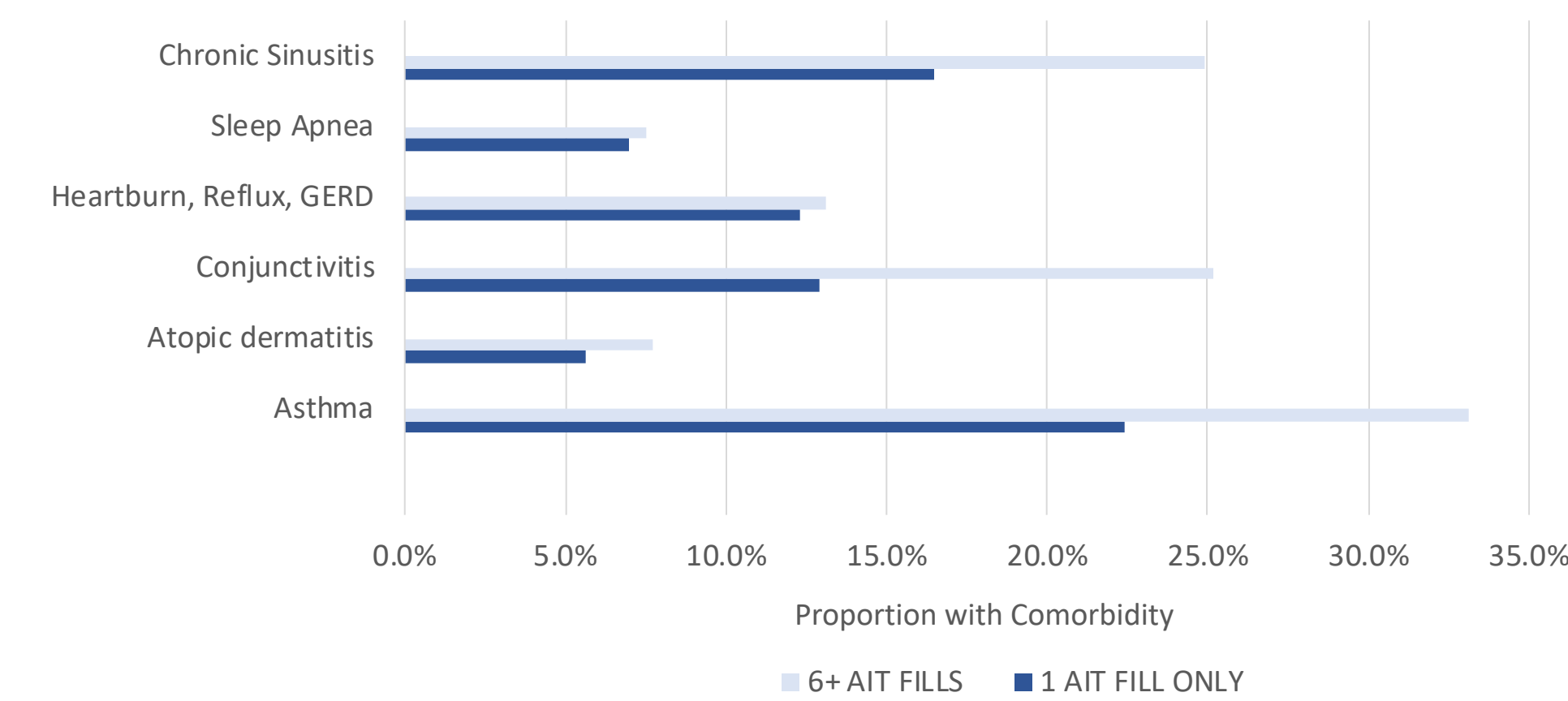
Table 1. Patient Demographics

	NO AIT FILLS N = 2,231,323		ANY AIT FILLS N = 103,207		1 AIT FILL ONLY N = 16,278		6+ AIT FILLS N = 71,580	
	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD
Age (Mean, SD)	32.0	19.2	34.2	17.3	35.2	17.1	33.6	17.5
Age Categories (N, %)								
<5	185,838	8.3%	1,604	1.6%	437	2.7%	923	1.3%
5-11	288,589	12.9%	12,867	12.5%	1,557	9.6%	10,055	14.0%
12-17	202,743	9.1%	10,609	10.3%	1,376	8.5%	8,034	11.2%
18-65	1,554,153	69.7%	78,127	75.7%	12,908	79.3%	52,568	73.4%
Sex (N, %)								
Male	973,797	43.6%	43,162	41.8%	6,455	39.7%	30,621	42.8%
Female	1,257,526	56.4%	60,045	58.2%	9,823	60.3%	40,959	57.2%

2,334,530 AR patients qualified for the study; 103,207 received AIT, with 16,278 of these in the 1 AIT claim group, and 71,580 in the 6+ claims group. The remaining 2,231,323 patients had no AIT claims. The cohorts were similar demographically, with mean patient ages in the early 30s with a relatively even split between early and middle adulthood (Table 1).

The 6+ AIT claims group presented significantly higher rates of the majority of comorbidities assessed at baseline compared to 1 AIT claims group, including asthma (33.1% vs. 22.4%), conjunctivitis (25.2% vs. 12.9%), and chronic sinusitis (24.9% vs. 16.5%, *ps* < 0.001; Figure 1).

Figure 1. Pre-existing Comorbidities at Baseline



During the baseline period, AIT patients were more likely to fill prescription antihistamines (16.8% vs. 4.7%), decongestants (28.9% vs. 6.2%), and intranasal corticosteroids (36.9% vs. 11.3%), and to have an AR-related surgical procedure (4.1% vs. 0.9%). AIT patients also presented a baseline Charlson score which was twofold higher than the non-AIT group (0.45 ± 0.76 vs. 0.22 ± 0.66).

During the post-index period, non-AIT patients incurred lower total healthcare costs compared to AIT (mean ± SD; \$7,815±\$27,041 vs. \$11,612±\$27,797; Figure 2). Though increases in total healthcare costs were observed from pre- to post-index across all cohorts, the percentage changes were notably higher for the non-AIT group compared to AIT groups, with similar increases among the 1 and 6+ claims groups (Figure 2).

Figure 2. Pre- and Post-Index Period Total Healthcare Costs By Cohort

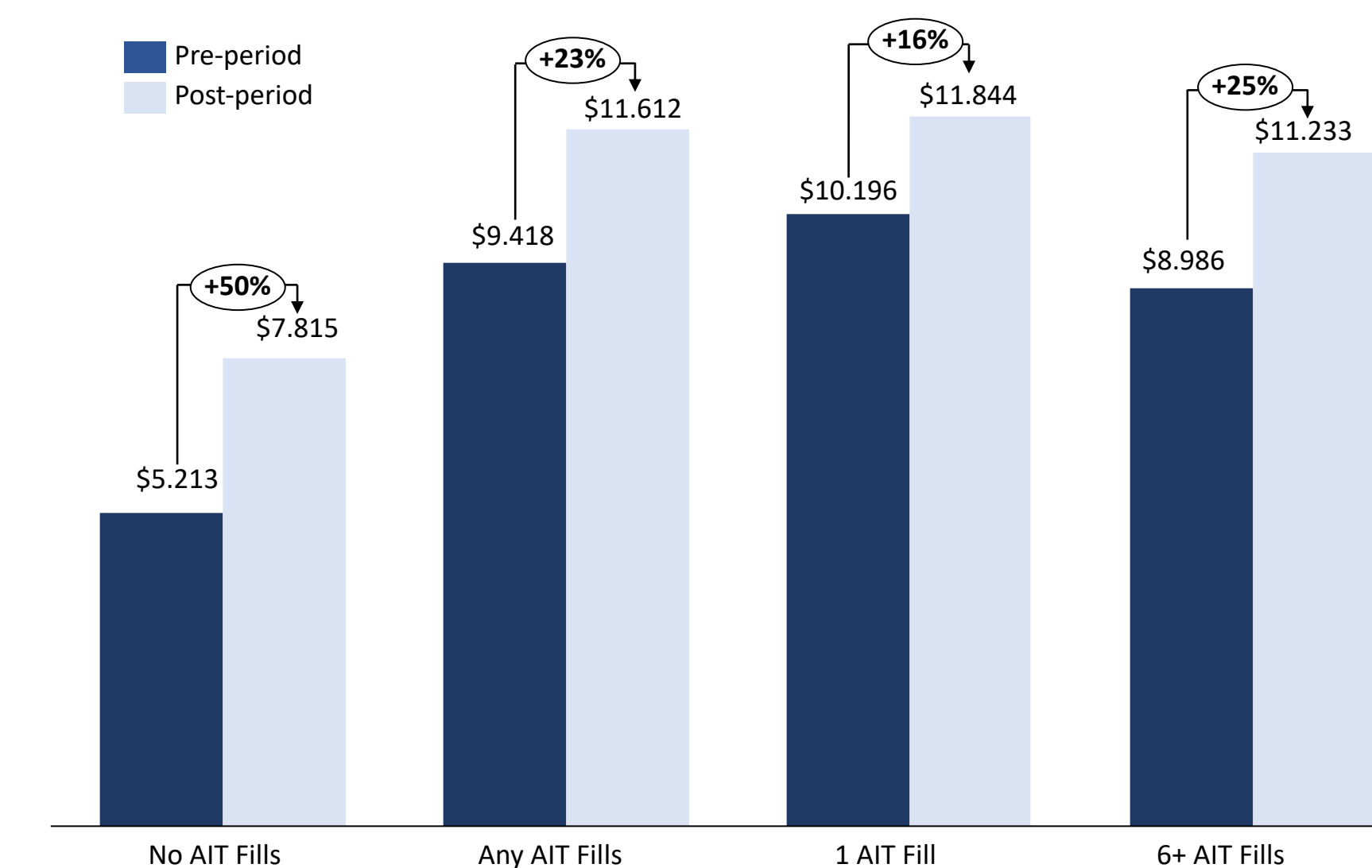
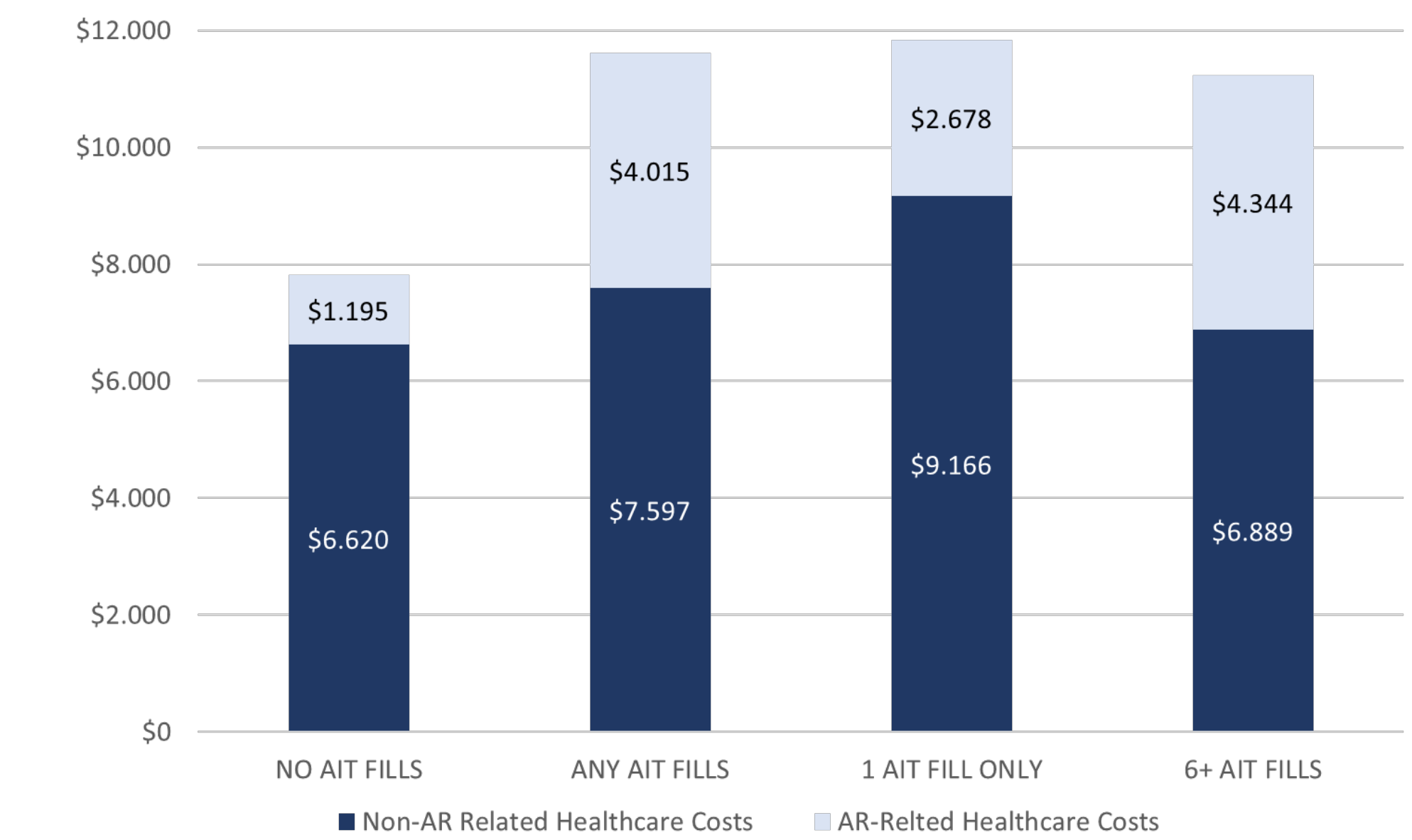


Figure 3. Post-Index Healthcare Cost : AR-Related and All-Cause By Cohort



Healthcare utilization was similar for most service categories between AIT and non-AIT cohorts, though AIT patients were more likely to visit a specialist compared to non-AIT patients (58.7% vs. 26.3%), and also were more likely to have a surgical procedure (4.1% vs. 2.2%). Regardless, AIT-related expenditure did not account for a significant portion of total healthcare expenditure, though was greater among AIT patients (Figure 3).

References
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Conclusion

Patients on AIT with more allergy-related comorbidities are more likely to continue AIT for a longer period, as shown by the higher percentage who have 6+ AIT claims. This extended use did not translate into increased healthcare costs, showing a potential economic benefit of AIT for the management of AR. Prior studies suggest that the cost-effectiveness of AIT would continue to trend positively as patients were treated over a longer period.