Patient Preferences for Attributes of Type 2 Diabetes Mellitus Treatments in Spain

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BACKGROUND

Introduction

- Treatment options for type 2 diabetes mellitus (T2DM) vary in efficacy, adverse event profile, and mode of administration.
- Albiglutide is a once-weekly glucagon-like peptide-1 receptor agonist (GLP-1 RA).[1-3] The profile of albiglutide differs from other GLP-1 RAs and other T2DM therapies in ways that may be important to patients and could affect patients' perceptions of and satisfaction with treatment.[4]
- It is important to understand the value that patients with T2DM place on the attributes of T2DM medicines in order to understand how each of these attributes might differentially affect patients' choices.

OBJECTIVE

- To quantify patient preferences for features of T2DM treatments in Spain, using a discrete-choice experiment (DCE) survey.

METHODS

Survey Development

- The survey comprised the following components:
  - Questions about demographic characteristics, disease experience (time since diagnosis, current and target glycosylated haemoglobin [HbA1c]), experience with T2DM treatments, and adverse events from T2DM treatments
  - DCE questions
    - Respondents chose between two hypothetical treatments for T2DM, with treatment attribute levels that varied for each question; treatment attribute levels for the DCE were informed by efficacy and safety data from clinical trials **(Table 1)**
- The survey instrument was pretested with 15 patients with diabetes in Spain and approved by RTI International's institutional review board.

Table 1. Attribute Levels for DCE

Attribute	Levels
Chance that medicine works well to control blood sugar (HbA1c)	100 out of 1,000 people (10%) reach target HbA1c
	300 out of 1,000 people (30%) reach target HbA1c
	500 out of 1,000 people (50%) reach target HbA1c
Reduction in risk of serious heart attack or stroke	35 out of 1,000 patients experience serious heart attack or stroke (5% reduction in risk)
	37 out of 1,000 patients experience serious heart attack or stroke (no risk reduction)
Hypoglycemic events (hypos)	No hypos
	1-2 hypos per year
	1-2 hypos per month (12-24 hypos per year)
	More than 2 hypos per month (more than 24 hypos per year)
Risk of gastrointestinal (GI) problems	0% (no risk of GI problems)
	100 out of 1,000 people (10%) have GI problems
	200 out of 1,000 people (20%) have GI problems
	300 out of 1,000 people (30%) have GI problems
Weight change	2-kg weight loss
	No weight change
	2-kg weight gain
Mode of administration	Pill
	Injection
Dosing frequency	Once a week
	Once a day
	Twice a day
	More than twice a day

Note: "Chance that medicine works well to control blood sugar (HbA1c)" was modeled as a continuous variable, so only one variable was included in the model. The remaining attributes were modeled as effects-coded categorical variables.

Data Sources

- Web panelists in Spain were eligible to participate in the study if they were aged 18 years or older, had a self-reported physician diagnosis of T2DM, and had taken at least two different T2DM treatments.

Data Analysis

- Analyses for descriptive statistics were conducted using SAS Version 9.3 (SAS Institute Inc); remaining analyses were conducted using NLOGIT 5 (Econometric Software, Inc).

Full Sample DCE Analysis

- T2DM treatment choice model was estimated using random-parameters logit (RPL), and treatment attributes were included in the model as effects-coded categorical variables, except efficacy, which was modeled as a linear continuous variable.
- RPL parameter estimates can be interpreted as relative preference weights, where larger positive coefficients thus equate to higher preference weights, indicating that respondents preferred that attribute level to levels with smaller or negative coefficients.

Subgroup DCE Analysis

- To help explain preference heterogeneity across subgroups, separate RPL models were estimated for the following mutually exclusive subgroups and then tested for differences in preferences: male vs. female; < 65 years old vs. ≥ 65 years old; self-reported T2DM diagnosis < 7 years ago vs. ≥ 7 years ago; injectable medicine users (at the time of the survey) vs. not.

Preference Shares

- Treatment profiles were created to approximate a range of injectable treatments available in Spain **(Table 2)**. RPL results were then used to predict the proportion of respondents who would prefer each therapy.

Table 2. Injectable Treatment Profiles for Preference Shares

Attribute	Daily GLP-1	Basal Insulin	Prandial Insulin	Albiglutide
Chance that medicine works well to control blood sugar (HbA1c)	50%	50%	45%	40%
Reduction in risk of serious heart attack or stroke	0%	5%	0%	0%
Hypoglycemic events (hypos)	1-2 per year	1-2 per month	More than 2 per month	1-2 per year
Risk of GI problems	30%	10%	10%	10%
Weight change	2-kg loss	2-kg gain	2-kg gain	No change
Dosing frequency	Once a day	Once a day	More than twice a day	Once a week

Note: All drug profiles were mapped directly from the choice question attributes with the exception of HbA1c in prandial insulin and albiglutide, which was extrapolated from the levels included in the survey.

RESULTS

Study Population

- Of those invited who responded, 446 (28.2%) were eligible to participate. Of those who were eligible and consented to participate, 401 (93.3%) completed the survey.

Table 3. Demographic and Background Characteristics (N = 401)

Characteristic		n (%)
Gender	Male	267 (66.6%)
Age	Mean (SD)	50.8 (13.5)
Self-reported duration of diabetes	≤ 3 years	103 (25.7%)
	> 3 years-< 7 years	165 (41.1%)
	≥ 7 years	131 (32.7%)
	Don't know	2 (0.5%)
Diabetes medications currently being used	Only tablets	226 (56.4%)
	Only injectables	65 (16.2%)
	Both tablets and injectables	110 (27.4%)

SD = standard deviation.

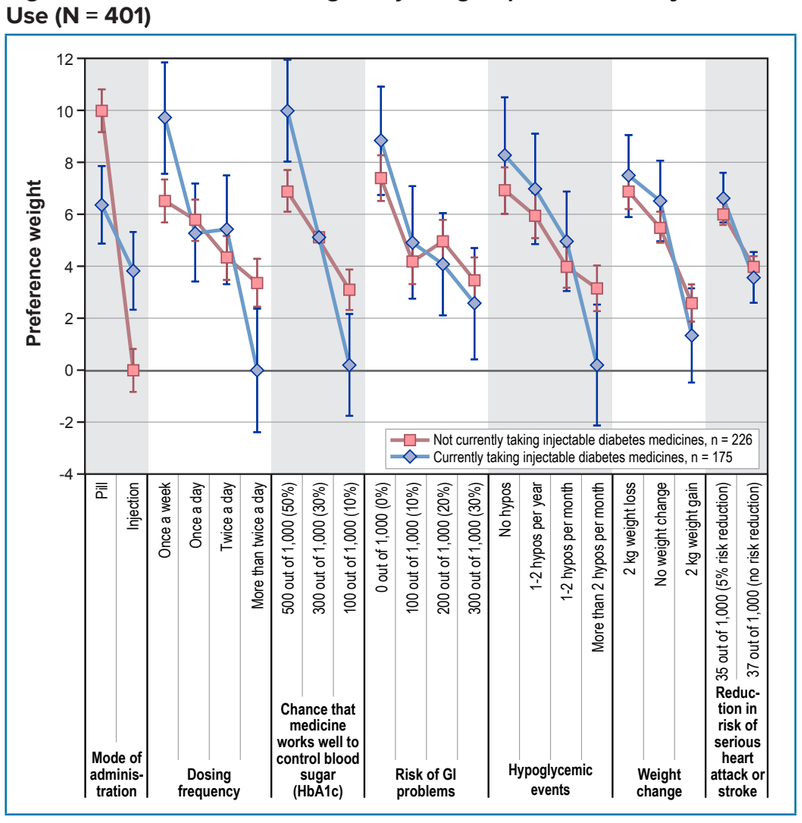
DCE Model

- **Figure 1** shows the normalized preference weights for patients who were not using injectable medicines at the time of the study compared with patients who were.
- These two groups had statistically significantly different preferences ($P < 0.01$).
- Respondents using injectables at the time of the study:
  - Placed the most weight on changes in efficacy, dosing frequency, and avoiding hypos and GI problems over the range of levels included in the survey
  - Significantly preferred "once a week" to "once a day" dosing ($P < 0.01$)
  - Were indifferent between pills and injections ($P = 0.10$)
- Respondents not using injectables at the time of the study:
  - Placed the most weight on moving from injection to pills and similar weight on changes in the other attributes
- No significant differences in overall preferences were found between subgroups defined in terms of gender, age, or T2DM duration.

Preference Shares

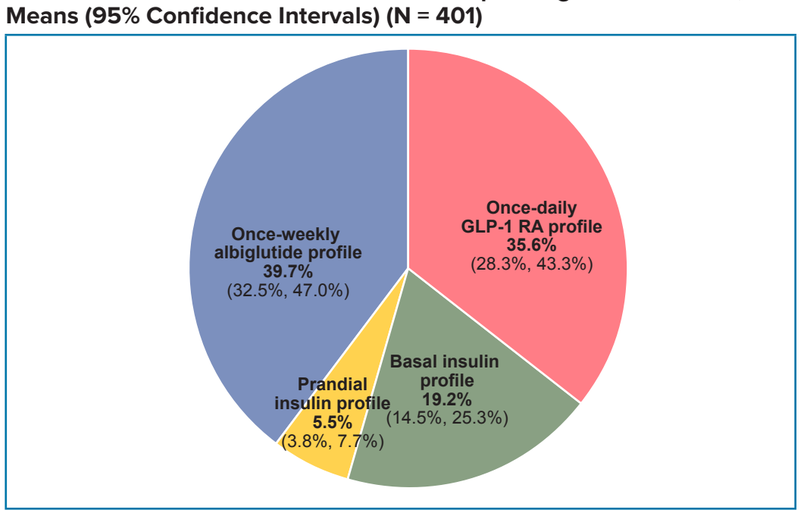
- The albiglutide-like profile was predicted to have the greatest preference share, followed by a once-daily GLP-1 RA-like profile amongst injectable-only comparator choices **(Figure 2)**.

Figure 1. DCE Preference Weights by Subgroup on Current Injection Use (N = 401)



Note: The vertical bars surrounding each mean preference weight denote the 95% confidence interval about the point estimate.

Figure 2. Predicted Preference Shares for Injectable Treatments Based on DCE Results for Attributes Levels Corresponding to Each Profile, Means (95% Confidence Intervals) (N = 401)



CONCLUSIONS

- These results suggest that patients from Spain with T2DM value efficacy but are willing to accept lower treatment efficacy in exchange for improved dosing and side effects. In particular, patients taking injectables would trade treatment efficacy for less frequent dosing, while patients not taking injectables would trade treatment efficacy for a preferred mode of administration (pills vs. injection).
- Study limitations include: patient self-reported data were used for T2DM diagnosis and treatment, sample may not be representative of the broader Spanish T2DM population, and DCE data were based on hypothetical treatments profiles, limiting the attributes that patients can compare.
- Given the variety of T2DM medications available, the results suggest that careful discussion about patient preferences could help patients and physicians identify T2DM treatments of greater value to patients.

REFERENCES

Please see handout for complete reference list.

DISCLOSURES

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MS, AM, LM, and RL are employees and shareholders of GlaxoSmithKline. CM and CP are employees of RTI. AP was an employee of RTI when research conducted.

Ms. Pugh was an employee of RTI Health Solutions when this research was conducted; she is currently a medical student at the University of California San Francisco.