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Discrete choice experiment (DCE) methodology associated with a multi-phase patient/caregiver preference study in growth hormone deficiency (GHD)

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Aim

- Global aim of the study: To develop a preference survey to assess patient and caregiver device preferences for long-acting growth hormone analog (LA-GHA) treatments for growth hormone deficiency (GHD).

Introduction

- Therapeutic options for GHD are available and have recently expanded, providing patients and caregivers with new treatment options.
- While once daily (Q1D) short-acting growth hormones (SA-GHs) have represented the standard of care[1], a number of once weekly (Q1W) LA-GHA treatments have emerged (FDA-approved for adult and/or pediatric GHD between 2020-2023)[2-4].
- At present, three Q1W LA-GHA injection treatments are available in the United States (US); each regimen differing with respect to device administration, dose preparation, storage/handling, and safety[2-4].
- The value of capturing and meaningfully incorporating the patient and caregiver voice into medical product decision-making continues to emerge as important for regulators, providers, and patients.
- Previous preference studies (e.g., discrete choice experiments [DCEs]) have quantified preference for GHD treatments/devices[5,6]. However, to date, no published studies have explicitly explored preferences for attributes relating to Q1W LA-GHA devices, independent of injection frequency.
- A DCE is planned to quantify patient and caregiver preferences regarding attributes that differentiate among currently approved LA-GHA devices in the US[7,8].
- This poster details the planned DCE methodology as part of a broader multi-phase preference study.

Methodology

- A DCE is a stated preference methodology that elicits and measures trade-offs made by individuals when evaluating different treatment options.
- In a DCE, task participants select their preferred option among a variety of alternatives, with each alternative differentiating with respect to the levels (options) shown for each attribute. An example of a two-alternative forced choice task is shown in **Figure 1.**

Figure 1: An example two-alternative forced choice task

	Treatment A	Treatment B
Attribute	Level	Level
Attribute	Level	Level
Attribute	Level	Level
Attribute	Level	Level
Attribute	Level	Level
	○	✓

Methodology continued

- DCE methodology was employed as part of this three-phase observational (non-interventional) study. The overall study outline is summarized in **Figure 2**. Phases 1 and 2 of this research have been completed.
- Each study phase is described in more detail below:

Figure 2: DCE development and study phases

Phase 1:
Targeted literature review (TLR)
Aim: Identification of relevant key attributes and levels

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Phase 2:
In-depth concept elicitation (CE) interviews and cognitive debriefing (CD)
Aim: To explore patient/caregiver preference of Q1W LA-GHA devices and test/validate the draft A&L grid

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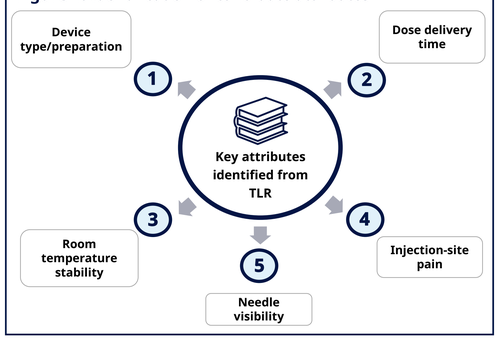
Phase 3:
DCE quantitative survey (including cognitive pilot interviews)
Aim: To quantify patient/caregiver preference for Q1W LA-GHA devices using DCE methodology

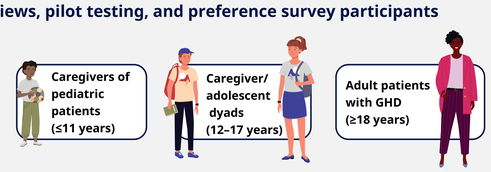
- **Phase 1:** A targeted literature review was conducted to identify key attributes and levels relevant to patients with GHD and caregivers. This informed the development of a draft attributes and levels (A&L) grid in accordance with best practice methodological guidelines[9,10].
- **Phase 2**: Conduct of 20 in-depth qualitative CE and CD interviews involving patients with GHD and/or their caregivers (**Figure 3**) to explore patient experiences and preferences of GHD treatments and to test and validate the draft A&L grid.
  - Telephone interviews used broad, open-ended questioning to obtain feedback on the draft A&L grid which was shared on a screen-sharing platform.
  - Findings from the targeted literature review and qualitative interviews were later considered alongside input from expert endocrinologists and relevance to the specific research question, to inform the content of the quantitative preference survey.
- The candidate attributes identified via the TLR (phase 1), which were firstly subject to in-depth qualitative pretesting (phase 2), are summarized in **Figure 4.**
- These attributes will be subjected to further pilot testing prior to grid finalization and eventual DCE survey roll-out.

Figure 4: Identification of candidate attributes



- **Phase 3:** The quantitative preference survey aims to recruit approximately N=100 participants, including patients and/or caregivers (**Figure 3**).

Figure 3: Qualitative (CE/CD) interviews, pilot testing, and preference survey participants



Phase 2 interviews:	6	8	6
Phase 3 pilots:	4	4	4
Phase 3 DCE:	25	25	50

Proposed data analysis for quantitative preference survey:

- Hierarchical Bayesian (HB) estimation will be used on the choice data to estimate the relative value each participant puts on an attribute level (called 'preference weights' or 'part-worth utilities').
- For the overall sample, HB will estimate a unique utility function for each participant.

- ***Relative attribute importance (RAI):*** The RAI will be calculated to determine how important each attribute was in decision-making.
- ***Preference share:*** The share of choice (preference share) will be estimated for a number of pre-defined scenarios and profiles. This provides an estimated probability that a participant will prefer one profile among others in a given scenario.
- Attribute levels will initially be modelled as categorical variables. For attributes with numeric levels, linear interpolation will be conducted via a piecewise linear curve function when numeric levels are between the ranges defined by the levels included in the DCE.

Proposed experimental design:

- When conducting the DCE, it is not feasible for each participant to receive and respond to every possible combination of attributes and levels.
- This DCE will involve constructing a design that ensures orthogonality (that each level appears an equal number of times with every other level of different attributes) and level balance (that each level appears an equal number of times per attribute) where possible.

Population-specific considerations for the task completion setting:

- Few DCEs have explored approaches to elicit preferences from adolescents separate from an accompanying caregiver, given appreciable concerns around feasibility of completion[11].
- In efforts to ensure preferences in this study are elicited in close alignment with the real-world decision context, adolescents in this study will provide responses to the choice tasks while accompanied with their caregiver (as part of a combined adolescent/caregiver dyad).
- Collecting shared decisions among adolescent/caregiver dyads is the preferred approach to DCE survey completion and considered to be reflective of the specific decision context.

Moderator-assisted completion:

- Moderator-assisted surveys will be administered for the adolescent/caregiver dyads, to ensure further examination can contextualize the dynamics of the decision-making environment and aid interpretation of the quantitative outputs.
- Forty-five minutes will be allocated for n=25 adolescent (aged 12-17 years)]/caregiver dyads to complete the survey through moderator-assisted interviews.

- Assisted surveys will be conducted using a screen-sharing platform to share the survey instrument with participants, with the moderator being present to record observations on dynamics and any rationale provided to answers as respondents verbalize their thoughts.[11]

Discussion

- The results from the DCE study are expected later in 2024.
- **Key strengths:** This study will incorporate multiple rounds of feedback from the target patient and caregiver population per best practice guidance, alongside input from KOLs, to ensure the study is fit-for-purpose.
- **Key limitations:** The limitations applicable to preference methodologies generally are noted:
  - The number of attributes for inclusion in a DCE is finite; it is not possible to account for all attributes that may influence treatment decisions. However, all attempts will be made to ensure that the treatment options presented are realistic and meaningful to GHD patients and caregivers.
  - The choices made by patients or caregivers in any hypothetical preference study may not have the same implications of actual treatment decisions in the real-world, which may limit the generalizability of the findings.

Conclusion

- The results of this study will provide real-world insights into patient and caregiver preferences and the trade-offs made when choosing between different LA-GHA device options available.
- Results will facilitate shared therapeutic decision-making between patients and caregivers, and the treating clinician.
- Findings may be relevant to a number of healthcare stakeholders (including regulators, Health Technology Assessment [HTA] bodies, and payers).

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