

Long-term Glycemic Control in Adult Participants Using Control-IQ Technology: Real-World Evidence

Rishi Graham,¹ Harsimran Singh,² Gabriel Alencar,² Lars Mueller,² Michelle Manning,² Kirstin White,² Alex Wheatcroft,² KC Carmelo,² Eliah Aronoff-Spencer,¹ Steph Habib,² Jordan Pinsker²

¹University of California San Diego, San Diego; ²Tandem Diabetes Care, Inc., San Diego

Introduction

The t:slim X2 insulin pump with Control-IQ advanced hybrid closed-loop technology is designed to help improve sensor time in range (TIR) (70-180 mg/dL) using CGM values to predict glucose levels 30 minutes ahead and adjust insulin dosing accordingly.

The Control-IQ Observational (CLIO) study is an IRB-approved, single-arm, longitudinal study evaluating real-world use of Control-IQ technology in diverse groups of people with T1D (PWT1D) from the United States (NCT04503174).

Recently published data from the CLIO study demonstrated significantly improved glycemic metrics irrespective of participants' age, previous delivery method, and baseline HbA1c after using Control-IQ technology for 9 months.

Aim

To examine glycemic outcomes in adult participants who had completed the 12-month CLIO study.

Method

We evaluated relationships between baseline HbA1c, Glucose Management Indicator (GMI) derived from CGM data, age, and previous insulin delivery method for adult participants completing the CLIO study.

Adult participants (≥18 years) who had ≥75% overall CGM use during their 12 months as part of the study were included in the analysis.

Outcomes were analyzed using a Wilcoxon test.

Results

Study sample included 1,107 participants (female=57.2%; White=92.6%). Participants' median age was 41 years (IQR=30-54). Majority of participants had been using an insulin pump (n=882) as prior therapy (vs. prior MDI, n=225) before transitioning to Control-IQ technology.

Outcomes by prior therapy modality and age group: (Table 1)

Prior MDI users reported higher HbA1c at baseline (7.7% [IQR=6.8-9.0]) vs. prior pumpers (7.2% [6.7-8.0]) (Figure 1). However, GMI at 12 months reflected glycemic improvements across all prior therapy modalities (MDI=7.0% [6.7-7.3]; pump=7.1% [6.7-7.4]) (p<0.0001).

Median GMI for the sample overall was significantly lower at 12 months (7.0%) vs. baseline HbA1c

TABLE 1
Comparison of baseline HbA1c (Median) with GMI (Median) after 12 months of using Control-IQ technology by study participants' age and prior therapy

Participants' Age Group	Previous Insulin Delivery Method	n	Median Baseline HbA1c (IQR)	Median GMI at 12 Months with Control-IQ technology (IQR)	p value
18-30 Years	Insulin Pump	203	7.4 (6.7-8.2)	7.2 (6.8-7.5)	p<0.001
	MDI	90	7.4 (6.4-8.7)	6.9 (6.6-7.3)	p<0.001
31-45 Years	Insulin Pump	293	7.2 (6.6-8.0)	7.1 (6.7-7.4)	p<0.001
	MDI	65	8.0 (6.9-10.0)	7.0 (6.7-7.4)	p<0.0001
46-64 Years	Insulin Pump	274	7.2 (6.8-7.9)	7.0 (6.7-7.3)	p<0.0001
	MDI	57	7.8 (7.0-8.9)	7.0 (6.7-7.3)	p<0.0001
≥ 65 Years	Insulin Pump	107	7.0 (6.6-7.5)	6.9 (6.6-7.2)	p<0.005
	MDI	11	7.5 (6.9-8.1)	7.0 (6.8-7.3)	P<0.05
≥ 18 Years	Insulin Pump	877	7.2 (6.7-8.0)	7.1 (6.7-7.4)	p<0.0001
	MDI	223	7.7 (6.8-9.0)	7.0 (6.7-7.3)	p<0.0001

(7.2%) (p<0.0001). Participants ages 18-30 and 46-64 showed the greatest improvement from baseline (0.3% reduction) (p<0.0001), while older adults (≥65-years) showed the lowest GMI at study end (6.9% [6.6-7.2]).

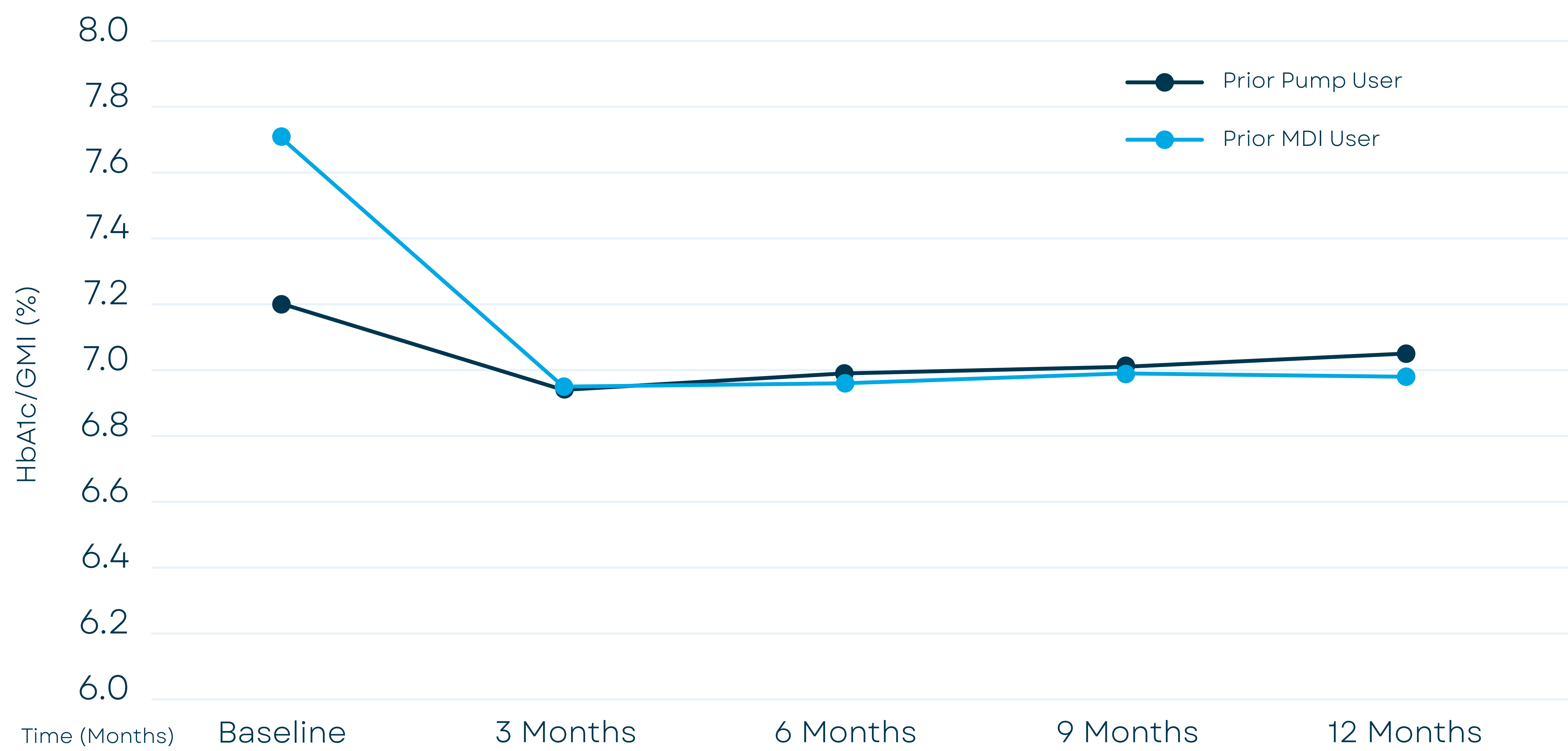
Conclusions

This real-world evidence demonstrates significant glycemic improvements with Control-IQ technology in adults, regardless of prior therapy modality, that are sustained long-term across diverse age groups of users.

Acknowledgments:

The authors would like to acknowledge and thank all our participants for contributing to this research study.

FIGURE 1
Comparison of baseline HbA1c and GMI at 3, 6, 9 and 12 months based on prior therapy modality for adult participants in the CLIO study.



Corresponding author: Jordan Pinsker, 10935 Vista Sorrento Pkwy, San Diego CA 92121. Email: jpinsker@tandemdiabetes.com

References: 1. Brown SA, Kovatchev BP, Raghinaru D, et al. Six-month randomized, multicenter trial of closed-loop control in type 1 diabetes. *N Engl J Med.* 2019;381(18):1701-1717. 2. Breton MD, Kovatchev BP. One year real-world use of the Control-IQ advanced hybrid closed-loop technology. *Diabetes Technol Ther.* 2021;23(9):601-608. 3. Graham R, Singh H, Mueller L, et al. Glycemic outcomes by age and previous insulin delivery method in Control-IQ technology users: 9 months of CLIO study data. *Diabetes Technol Ther.* 2022;24(1):A-66.

© 2022 Tandem Diabetes Care, Inc. All rights reserved. Tandem Diabetes Care, Control-IQ, and t:slim X2 are either registered trademarks or trademarks of Tandem Diabetes Care, Inc. in the United States and/or other countries. All third-party marks are the property of their respective owners. CM-002223_A

