

Impact of Benralizumab on Asthma and COPD Exacerbation-Related Healthcare Resource Utilization in Patients with Asthma and Concomitant COPD

Supplemental Materials

Supplemental study methods

Study measures and outcomes

- Patient demographics and comorbidities were described during the 12-month pre-index period
- Definition of asthma and chronic obstructive pulmonary disease (COPD) exacerbations:
 - Asthma and COPD exacerbations were defined via a claims-based algorithm, outlined in **Table S1**
 - Asthma exacerbation or COPD exacerbation-related healthcare resource utilization (HRU) was defined as a unique encounter in the inpatient, emergency department (ED), or outpatient setting containing a day that met the asthma or COPD exacerbation criteria
- Rates of asthma exacerbation and COPD exacerbation-related HRU (i.e., unique encounters in the inpatient, ED, or outpatient setting) and medical costs per person-year (PPY) were compared between pre- and post-index periods
- Medical costs were estimated from charges using a cost-to-charge ratio of 0.2575 calculated from the Healthcare Cost and Utilization Project (HCUP) 2018 national hospital inpatient median charges and median medical costs.¹ Outliers were identified at the HRU encounter level separately for inpatient, ED, and outpatient charges, and replaced using the 1.5 times the interquartile range criterion

Statistical analysis

- Rates of exacerbation-related HRU were compared using generalized estimating equations (GEE), and medical costs were compared using Wilcoxon signed-rank tests

¹ Agency for Healthcare Research and Quality (AHRQ). HCUPnet - Healthcare Cost and Utilization Project. Rockville, MD. <https://hcupnet.ahrq.gov/>. Accessed 1 January 2022.

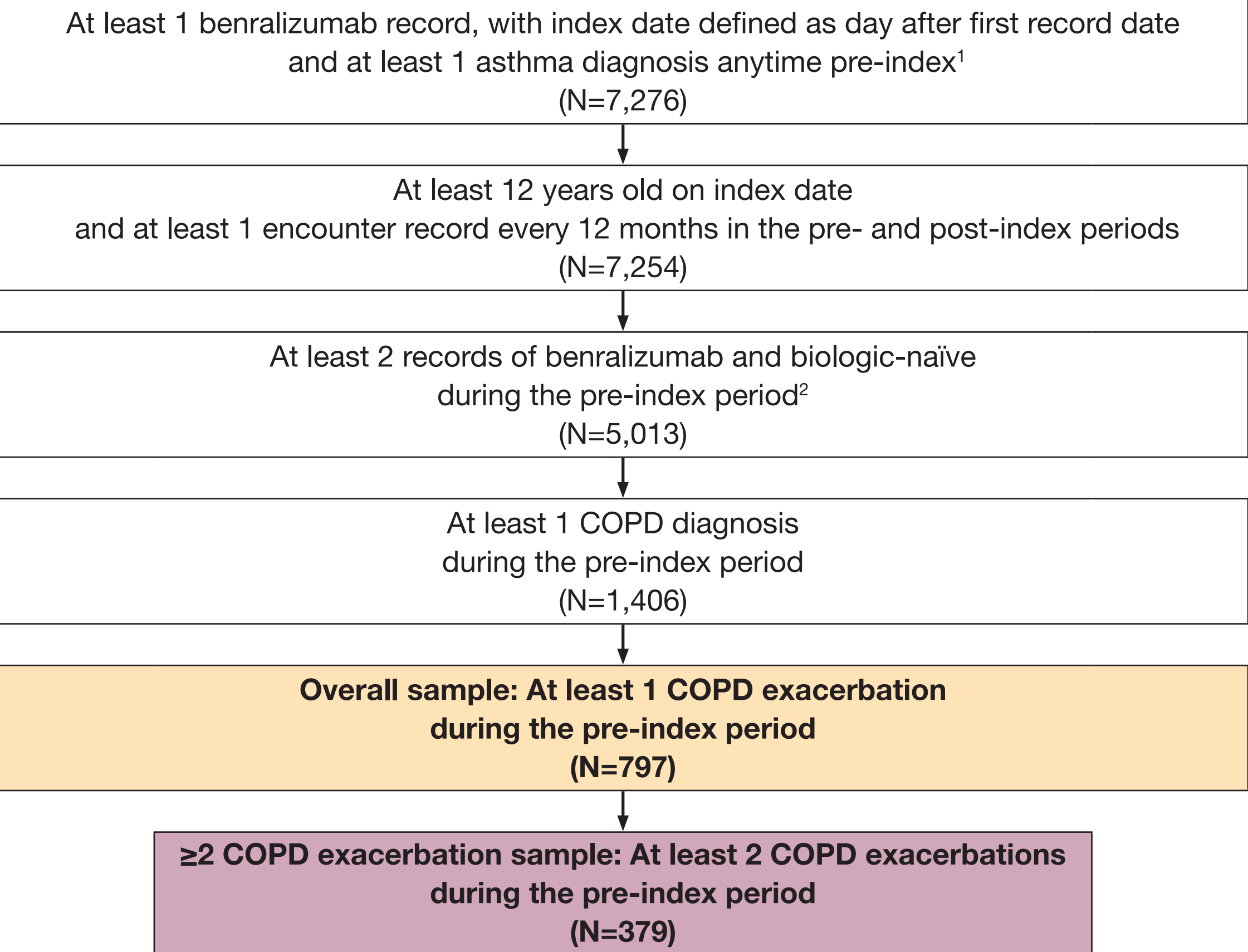
Supplemental results

- A total of 797 patients with ≥ 1 COPD exacerbation (overall sample) and 379 patients with ≥ 2 COPD exacerbations were selected following the steps in **Figure S1**
- Patient demographics and comorbidities during the 12 months pre-index period were summarized in **Table S2**

Table S1. Asthma and COPD exacerbation definition

Setting	Asthma exacerbation	COPD exacerbation
Inpatient	<ul style="list-style-type: none">• An asthma diagnosis code as the primary diagnosis	<ul style="list-style-type: none">• A COPD diagnosis code as the primary diagnosis
ED	<ul style="list-style-type: none">• An asthma diagnosis code AND• At least 1 claim for a systemic corticosteroid (with 3 to <30 days of supply or as a single injection) within ± 5 days of the visit AND• No diagnosis codes for COPD, acute myocardial infarction, congestive heart failure, or autoimmune diseases during the visit	<ul style="list-style-type: none">• A COPD diagnosis code AND• At least 1 claim for a systemic corticosteroid (with 3 to <30 days of supply or as a single injection) within ± 5 days of the visit AND/OR• At least 1 claim for an antibiotic within ± 5 days of the visit
Outpatient	<ul style="list-style-type: none">• An asthma diagnosis code AND• At least 1 claim for a systemic corticosteroid (with 3 to <30 days of supply or as a single injection) within ± 5 days of the visit AND• No diagnosis codes for COPD or autoimmune diseases during the visit	<ul style="list-style-type: none">• Same as ED

Figure S1. Sample selection diagram



Notes:
¹ The record for benralizumab occurring the day before the index day is included in the count of benralizumab records.
² Biologics included omalizumab, mepolizumab, reslizumab, and dupilumab.

Table S2. Patient demographics and baseline characteristics

Cohort	Overall sample (N = 797)	≥ 2 COPD exacerbations (N = 379)
Demographics		
Age on index date in years, mean \pm SD	60.91 \pm 12.04	62.07 \pm 11.73
Female, n (%)	497 (62.4%)	228 (60.2%)
Region, n (%)		
Midwest	198 (24.8%)	91 (24.0%)
Northeast	179 (22.5%)	89 (23.5%)
South	345 (43.3%)	162 (42.7%)
West	75 (9.4%)	37 (9.8%)
Comorbidities		
Charlson Comorbidity Index, mean \pm SD	2.04 \pm 1.55	2.20 \pm 1.66
Allergy-related comorbidities, n (%)		
Allergic rhinitis	339 (42.5%)	156 (41.2%)
Atopic dermatitis	13 (1.6%)	6 (1.6%)
Eczema	40 (5.0%)	20 (5.3%)
Other asthma-related comorbidities, n (%)		
Autoimmune diseases	95 (11.9%)	47 (12.4%)
Chronic idiopathic urticaria	1 (0.1%)	0 (0.0%)
Gastroesophageal reflux disease	358 (44.9%)	187 (49.3%)
Mental disorders	413 (51.8%)	239 (63.1%)
Nasal polyps	46 (5.8%)	17 (4.5%)
Obesity	280 (35.1%)	152 (40.1%)
Obstructive sleep apnea	300 (37.6%)	157 (41.4%)
Cardiovascular comorbidities, n (%)		
Congestive heart failure	132 (16.6%)	87 (23.0%)
Hyperlipidemia	404 (50.7%)	215 (56.7%)
Hypertension	526 (66.0%)	272 (71.8%)

Abbreviations

COPD: chronic obstructive pulmonary disease; **ED:** emergency department; **SD:** standard deviation.