

Efficacy of Real-Time Continuous Glucose Monitoring in Type 1 Diabetic pre-school and school children treated with Multiple Daily Injections

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BACKGROUND

Young children affected by Type 1 Diabetes (T1D) are prone to fluctuation in glucose levels and hardly reach a stable good glycometabolic control, especially when treated with Multiple Daily Insulin Injections (MDI). The recent Real-Time Continuous Glucose Monitoring (RT-CGM) System, Dexcom G5, the only available device registered for non-adjunctive insulin intervention, potentially facilitates a better management of the disease, mostly due to hypo and hyperglycemia alerts and glucose trend's arrows.

AIM OF THE STUDY

To evaluate the effect of the RT-CGM on glycometabolic control, glucose variability and hypoglycemic risk in T1D children under 10 years, treated with MDI, compared to a control group traditionally monitored with Self Monitoring of Blood Glucose (SMBG).

RESULTS

HbA1c resulted significantly reduced at T2 in the RT-CGM treated groups as compared to control groups ($7,2 \pm 0,72\%$ vs $7,7 \pm 0,94\%$; $p < 0.007$ - FIG.1). TIR resulted significantly ($p < 0.03$) increased at T2 in the integrated RT-CGM treated group (FIG.2). In particular, the increase of TIR at T2 was observed for both CGM groups (FIG.3), at onset and during consolidated T1D.

Reduction of Time in Hypo was reported for all patients using CGM, both at onset of diabetes and also during consolidated disease.

Patients and Methods. It is an observational study. 73 T1D children < 10 years of age were enrolled and were subdivided into four groups:

- 21 children at onset of diabetes monitored with RT-CGM Dexcom G5
- 29 control children at onset of diabetes monitored with SMBG
- 10 children with consolidated T1D (Disease Duration > 1 year) monitored with RT-CGM Dexcom G5
- 13 control children with consolidated T1D monitored with SMBG

	G5 at onset	Controls at onset	G5 in follow up patients	G5 in follow up patients
Age 0 (years)	4,3 ± 2,39	4,0 ± 1,79		
Age x (years)			7,0 ± 2,17	6,7 ± 2,60
HbA1c 0 (%)	10,9 ± 2,02	10,7 ± 1,26		
HbA1c X (%)			7,5 ± 0,45	7,8 ± 1,14

After 12 (T1) and 24 weeks (T2) HbA1c, Time in Range (70-180 mg/dl), Time in Hypo (< 70 mg/dl), Time in Hyper (> 180 mg/dl) and Coefficient of Variation (CV) were evaluated.

Fig. 1 HbA1c at T2

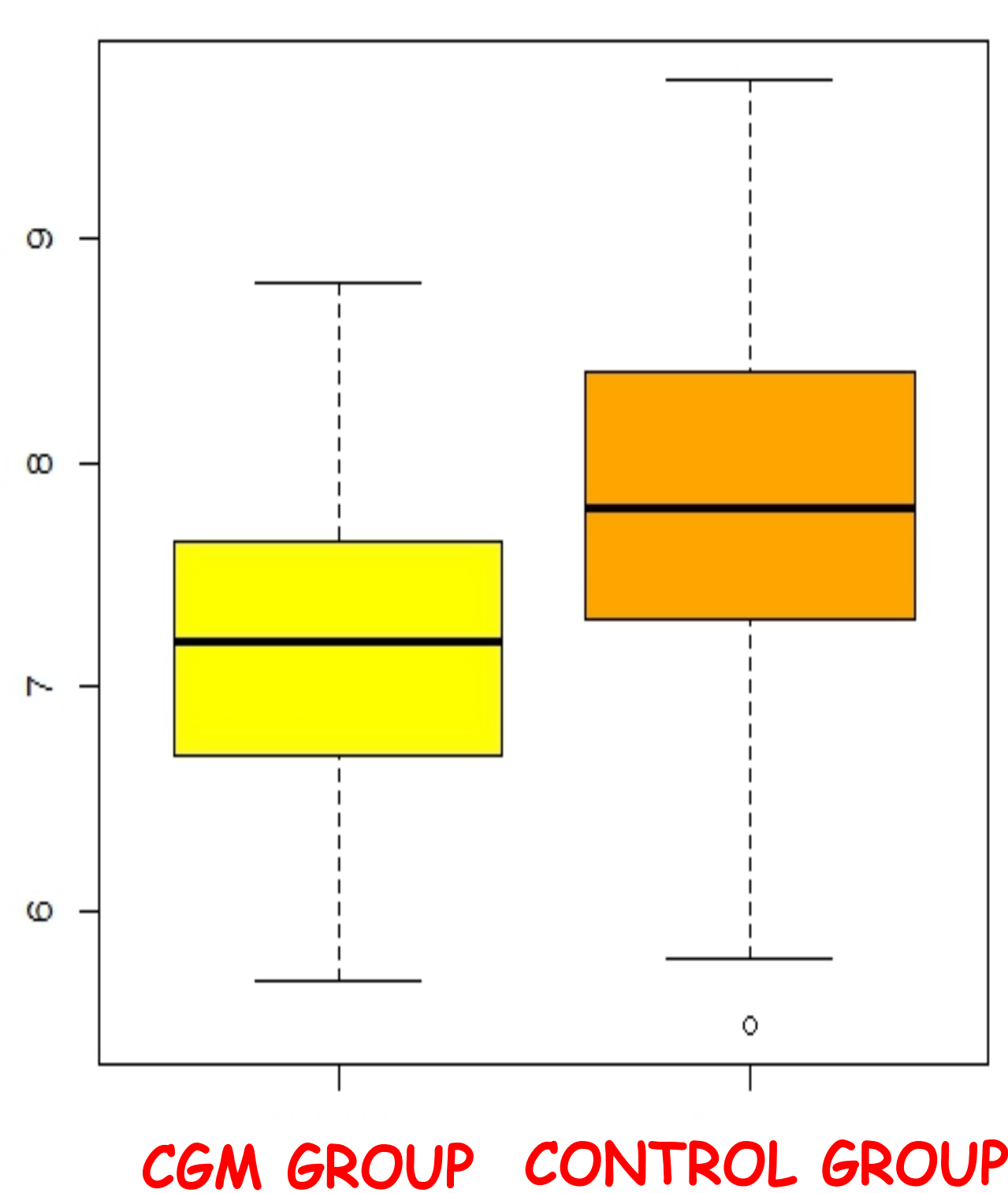


Fig. 2 TIR IN THE INTEGRATED CGM GROUP

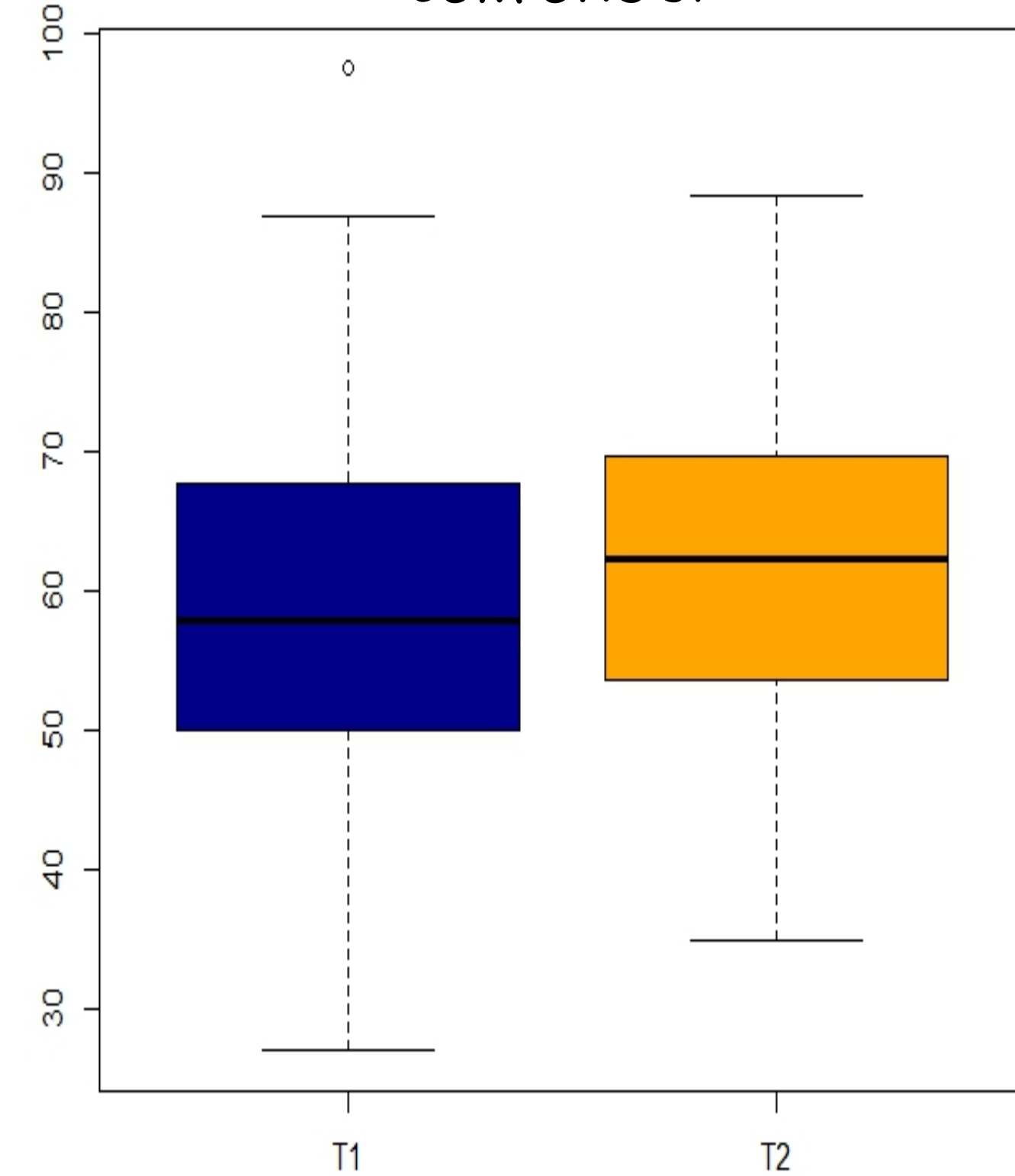
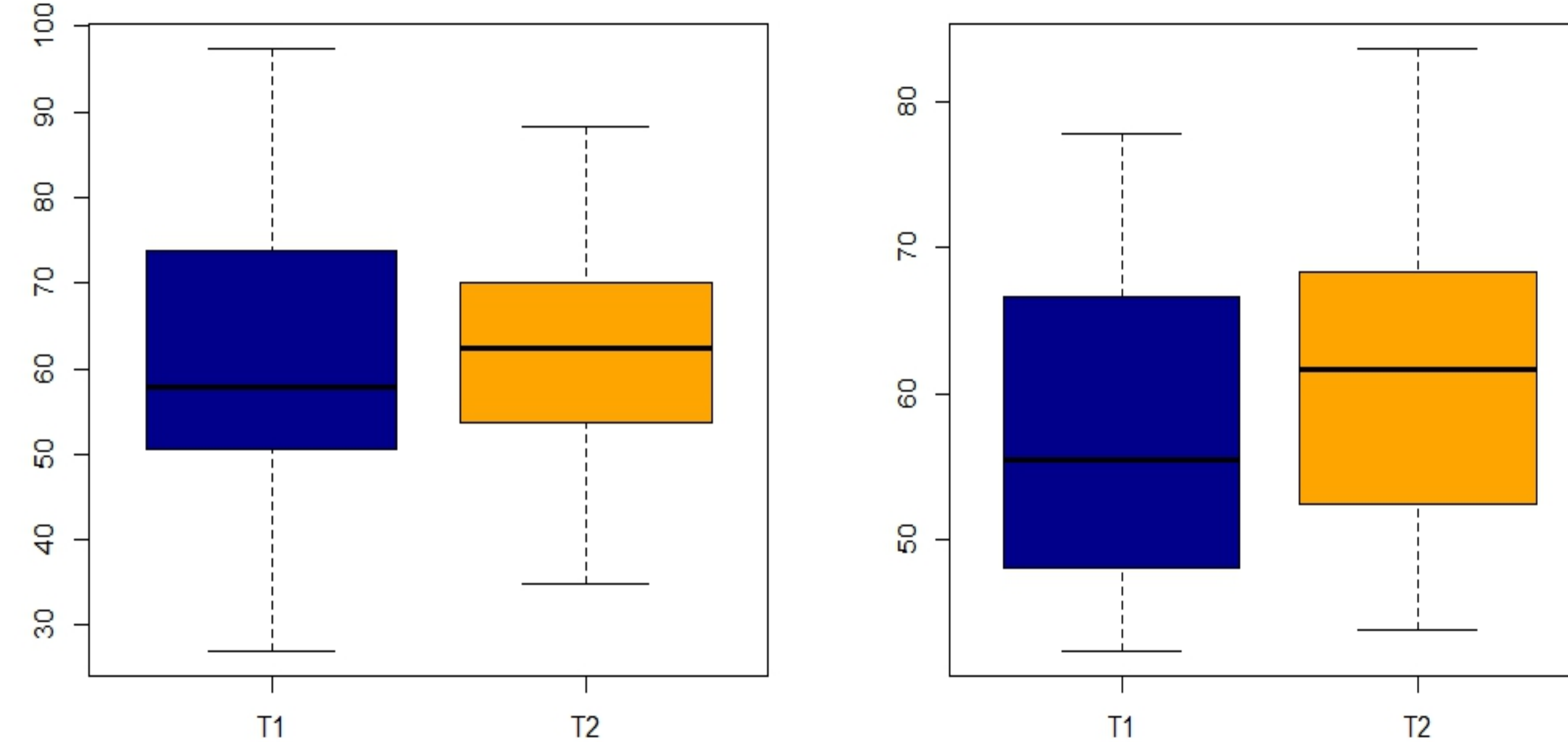


Fig. 3 TIR RESPECTIVELY AT ONSET AND DURING CONSOLIDATED T1D



CONCLUSIONS.

RT-CGM Dexcom G5 was proven to have a clinically significant effect on glucose control and glucose variability in very young children with T1D treated with a MDI scheme, both at onset of diabetes and during disease's follow-up.

REFERENCES

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