Retrospective Analysis of Patient Outcomes Associated with Subcutaneous C1INH Prophylaxis for Hereditary Angioedema

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BACKGROUND

- The humanistic burden of hereditary angioedema (HAE) is considerable and multi-faceted, affecting not only physical and emotional well-being, but exerting a broad, negative impact on quality-of-life-related factors such as education, career, work productivity, and social interactions on both patients and their families.[1–4]
- Consensus guidelines state that treatment goals are to "achieve total control of the disease, ...normalize patients' lives"[5], "lesson the burden of illness, and provide patients with HAE with a normal quality of life (QoL)."[6]
- At present, long-term prophylaxis (LTP) with medication is the only way to prevent attacks and reduce the burden of the disease.[5]
- Subcutaneous C1INH replacement therapy (C1INH[SC]; HAEGARDA®) is a first-line option for LTP.[5,6]
- C1INH(SC) is typically self-administered by the patient or a caregiver. Breakthrough attacks can be treated at home, also, using on-demand medications that are kept on hand.
- In today's treatment environment, in which patients with HAE have increasing autonomy in their disease management, an assessment of real-world outcomes of self-administered LTP therapy may be difficult to capture sufficiently through medical chart data alone.
- The purpose of this study was to gain a more holistic understanding of the clinical and QoL impacts of routine C1INH(SC) used as LTP in patients with HAE, as well as on-demand medication use patterns, using a combination of patient interviews and medical chart review data.

METHODS

Study Design and Patients

- This study was a hybrid design combining semi-structured, qualitative interviews used in parallel with a retrospective medical records review.
- Participants were adults (≥18 years) with HAE type 1 or 2 who had been using C1INH(SC) as LTP for at least 1 year and who had been using on demand treatments only for at least 1 year prior to C1INH(SC).
- Patients were identified from the practice populations of 6 clinician-investigators who were all highly experienced in the treatment of patients with HAE.

Data Collection

- Medical records were reviewed by trained site staff for the period 12 months prior and 12 months after starting C1INH(SC) LTP (index date) for data relating to HAE attacks, attack treatment, and patient impact.
- Patient interviews were conducted by telephone.
  - Each interview was 30 minutes in length and conducted by a trained interviewer from ICON plc using a semi-structured interview format with open-ended questions.
  - Patients received a $75 gift card as compensation for participation.
  - Interviews were thematically analyzed using qualitative methods (MaxQDA software) to identify themes and information relating to HAE attacks, attack treatment, and patient impact.

RESULTS

Study Cohort

- The study included 21 patients (**Table 1**) ranging in age from 24–77 years (mean age, 48.4).
- All but one patient had HAE type 1.

C1INH(SC) dosing and administration

- The majority of patients (95%; 20/21) used a C1INH(SC) dose of 60 IU/kg (1 patient used 40 IU/kg).
- Dosing frequency was biweekly (12 patients), every 3-4 days (5 patients), and not reported in 4 patients.
- Seventeen patients (81%) reported self-administration of C1INH(SC).

Table 1. Sociodemographic and Clinical Characteristics of Study Cohort

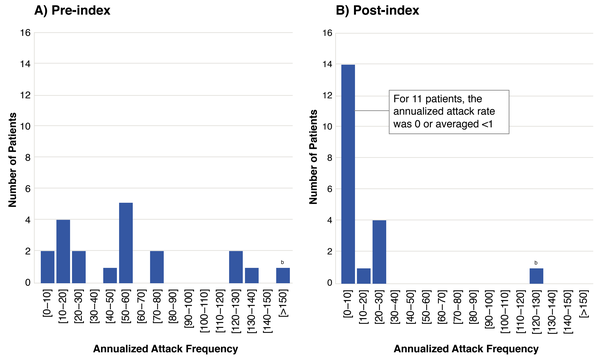
Characteristic	N=21
Age at Interview (years), mean (SD), range	48.4 (±17.0), 24-77
Sex, Female	12 (57%)
Race/Ethnicity	
White or European American	20 (95%)
Black or African American	1 (5%)
Working Status	
Working full-time	12 (57%)
Retired	5 (24%)
Looking after home/family or unemployed/seeking work	2 (10%)
Self-employed	1 (5%)
Permanently unable to work / disability	1 (5%)
Insurance Type*	
Medicare/Medicaid	6 (29%)
Private health insurance	14 (67%)
Other	5 (24%)
Patient Medical History	
Weight, last recorded (lbs), mean, range	205.2, 123-375 lbs (*n*=17)
HAE Type – Type 1	20 (95%)
HAE Type – Type 2	1 (5%)
Age at initial HAE diagnosis (years), mean, range	21.7, 4-44 years (*n*=17)
Family history of HAE	19 (90%)

Data are n (%) unless noted otherwise. N=21 unless noted otherwise. *Some patients reported multiple forms of insurance.
HAE, hereditary angioedema; SD, standard deviation

Annualized Attack Frequency

- Pre-index and post-index annualized HAE attack frequency distributions are presented in **Fig. 1**.
- Annualized attack frequencies pre-index ranged from 2-365 attacks per year.
- Post-index, 11 patients had 0 or <1 annualized attacks.
  - One patient had 130 annualized attacks post-index, but this reflected a decrease from 365 annualized attacks pre-index.

Figure 1. Histograms of patient distribution according to annualized HAE attack frequency A) pre-index and B) post-index[a]. Index = initiation of LTP with C1INH(SC)

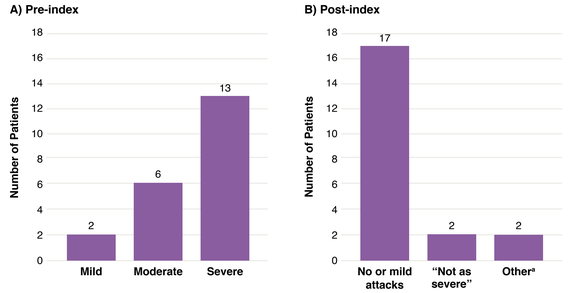


[a] By default, values reflect medical chart information; in the absence of relevant medical chart data, interview data were used (n=6 for pre-index, n=3 for post-index)
[b] Refractory patient switched backed to C1INH(SC) after a trial of lanadelumab; annualized attacks dropped from ~365 pre-index to ~130 post-index)

Attack Severity

- In all 21 interviews, patients characterized the severity of any breakthrough attacks after starting LTP with C1INH(SC) (**Fig. 2**).
  - Of the 15 patients who had any breakthrough attacks, attacks were described as mild or very mild (n=11 patients), "not as severe" (n=2), or as still being severe but resolving quicker than they did prior to using C1INH(SC) (n=1).
  - 1 patient was on C1INH(SC) throughout a pregnancy and reported increased attack frequency and severity during the pregnancy.

Figure 2. Patient characterizations of the greatest severity of HAE attacks A) pre-index and B) post-index. Index = initiation of LTP with C1INH(SC)

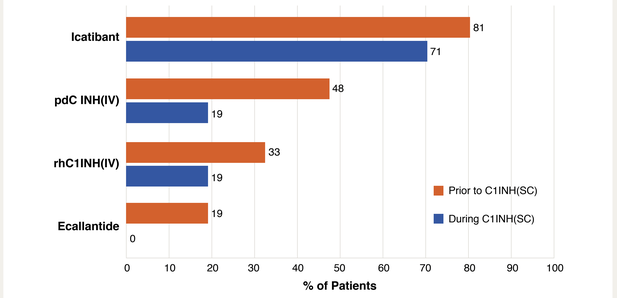


[a] 2 patients described in their interview that attack severity "varied"; pre-index severity was noted in medical charts for these 2 patients and used in this figure (1=mild; 1=moderate)

On Demand Medications

- The proportions of patients reporting use of icatibant, pdC1INH(IV), rhC1INH(IV), or ecallantide decreased as compared to pre-C1INH(SC) (**Fig. 3**).

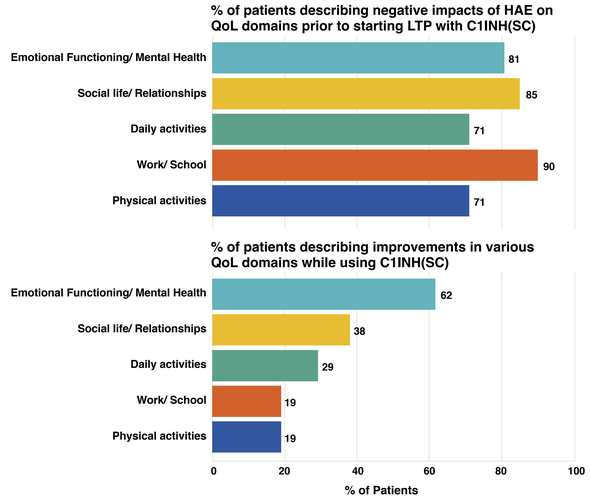
Figure 3. Patients reporting use of on-demand medications prior to and during LTP with C1INH(SC)



Quality of Life

- **Fig. 4** presents the proportions of patients who described negative impacts of HAE on various QoL domains prior to using C1INH(SC) and the proportions of patients who described improvements while using C1INH(SC).

Figure 4. Interview findings regarding QoL impacts of HAE and improvements while using C1INH(SC)



CONCLUSIONS

- This hybrid chart review/qualitative research study was uniquely designed to assess clinical and disease burden outcomes using parallel methods of medical chart data retrieval supplemented with patient interviews analyzed using qualitative methods.
- Limitations of this study include incomplete data for certain outcomes in medical charts, possible patient recall bias, and a relatively small cohort.
- Despite these limitations, the findings support that implementation of LTP with C1INH(SC) resulted in decreased HAE attack frequency, markedly lessened severity of breakthrough attacks, reduced on demand medication needs, and improvements in multiple facets of QoL.

References:
1. Bork K, Anderson JT, Caballero T, et al. *Allergy Asthma Clin Immunol.* 2021;17:40. **2.** Caballero T, Aygoren-Pursun E, Bygum A, et al. *Allergy Asthma Proc.* 2013;34:1-7. **3.** Lumry WR, Craig T, Zuraw B, et al. *J Allergy Clin Immunol Pract.* 2018;6(5):1733-1741. **4.** Lumry WR, Zuraw B, Cicardi M, et al. *Orphanet J Rare Dis.* 2021;16:86. **5.** Maurer M, Magerl M, Betschel S, et al. *Allergy.* 2022;77:1961-1990. **6.** Busse PJ, Christiansen SC, Riedl MA, et al. *J Allergy Clin Immunol Pract.* 2021;9:132-150.

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