Comparative Effectiveness of Asthma Monoclonal Antibody Therapy in Adults: An EHR-based, Propensity-Score-Matched Retrospective Cohort Study

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Introduction

- The landscape of moderate-to-severe asthma treatment continues to evolve as monoclonal antibody therapies or biologics emerge.
- Biologics demonstrably improve of asthma control by targeting key inflammatory pathways.
- Real-world comparative effectiveness of monoclonal antibody therapies **can inform optimized treatment selection** and provide clinicians **evidence-based recommendations** for when patients are eligible for multiple biologics.

Methods

- Electronic Health Record (EHR)-based retrospective cohort from Penn Medicine encounters for adults with a primary asthma ICD-10 diagnosis between January 1, 2017, and February 29, 2024.
- Encounters were limited to patients that were ever prescribed **Omalizumab**, **Mepolizumab**, **Benralizumab**, **Dupilumab**, or **Tezepelumab**.
- We computed **propensity scores** using logistic regression (models adjusted for sex, race, smoking, baseline treatment, allergic comorbidities, and Elixhauser comorbidity score).
- Negative binomial regression models with a 2:1 nearest neighbor matching were fit. We estimated the total number of **asthma-related exacerbations during follow-up**.

In propensity score matched models, Omalizumab and Mepolizumab were associated with fewer exacerbations compared to Dupilumab. Tezepelumab outperform Omalizumab.

example

Table 1: Pairwise Comparisons of Biologics for Asthma and their Adjusted Incidence Rate Ratios (IRRs).

	IRR(95% CI)
All Scores	0.70 (0.62, 0.77)
Actively Smoking (n=135)	0.71 (0.62, 0.78)
Non-Actively Smoking (n=57)	0.57 (0.34, 0.73)
Estimated Marginal Mean K (95% CI)	
Baseline	0.061 (0.043, 0.079)
12 months	0.066 (0.046, 0.086)
24 months	0.079 (0.063, 0.096)

Results

- Incidence rate ratios (IRRs) and 95% CI show the comparative effectiveness of the two biologics (Table 1).
- Results item two

Discussion

- Discussion point one
- Discussion point two