

Effect of Using the mySugr App on the Glycemic Control: A Real-World Analysis from Mexico

ABSTRACT

Objectives: to describe Mexican population with T1DM and to find out if blood glucose (BG) testing frequency has any impact on main glycemic targets (mean BG and estimated hemoglobin A1c [eHbA1c]).

Patients and methods: users of mySugr from Mexico who had a self-reported diagnosis of T1DM and reported at least 2 BG-logs in at least 14 days (G2D14) in the month prior to their first log entry were included. G2D14 is defined as the lowest adherence rate to be sufficient to calculate eHbA1c. Participants were stratified as low testing (G2D14 + G3D14) and high testing (G4D14 + G5D14). Subgroup analysis according to baseline eHbA1c were performed. An exploratory analysis to identify factors associated with BG decrease was also considered using a logistic regression model.

Results: data from 118,210 users with connected BG monitoring (13% with T1DM) was considered for the analysis. Users in the highest testing subgroup (G5D14; n=276) in the first month before mySugr usage had a significantly lower baseline eHbA1c (-0.8 %; p < 0.01) when compared with participants in the lowest category (G2D14; n=254). For all users with T1DM in the testing class G2D14 or above, eHbA1c decreased from baseline (one month prior to mySugr usage) and stayed below baseline levels for the entire observation period of 5 months (n=253; mean differences: -0.3% at the first month of mySugr usage, -0.2% at the fourth month of mySugr usage; both changes significantly different from 0 with p < 0.05). No statistically significant difference in eHbA1c between the high and low logging subgroups after 4 months of mySugr use was found.

Nevertheless, high logging participants with baseline eHbA1c > 8% experienced a nonsignificant higher reduction. In the logistic regression model, the factor with the strongest association with BG decrease was the baseline mean BG value (log odds ratio: 2.4).

Conclusion: in our real-world setting in Mexico, the use of mySugr was associated with reduced eHbA1c in people with T1DM. Baseline BG level was statistically associated with BG reduction intensity. Although we did not find a significant difference in eHbA1c improvement between the high and low logging subgroup during mySugr usage, our baseline analysis suggests that users with increased logging behavior have significantly better glycemic control before starting with mySugr.

BACKGROUND

- In Mexico, type 2 diabetes mellitus is highly prevalent, and its incidence is rising.¹ Nevertheless, type 1 diabetes mellitus (T1DM) is frequently overlooked and considered a low prevalence disease.¹
- It has been reported that persons living with type 1 diabetes mellitus (PWT1DM) usually receive suboptimal treatment for long periods, increasing the probability of chronic complications.¹
- The beneficial effects of self-monitoring of blood glucose (SMBG) on glycemic control in patients treated with insulin include the optimization of treatment outcomes and the promotion of the active participation of PWT1DM in the control and management of the disease.² However, data on the impact of blood glucose (BG) frequency testing is scarce.
- The mySugr App is a tool aimed to guide management of PWT1DM. The objectives of our study were (1) to describe Mexican population with T1DM and (2) to find out if BG testing frequency has any impact on main glycemic targets (mean BG and estimated hemoglobin A1c [eHbA1c]).

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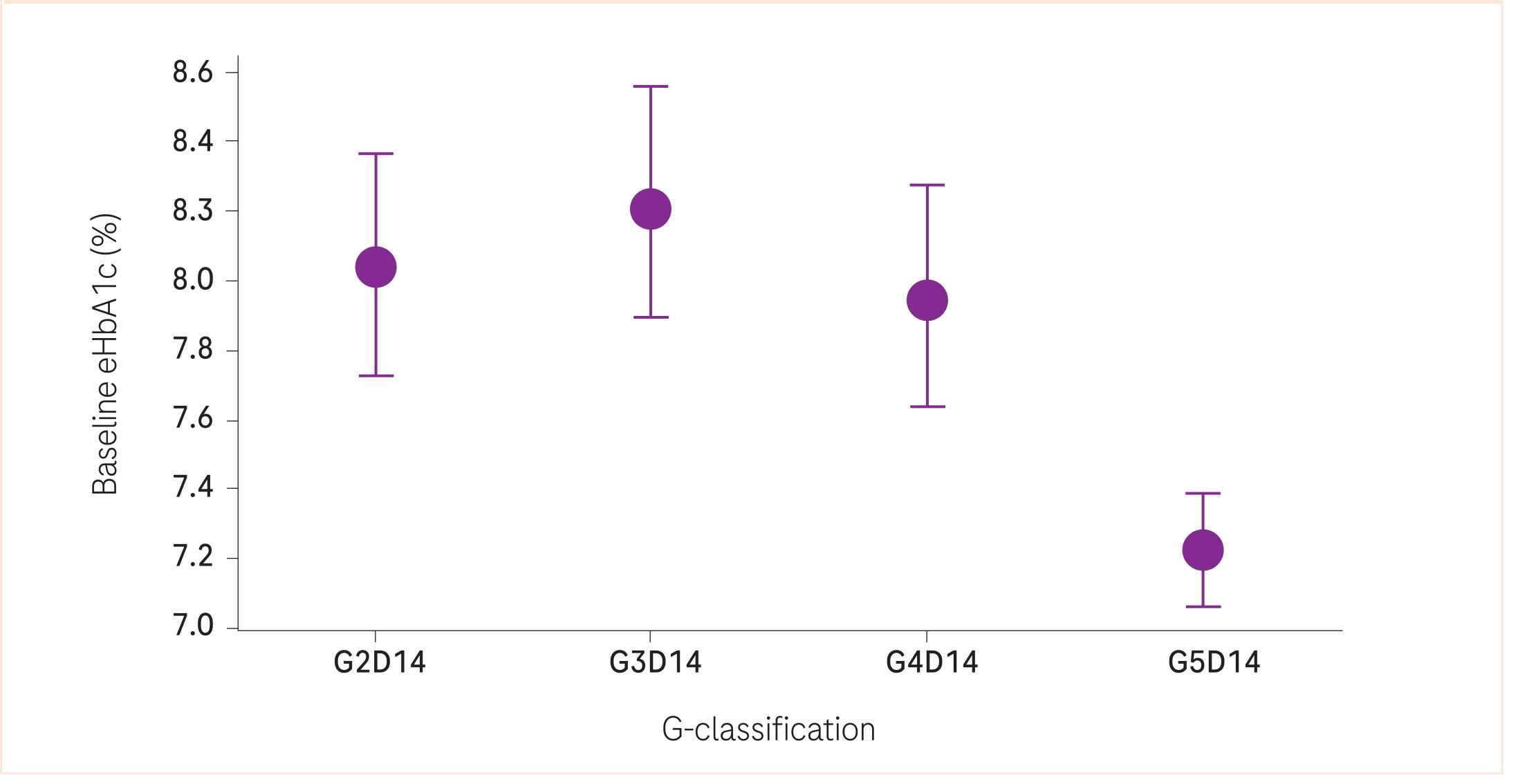
METHODS

- Users of mySugr App from Mexico who had a self-reported diagnosis of T1DM and reported at least 2 BG-logs on at least 14 days (G2D14) in the month prior to their first log entry were included.
- G2D14 is defined as the lowest adherence rate to be sufficient to calculate eHbA1c.
- Participants were stratified as low testing (G2D14 + G3D14) and high testing (G4D14 + G5D14) cohorts.
- Subgroup analysis according to baseline eHbA1c were performed (eHbA1c < 7%; 7% ≤ eHbA1c < 9%; eHbA1c ≥ 9%).
- An exploratory analysis to identify factors associated with BG decrease was also considered using a logistic regression model.

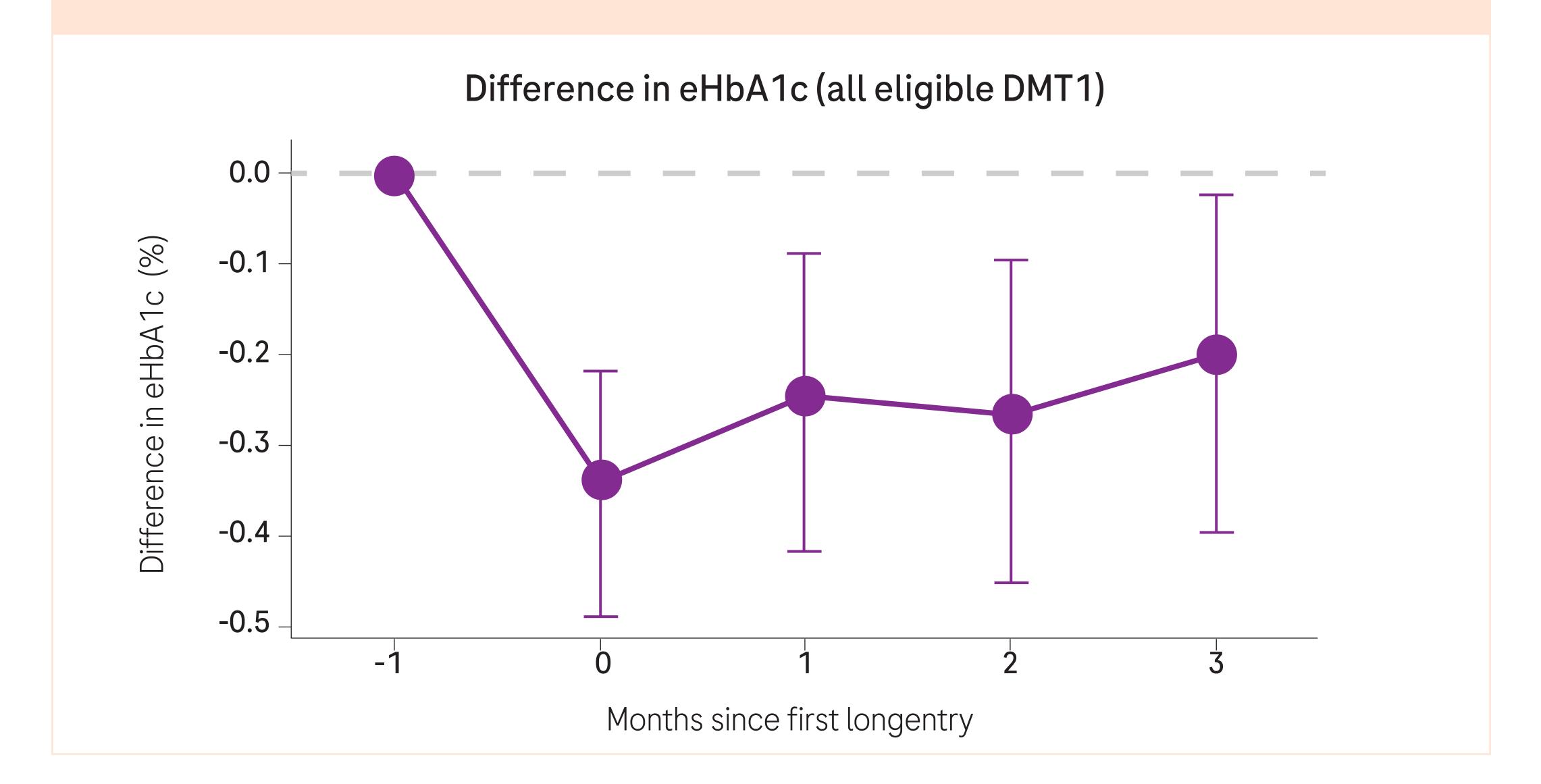
RESULTS

- Data from 118,210 Mexican users with connected BG monitoring (13% with self-reported T1DM) was considered for the analysis.
- Users in the highest testing subgroup (G5D14) in the first month before mySugr App usage had a significantly lower baseline mean BG when compared with participants in the other logging categories (-0.8 %; p < 0.01).
- For all users with T1DM, eHbA1c significantly decreased from month -1 and stayed below baseline levels for the entire observation period (mean differences: -0.3% at month 0, -0.2% at month 3; p = 0.035; Figure 1).

Figure 1: Baseline eHbA1c of PWT1DM in Mexico in the month prior to their first mySugr App use. Error bars show 95% confidence intervals. For this analysis, PWT1DM from Mexico that fell within at least logging class G2D14 (at least 2 BG-logs in at least 14 days) in the month prior to their first mySugr log entry were looked at. Logging class was significantly associated with baseline eHbA1c (One-way ANOVA; F=11.5; p < 10⁻⁶) and a post hoc test revealed that only the G5D14 logging class was significantly different from the other classes (Tukey's HSD; p < 10⁻³).

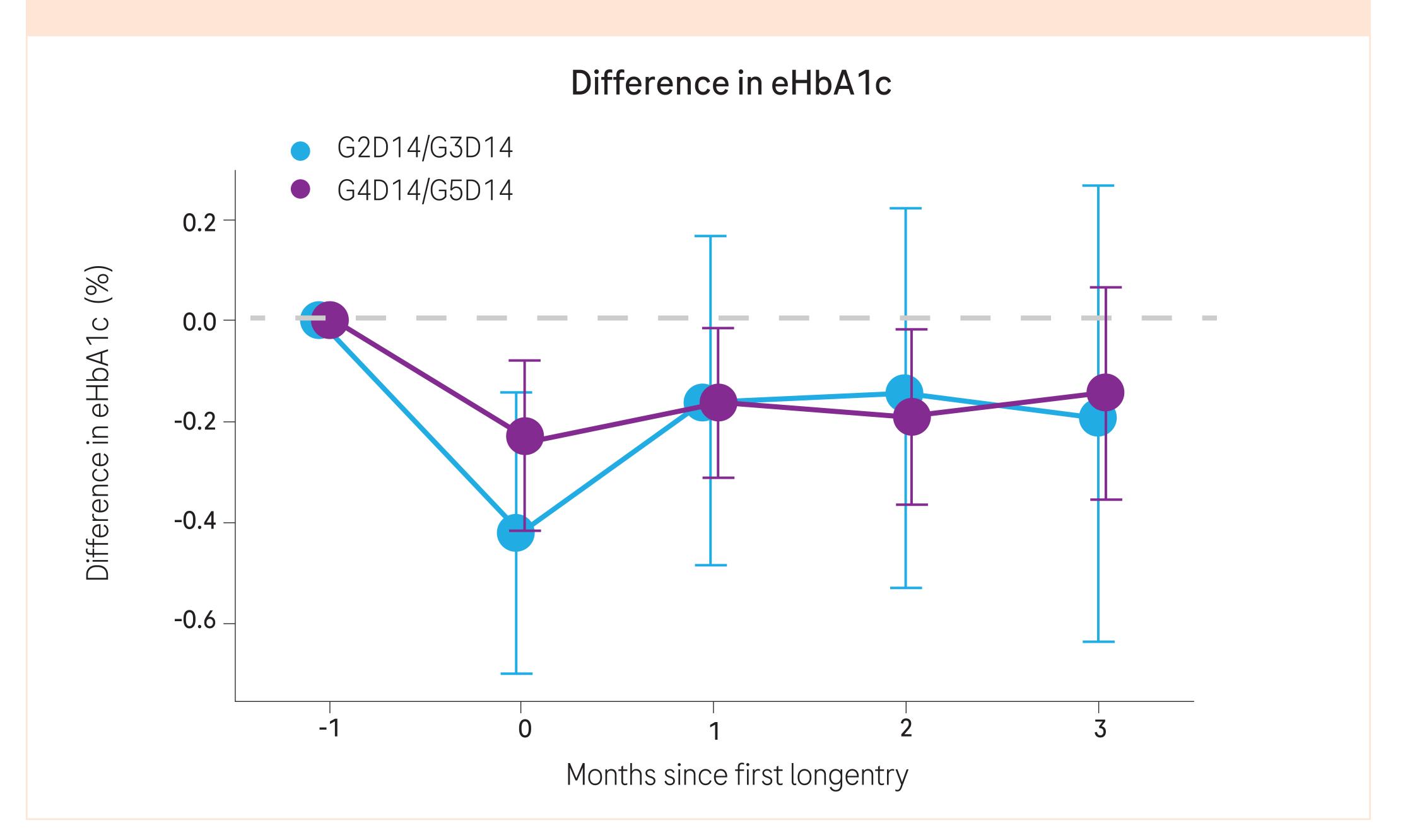


• Users in the highest testing subgroup (G5D14; n=276) in the first month before mySugr App usage had a significantly lower baseline eHbA1c (-0.8 %; p < 0.01) when compared with participants in the lowest category (G2D14; n=254). **Figure 2:** Differences in eHBA1c (%) according to time since first log entry. Dots represent mean BG of all eligible connected PWT1DM in Mexico (n = 253 with $\geq G2D14$). Error bars show 95% confidence intervals. The mean difference in eHbA1c at month three compared to baseline was -0.2% (p<0.05)



 Differences in eHBA1c (%) according to time since first log entry. Dots represent mean BG of all eligible connected PWT1DM in Mexico (n = 253 with ≥ G2D14). Error bars show 95% confidence intervals. The mean difference in eHbA1c at month three compared to baseline was -0.2% (p<0.05).

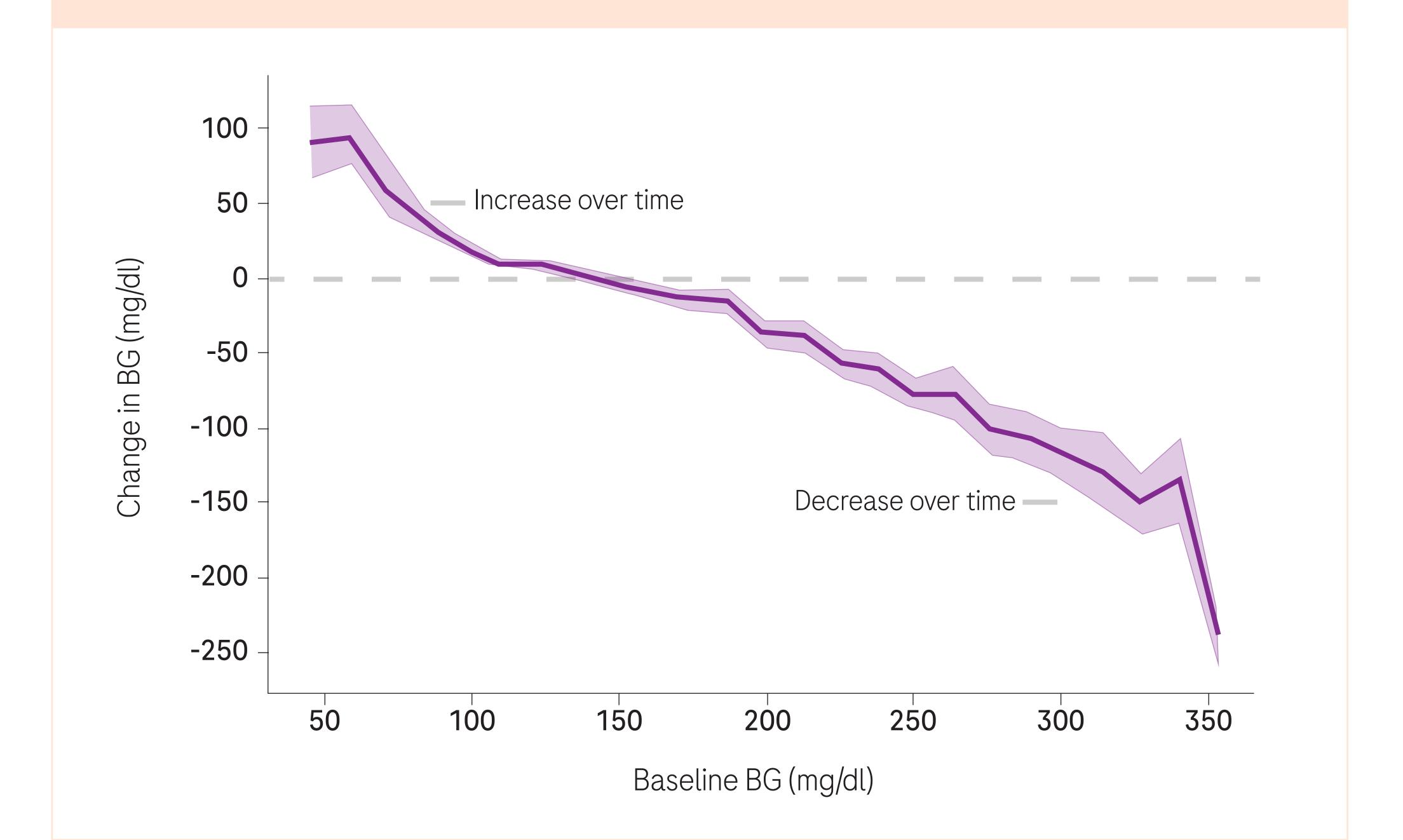
Figure 3: Comparison of high (G4D14/G5D14) and low (G2D14/G3D14) logging cohorts in terms of differences in eHBA1c (%). Dots represent mean BG of all eligible connected PWT1DM in Mexico. Error bars show 95% confidence intervals (CI). No statistical differences are suggested by overlapping CIs.



 No statistically significant difference in eHbA1c between the high (G4D14 + G5D14) and low (G2D14 + G3D14) logging cohorts after 4 months of using mySugr App use was found, as suggested by overlapping 95% confidence intervals. Nevertheless, the analysis showed that both user types improved their eHbA1c.



Figure 4: Model based analysis to estimate factors associated with BG decreases. Baseline BG, total amount BG-logs, gender, therapy type and age were included in the model. Strongest association was to baseline BG value (log-odds ratio: 2.4).



• A logistic regression model was performed for all users to assess additional effects of high logging frequency among PWT1DM with suboptimal basal BG control. All these users had available values at month -1 and month 3. The factor with the strongest association with BG reduction was the baseline mean BG value (log odds ratio: 2.4).

CONCLUSIONS

- In this real-world setting in Mexico, the use of mySugr App was associated with reduced eHbA1c in PWT1DM.
- Baseline BG was statistically associated with BG reduction intensity.
- No significant difference in eHbA1c improvement between the high and low logging cohorts were reported; nevertheless, baseline analysis suggests that users with increased logging behavior have significantly better glycemic control before starting with mySugr App.

REFERENCES

1. Faradji-Hazán RN, *et al*. Rev. Invest. Clín. 2021; 73(4): 222-230.

2. Elgart JF, *et al*. Acta Diabetol. 2016; 53(1):57-62.