

Treatment Patterns Among Individuals with Hereditary Angioedema in the United States

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Background

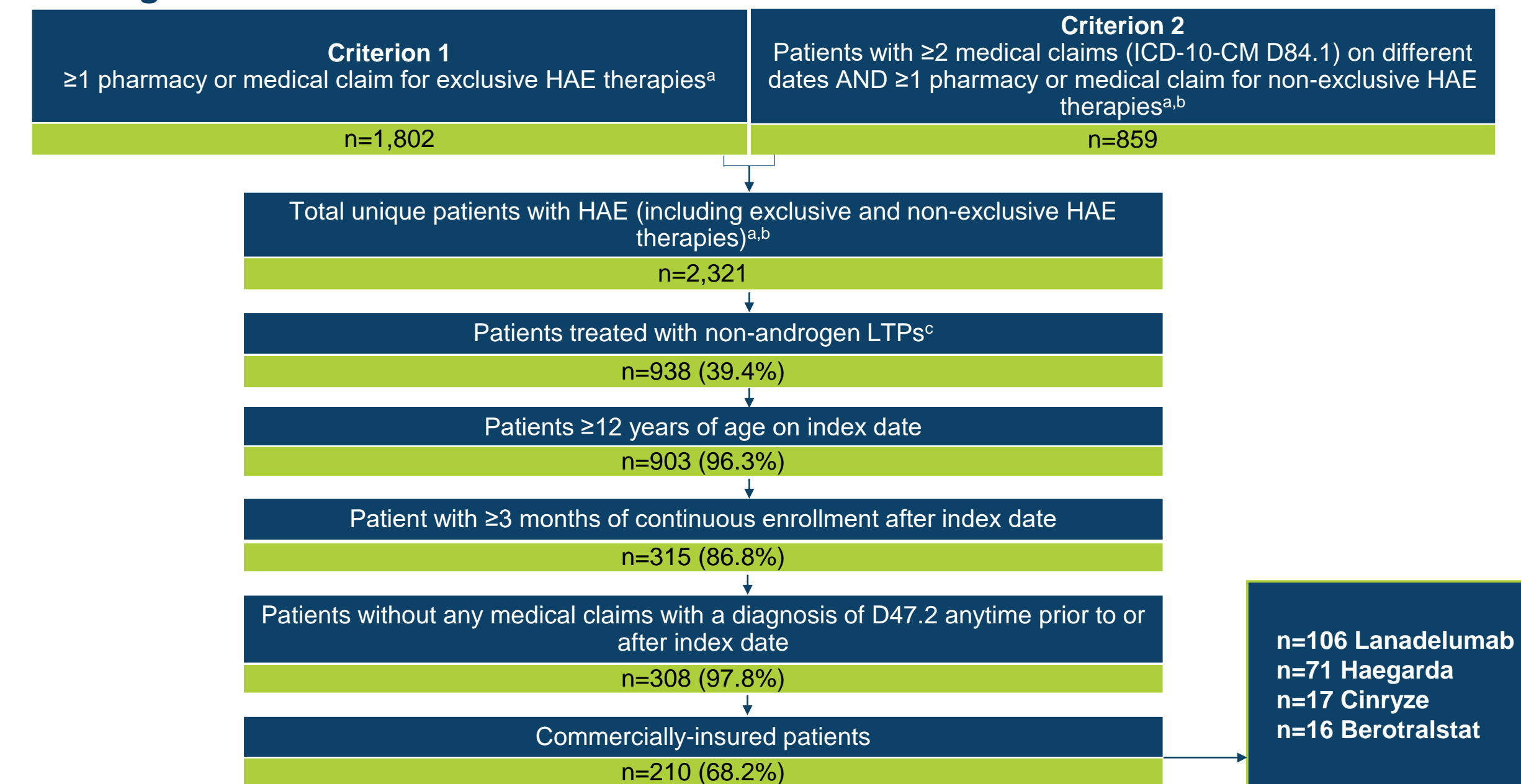
- Hereditary angioedema (HAE) is a rare, genetic disease characterized by unpredictable, debilitating swelling episodes (i.e., attacks) in various parts of the body¹
- Given the unpredictability of attack occurrence, global clinical guidelines recommend that all people living with HAE always have immediate access to ≥2 doses of an on-demand treatment for acute attacks²⁻⁵
- Over the past decade, the HAE therapeutic landscape has rapidly evolved; however, evidence on current treatment outcomes related to non-androgen long-term prophylactic (LTP) therapies based on claims data is limited
- This study sought to investigate real-world treatment patterns and healthcare resource use (HRU) among commercially-insured patients using non-androgen LTP in the United States (US)

Methods

- We conducted a retrospective cohort study using the IQVIA PharMetrics® Plus Database (April 1, 2017-March 31, 2022) to analyze treatment patterns and HRU in patients with HAE
- Our study included patients who had HAE types I or II, were ≥12 years at index (ie, date of first claim for a non-androgen LTP therapy), had ≥6 months of continuous enrollment (CE) before index, and ≥3 months of CE following index
- As there are no HAE-specific International Classification of Diseases (ICD) diagnosis codes, we used a claims-based algorithm⁶ to identify potential patients, which required either ≥1 claim for exclusive HAE therapies or ≥2 claims with HAE-related codes and ≥1 claim for other HAE medications
- Statistical analyses included descriptive measures such as mean ± standard deviation (SD), frequency, and percentage distributions. HRU was described as per patient year (PPY) with a 95% confidence interval (CI)
- This analysis examined outcomes among commercially-insured patients receiving non-androgen LTP (ie, lanadelumab, haegarda, cinryze, and berotralstat)

- The analytic cohort consisted of 210 patients (Figure 1)
- Patients had a mean age of 40.9 ± 14.1 years; 72% were female, and the most frequently used non-androgen LTP was lanadelumab (n=106, 50%) (Table 1)

Figure 1. Analytic Cohort Selection, Commercially-Insured Patients Receiving Non-Androgen LTPs



*Medications indicated exclusively for HAE included C1-INH, icatibant, ecallantide, lanadelumab, and berotralstat
 *Medications used non-exclusively to treat HAE included attenuated androgens, other androgens that may be used to treat HAE, fresh frozen plasma, tranexamic acid, and ε-aminocaproic acid
 *Non-androgen LTP therapies included C1-INH (Cinryze or Haegarda), lanadelumab, and berotralstat
 Abbreviations: HAE, hereditary angioedema; LTP, long term prophylactic; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Table 1. Analytic Cohort Patient Characteristics

	Total n=210	Lanadelumab n=106	Haegarda n=71	Cinryze n=17	Berotralstat n=16
Age (years)					
Mean ± SD	40.9 ± 14.1	42.1 ± 14.4	40.1 ± 13.4	35.5 ± 13.1	43.0 ± 15.5
Median (IQR)	41.7 (30.1, 52.1)	43.8 (30.2, 52.4)	39.7 (30.8, 51.1)	35.1 (26.0, 44.3)	49.9 (30.3, 53.1)
Female, n (%)	152 (72.4)	76 (71.7)	50 (70.4)	16 (94.1)	10 (62.5)
Geographic Region, n (%)					
South	100 (47.6)	54 (50.9)	33 (46.5)	8 (47.1)	5 (31.3)
Midwest	43 (20.5)	22 (20.8)	12 (16.9)	5 (29.4)	4 (25.0)
West	44 (21.0)	17 (16.0)	20 (28.2)	1 (5.9)	6 (37.5)
Northeast	22 (10.5)	12 (11.3)	6 (8.5)	3 (17.6)	1 (6.3)
Unknown/missing	1 (0.5)	1 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)
Year of Index, n (%)					
2017*	10 (4.8)	0 (0.0)	3 (4.2)	7 (41.2)	0 (0.0)
2018	59 (28.1)	20 (18.9)	32 (45.1)	7 (41.2)	0 (0.0)
2019	55 (26.2)	42 (39.6)	12 (16.9)	1 (5.9)	0 (0.0)
2020	26 (12.4)	15 (14.2)	10 (14.1)	0 (0.0)	1 (6.3)
2021	60 (28.6)	29 (27.4)	14 (19.7)	2 (11.8)	15 (93.8)
Quan-Charlson Comorbidity Index					
Mean ± SD	0.5 ± 1.3	0.5 ± 1.0	0.6 ± 1.8	0.7 ± 1.0	0.1 ± 0.3
Median (IQR)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.0 (0.0, 0.0)
Top 5 Comorbidities, n (%)					
Gastrointestinal disorders	68 (32.4)	39 (36.8)	19 (26.8)	5 (29.4)	5 (31.3)
Hypertension	40 (19.0)	19 (17.9)	12 (16.9)	4 (23.5)	5 (31.3)
Anxiety or depression	53 (25.2)	32 (30.2)	12 (16.9)	6 (35.3)	3 (18.8)
Cardiovascular diseases	37 (17.6)	21 (19.8)	11 (15.5)	2 (11.8)	3 (18.8)
Autoimmune diseases	32 (15.2)	14 (13.2)	10 (14.1)	3 (17.6)	5 (31.3)

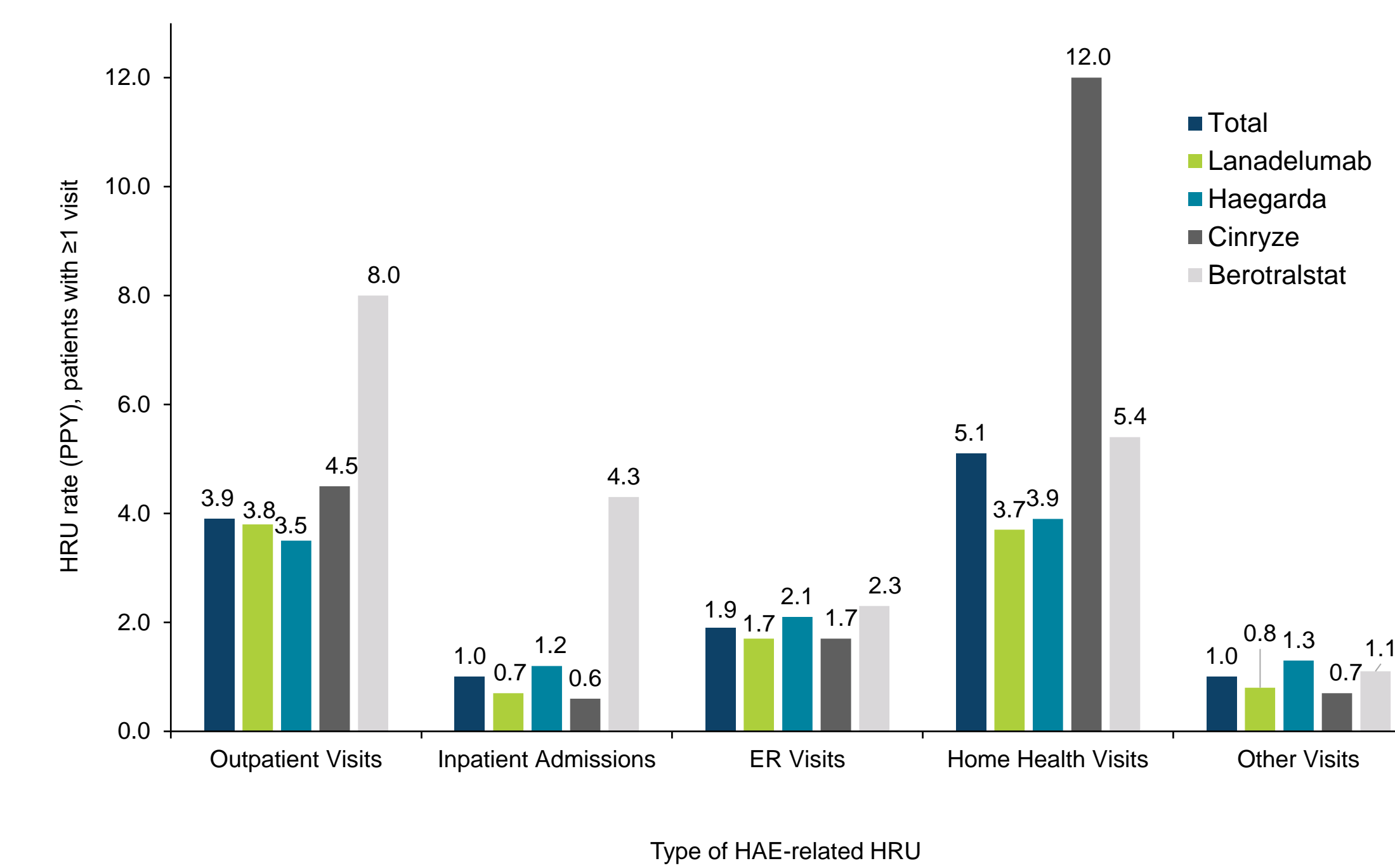
*Data availability began April 1, 2017
 Abbreviations: IQR, interquartile range; SD, standard deviation

Results

Healthcare Resource Utilization

- During a median 16-month follow-up, nearly all patients (95%) had ≥1 all-cause outpatient visit, most of which (90%) were HAE-related (unadjusted for follow-up time); Allergists were the most seen specialist (69%)
- Approximately one-third of patients had at least one HAE-related emergency room (ER) visit during follow-up (33%), and nearly one-quarter (22%) had at least one HAE-related home health visit (unadjusted for follow-up time)
- The greatest rate of HAE-related HRU was observed for home health visits (among patients with ≥1 visit: 5.1 PPY, 95% CI 4.7, 5.6) (Figure 2)

Figure 2. Rate of HAE-Related HRU



On-Demand Treatment Patterns

- During follow up, 75% of patients had claims for any on-demand treatment (Figure 3) (unadjusted for follow-up time). The most commonly-filled on-demand treatment was icatibant (61%)
- The on-demand therapy dispensation rate during follow-up was 4.4 PPY [95% CI 4.1, 4.6] (Figure 4). Icatibant was the most dispensed treatment (3.1 PPY, 95% CI 2.9, 3.3)

Figure 3. Proportion of On-Demand HAE Therapies Dispensed

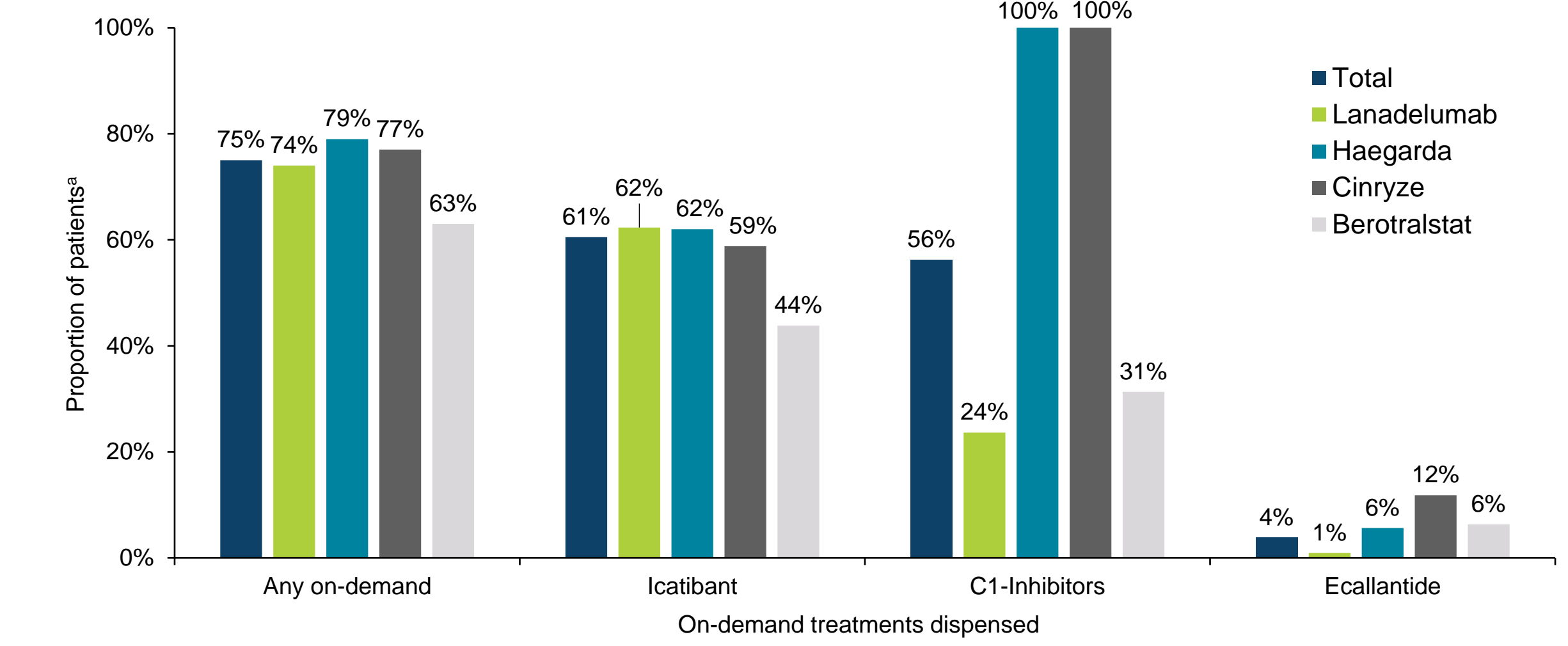
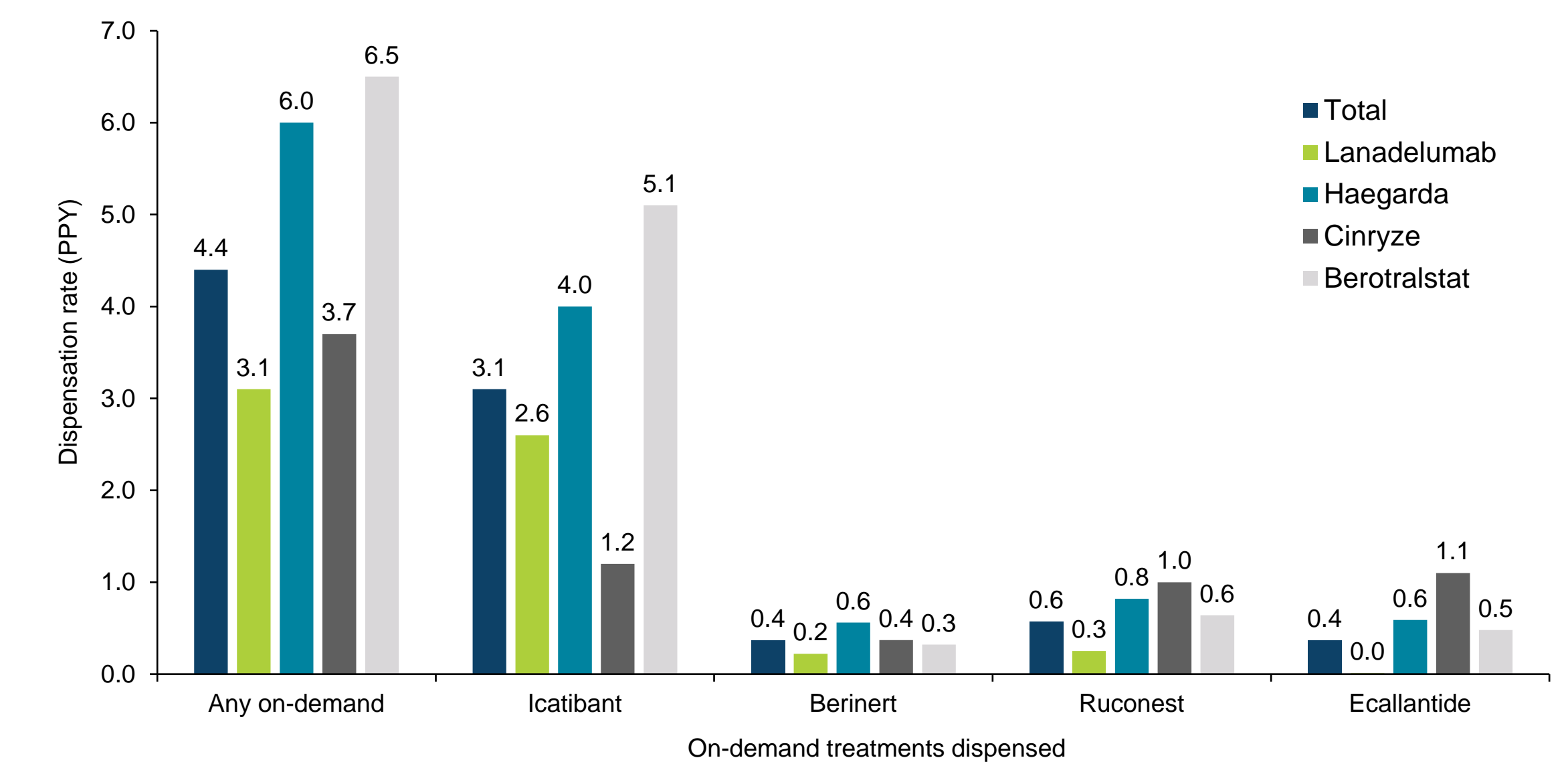


Figure 4. On-Demand HAE Therapy Dispensation Rate



Conclusions

- Non-androgen LTP users often require HAE-related home health visits (1 in 4) and seek HAE-related ER treatment (1 in 3), potentially more often than would be expected
- Among patients receiving non-androgen LTP, on-demand dispensation rate per patient year was the highest for berotralstat, followed by haegarda, cinryze and lanadelumab
- These findings underscore the importance of accessible on-demand therapy among patients prescribed non-androgen LTP

References

- Radojicic C, et al. *Allergy Asthma Proc.* 2021;42(3):S4-S10.
- Busse PJ, et al. *J Allergy Clin Immunol Pract.* 2021;9(1):132-50 e3.
- Maurer M, et al. *Allergy.* 2018;73(8):1575-96.
- Anderson J, Maina N. *Clin Transl Allergy.* 2022;12(1):e12092.
- Banerji A, et al. *Allergy Asthma Proc.* 2015;36(3):213-7.
- Tachdjian R, et al. *Allergy Asthma Proc.* 2020 May 1;41(3):172-182.

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Disclosures

This study was sponsored by KalVista Pharmaceuticals. *SC and VD are employees of KalVista Pharmaceuticals.

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