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Real-world Impact of Long-term Prophylaxis on the Clinical Burden of Patients with Hereditary Angioedema

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BACKGROUND

- Hereditary angioedema (HAE) is condition affecting approximately 1/50,000 individuals in the United States and can lead to life-threatening laryngeal edema.[1]
  - HAE "attacks" are characterized by swelling of the skin/subcutaneous tissues, the gastrointestinal tract or the upper airways.
- Patients with HAE experience significant clinical burden, including heightened healthcare resource utilization (HRU).[2]
- Long-term prophylaxis (LTP) may reduce the clinical burden of HAE by reducing attack frequency, but real-world evidence is limited.

OBJECTIVE

To describe the frequency of severe HAE attacks and HRU before and after initiation of an LTP of interest (i.e., subcutaneous C1 esterase inhibitor (C1-INH [human]), berotralstat or lanadelumab).

STUDY DESIGN

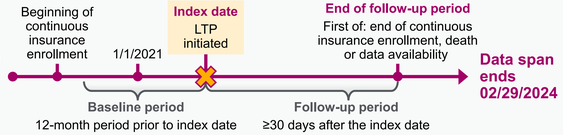
Data source

- Insurance claims from Komodo Research Data (KRD+) were used.
  - Data span: 1/1/2016 to 2/29/2024.
  - KRD+ collects closed claims data from over 150 payers, representing ≥170 million lives.

Study design and population

- A retrospective observational cohort study design was used.
- Due to the absence of an International Classification of Diseases (ICD) diagnostic code to identify HAE, patients were identified based on treatment received.
- The *index date* was the date of initiation of an LTP of interest (i.e., subcutaneous C1-INH [human], berotralstat or lanadelumab) between 1/1/2021 and 1/30/2024 (**Figure 1**).
- The *baseline period* was defined as the 12-month period prior to the index date. The *follow-up period* spanned from index date until the end of a patient's continuous insurance enrollment, death, or date of data cutoff.
- Eligible patients were aged ≥12 years old and initiated an LTP of interest (i.e., subcutaneous C1-INH [human], berotralstat or lanadelumab) between 1/1/2021 and 1/30/2024 (**Figure 2**).

FIGURE 1: Study Design Scheme



Abbreviation: LTP = long-term prophylaxis.

Outcome measures and statistical analyses

- Severe HAE attacks were proxied using hospitalizations and emergency department (ED) visits with 1) receipt of an HAE treatment, or 2) any one of: deficiency in C1-INH system, angioneurotic edema, respiratory failure, dyspnea, stridor, abdominal and pelvic pain, nausea and vomiting, intra-abdominal and pelvic swelling or localized swelling.
- All-cause HRU was reported by setting: inpatient admissions, inpatient days, ED visits and outpatient visits.
- The proportion of patients with ≥1 severe HAE attack, the number of attacks per patient and HRU were reported per-patient-per-year (PPPY) during the baseline period and during the period of LTP treatment, separately.
- Analyses were restricted to patients with >30 days of uninterrupted treatment to allow for the therapeutic effect of treatment.

RESULTS

- A total of 499 patients were included, with an average length of follow-up of 11.3 months (**Figure 2**).
- 57 patients (11%) initiated subcutaneous C1-INH (human), 257 (52%) berotralstat and 185 (37%) lanadelumab.
- 449 patients had >30 days of uninterrupted treatment, with an average length of follow-up of 12.5 months.
- Additional patient characteristics are presented in **Figure 3.**

FIGURE 2: Patient Selection Flowchart

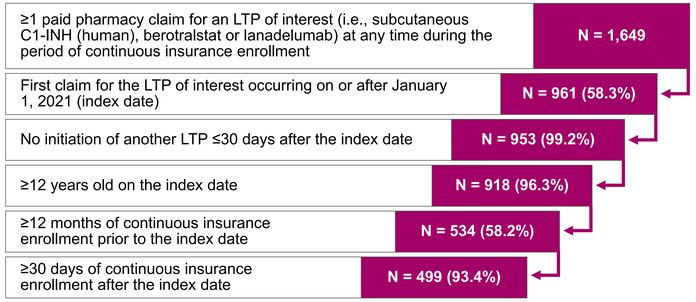


FIGURE 3: Baseline Characteristics of Patients Treated with an LTP of Interest (N = 499)

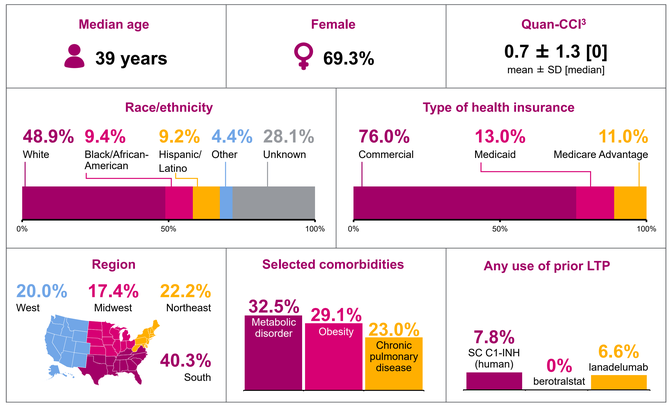
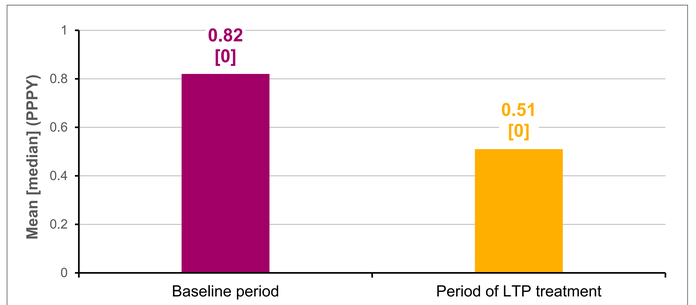


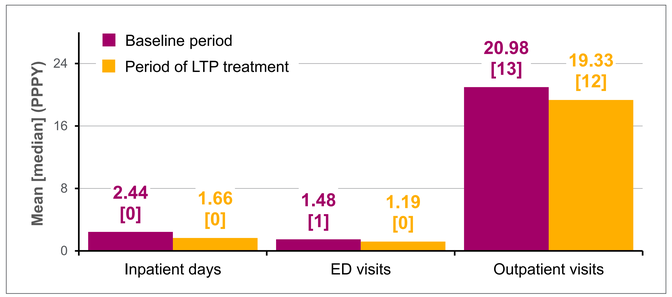
FIGURE 4: Severe HAE Attacks[1] Before and After Initiation of an LTP of Interest Among Patients with >30 Days of Uninterrupted Treatment (N=449)



Note: [1] Severe HAE attacks were proxied based on hospitalization and ED visits with HAE treatment or selected diagnosis codes.

- During the baseline period, 38% of patients had ≥1 severe attack, and the mean number of attacks PPPY was 0.82.
- During the period of LTP treatment, 23% of patients had ≥1 severe attack, and the mean number of attacks PPPY was 0.51 (**Figure 4**).

FIGURE 5: HRU Before and After Initiation of an LTP of Interest Among Patients with >30 Days of Uninterrupted Treatment (N=449)



- Annual HRU remained substantial during the baseline period and during the period of LTP treatment (**Figure 5**):
  - During the baseline period, the mean number of inpatient admissions was 0.30 PPPY, inpatient days was 2.44, ED visits was 1.48 and outpatient visits was 20.98.
  - During the period of LTP treatment, the mean number of inpatient admissions was 0.17 PPPY, inpatient days was 1.66, ED visits was 1.19 and outpatient visits was 19.33.

Abbreviations: C1-INH = C1 esterase inhibitor; CCI = Charlson Comorbidity Index; ED = emergency department; HAE = hereditary angioedema; HRU = healthcare resource utilization; LTP = long-term prophylaxis; PPPY = per-patient-per-year; SC C1-INH =subcutaneous C1 esterase inhibitor; SD = standard deviation.

CONCLUSIONS

- **This real-world study suggests that treatment with subcutaneous C1-INH (human), berotralstat or lanadelumab can partly reduce the clinical burden of patients with HAE.**
- **Real-world evidence is needed to assess whether novel therapies, including LTPs approved after the data period covered in this study, may further alleviate this burden.**

LIMITATIONS

- Since there is no ICD diagnostic code for HAE, patients were identified based on their use of HAE-related medications and presumed to have HAE.
- Severe attacks were proxied by hospitalizations/ED visits with an HAE-specific event. This could have underestimated attacks among patients who have been instructed or who chose to manage severe attacks at home.
- Patients with certain types of insurance coverage and those without insurance may not be represented in the study database.
- Two new LTP's were approved by the FDA after the end of the study period and were thus not considered in this analysis.

DISCLOSURES

Supported by Ionis Pharmaceuticals.

REFERENCES

1. *Adv Ther*. 2023;40(3):814–27
2. *Orphanet J Rare Dis*. 2024;19(1):256.
3. *Am J Epidemiol*. 2011;173(6):676-82

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