PCR170

Patient and Societal Preferences for On-demand Treatment in Hereditary Angioedema: Estimation of Utility Using a Discrete Choice Experiment

Patrick F.K. Yong,[1] Timothy J. Craig,[2,3] Sandra Christiansen,[4] Paula Busse,[5] Tomaz Garcez,[6] Sinisa Savic,[7] Rebekah Hall,[8] Siu Hing Lo,[8] Caleb Dixon,[8] Paul K. Audhya,[9] Alice Wang,[9] Aleena Banerji,[10] Sorena Kiani-Alikhan[11]

[1]Frimley Health NHS Foundation Trust, Frimley, United Kingdom; [2]The Pennsylvania State University, Hershey, PA, United States; [3]Vinmec International Hospital, Times City, Hanoi, Vietnam; [4]University of California San Diego, La Jolla, CA, United States; [5]The Mount Sinai Hospital, New York, NY, United States; [6]Manchester University NHS Foundation Trust, Manchester, United Kingdom; [7]The Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds, Leeds, United Kingdom; [8]Acaster Lloyd, London, United Kingdom; [9]KalVista Pharmaceuticals, Framingham, MA, United States; [10]Massachusetts General Hospital, Boston, MA, United States; [11]Royal Free London NHS Foundation Trust, London, United Kingdom

Background

- Hereditary angioedema (HAE) is a rare genetic disease associated with unpredictable, recurrent attacks of tissue swelling, which can be painful, debilitating, and potentially life-threatening[1–4]
- Timely intervention with on-demand treatment at attack recognition is recommended to prevent progression and reduce severity and duration[1–3]
- Prior to sebetralstat approval in the US, UK, EU, and Switzerland,[5–8] all on-demand treatments for HAE were subcutaneously or intravenously administered
- Previous research showed that injectable on-demand therapies are associated with an administration burden that may lead to treatment delays, which are associated with poorer outcomes[9–12]
- This study estimated utility values associated with route of administration for on-demand treatments using a discrete choice experiment (DCE)

Methods

- The study population included adult patients with HAE and members of the general populations in the UK and US
- Participants were recruited between December 2024 and January 2025 by HAE International and the US HAE Association for participation in an online survey
- Four differentiating attributes of on-demand treatments plus a duration attribute were included in the DCE (**Table 1**) based on a targeted literature review of clinical trial evidence and interviews with patients (n=11)

Methods (cont)

Table 1. Attributes and levels in the DCE

Attribute	Levels
Type of on-demand treatment (administration route, treatment preparation and storage)	• Oral tablet[a,b] • Self-administered injection under the skin[b] • Self-administered infusion into the vein[b] • HCP-administered infusion into the vein[b]
How long it takes for symptoms to get at least a little better after taking the on-demand treatment	• 30 minutes • 1 hour • 2 hours • 4 hours
How long it takes until almost completely recovered from the attack after taking the on-demand treatment[c]	• 6 hours • 9 hours • 12 hours • 24 hours
Side effects of the on-demand treatment	• None • Headaches, diarrhoea, nausea, and/or indigestion • Skin reaction to the injection[a] • Painful burning or stinging sensation when medication is administered[a]
Length of life (duration)	• Another 20 years • Another 20 years and 6 months • Another 21 years • Another 23 years

[a]Injection-specific side effects (eg, redness, pain, bruising, burning, or irritation where the needle went into the skin) were never paired with oral tablet administration. [b]These levels are shortened versions that appeared in the choice scenarios. Full descriptions were provided to participants in the introduction to the DCE. [c]"Almost completely recovered" described to participants as the presence of very few symptoms, with these symptoms being not very noticeable, and little to no limitations in the ability to function because of the attack (i.e., almost "back to normal").
DCE, discrete choice experiment; HCP, healthcare professional.

- Participants completed 12 choice tasks, choosing between two unlabelled hypothetical treatments
- Estimated preference weights were used to calculate relative attribute importance
- To estimate utility values, preference weights were rescaled to a 0 (dead)−1 (full health) utility scale using two anchoring methods:
  - DCE-duration: "duration" attribute included alongside treatment-related attributes; participants asked to trade between additional life years and quality of life (ie, access to their preferred treatment)
  - DCE-visual analog scale (VAS): VAS task responses in which participants assigned a value ranging from 0 (worst imaginable health) to 100 (best imaginable health) to the "best" and "worst" health states defined by attributes

Results

Participants

Table 2. Characteristics of the patient and general population

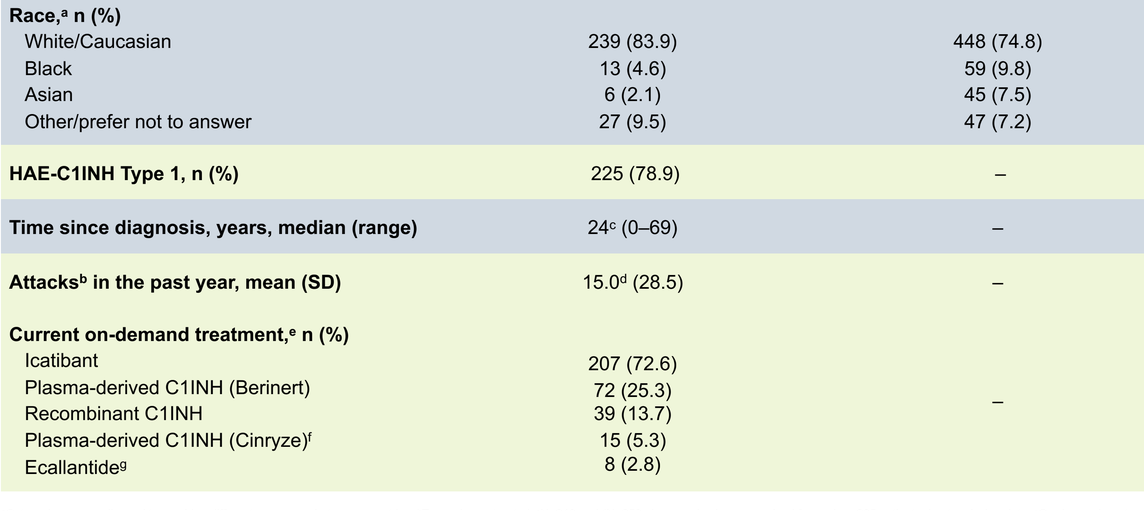
	Patient sample (N=285)	General population sample (N=599)
Location, n (%)		
UK	76 (26.7)	300 (50.1)
US	209 (73.3)	299 (49.9)
Mean age, years (range)	45.0 (18–75)	46.2 (18–87)
Female gender, n (%)	221 (77.5)	304 (50.8)
Race,[a] n (%)		
White/Caucasian	239 (83.9)	448 (74.8)
Black	13 (4.6)	59 (9.8)
Asian	6 (2.1)	45 (7.5)
Other/prefer not to answer	27 (9.5)	47 (7.2)
HAE-C1INH Type 1, n (%)	225 (78.9)	–
Time since diagnosis, years, median (range)	24[c] (0–69)	–
Attacks[b] in the past year, mean (SD)	15.0[d] (28.5)	–
Current on-demand treatment,[e] n (%)		
Icatibant	207 (72.6)	–
Plasma-derived C1INH (Berinert)	72 (25.3)	
Recombinant C1INH	39 (13.7)	
Plasma-derived C1INH (Cinryze)[f]	15 (5.3)	
Ecallantide[g]	8 (2.8)	

[a]Categories were collapsed to combine different responses between countries. [b]Treated or untreated. [c]N=240 and [d]N=259: the sample sizes comprised fewer than 285 patients due to missing data. [e]On-demand treatment use was not mutually exclusive. [f]Patients in the UK only. [g]Patients in the US only.
C1INH, C1-esterase inhibitor; HAE-C1INH, hereditary angioedema with C1-esterase inhibitor deficiency; SD, standard deviation; UK, United Kingdom; US, United States.

Discrete choice experiment

- Both populations preferred treatments with (1) shorter time to onset of symptom relief, (2) shorter time to almost complete recovery, (3) no side effects, and (4) oral over injectable formulations
- Type of treatment was ranked the most important attribute in patients and the general population; side effects were ranked the second most important attribute (**Figure 1**)

Figure 1. Relative attribute importance in the patient and general population



Error bars represent the 95% confidence interval.
[a]Under the type-of-treatment attribute, respondents considered route of administration and treatment preparation and storage.
RAI, relative attribute importance.

Utility values

- Injection route of administration was estimated to negatively impact health-related quality of life (HRQoL) relative to hypothetical treatments administered orally, as indicated by negative utility values (ie, disutility) (**Table 3**)

Table 3. Mean (dis)utility (SE) estimates for type of treatment and side effects in the patient and general population

	Patient sample (N=285)		General population sample (N=599)	
	Duration-rescaled values	VAS-rescaled values	Duration-rescaled values	VAS-rescaled values
Type of treatment[a,b]				
Self-administered injection under the skin	0.009 (0.007)	**−0.019*** (0.007)	**−0.014**** (0.005)	**−0.021***** (0.002)
Self-administered infusion into the vein	**−0.063***** (0.008)	**−0.114***** (0.011)	**−0.088***** (0.007)	**−0.058***** (0.004)
HCP-administered infusion into the vein	**−0.085***** (0.009)	**−0.157***** (0.013)	**−0.066***** (0.006)	**−0.050***** (0.003)
Side effects[c]				
Skin reaction to the injection	**−0.021***** (0.005)	**−0.011*** (0.005)	**−0.038***** (0.004)	**−0.018***** (0.002)
Painful burning or stinging sensation when medication is administered	**−0.031***** (0.005)	**−0.026***** (0.006)	**−0.047***** (0.004)	**−0.024***** (0.002)
Headaches, diarrhoea, nausea, and/or indigestion	**−0.062***** (0.007)	**−0.072***** (0.0081)	**−0.066***** (0.005)	**−0.039***** (0.003)

[a]Under the type-of-treatment attribute, respondents considered route of administration and treatment preparation and storage; [b]Reference = oral tablet; [c]Reference = no side effects.
*p<0.05; **p<0.01; ***p<0.001.
HCP, healthcare professional; SE, standard error; VAS, visual analog scale.

- Among patients with HAE, intravenous infusion was associated with the largest utility decrements relative to oral administration (−0.157 to 0.063; p<0.001), while smaller decrements were associated with subcutaneous relative to oral administration (−0.019 [p=0.012] to 0.009 [p=0.183])
  - All side effects, including injection-related reactions were associated with significant disutility values compared with no side effects
- The general public preferred an oral versus injectable administration route in all attributes evaluated
- Patient satisfaction was mixed for subcutaneous injection (dissatisfied, 50.2%; not dissatisfied, 49.8%); those who were dissatisfied had significant disutilities. Irrespective of patient satisfaction, disutilities were consistently shown with intravenous infusion

Conclusions

- **Route of administration was ranked as the most important attribute when considering on-demand treatment for HAE attacks, with an overall preference for an oral versus injectable administration route**
- **Injectable administration and related side effects had significant negative impacts on HRQoL beyond those imposed by HAE**
- **An oral on-demand treatment would have the potential to alleviate the administration burden and improve patients' quality of life**

References

1. Maurer M, et al. *Allergy*. 2022;77(7):1961–1990.
2. Betschel S, et al. *Allergy Asthma Clin Immunol*. 2019;15:72.
3. Busse PJ, et al. *J Allergy Clin Immunol Pract*. 2021;9(1):132–150.e3.
4. Bernstein JA. *Am J Manag Care*. 2018;24(14 Suppl):S292–S298.
5. Sebetralstat (EKTERLY). US prescribing information. KalVista Pharmaceuticals, Inc; 2025.
6. Sebetralstat (EKTERLY). UK summary of product characteristics. KalVista Pharmaceuticals, Ltd; 2025.
7. Sebetralstat (EKTERLY). EU summary of product characteristics. KalVista Pharmaceuticals (Ireland) Ltd; 2025.
8. Sebetralstat (EKTERLY). Switzerland fachinformation. KalVista Pharmaceuticals Switzerland GmbH. 2025.
9. Betschel SD, et al. *Allergy Asthma Clin Immunol*. 2024;20(1):43.
10. Christiansen SC, et al. *Allergy Asthma Proc*. 2015;36(2):145–150.
11. Cancian M, et al. *Allergy*. 2025. Jul 16. Epub ahead of print.
12. O'Connor M, et al. *World Allergy Organ J*. 2025;18(8):101083.

Please scan this QR code to view this poster after the presentation.

KalVista Pharmaceuticals

Presented at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Europe 2025 Congress; 9–12 November; Glasgow, Scotland.