Adjunctive therapy with Dapagliflozin improves Full Closed Loop post prandial glycaemic control in Type 1 diabetic young adults - The DAPADream

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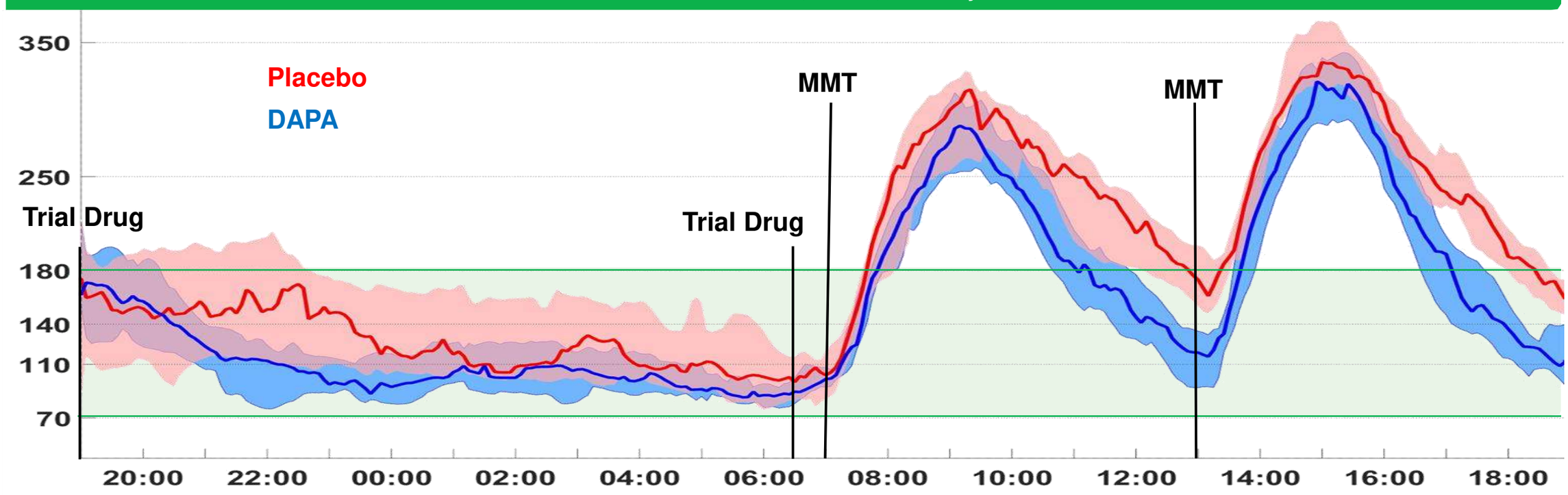

Fig.1: Median (25., 75. Quart.) Glucose Sensor curves under Full closed loop control with Dapagliflozin or Placebo

Introduction

Dapagliflozin (DAPA) as an SGLT2-Inhibitor is currently discussed as adjunct therapy in Type 1 diabetes.

The DreaMed Substance Administration System with fuzzy logic closed loop algorithm is proven to be safe and effective in hybrid closed loop settings. In full closed loop (FCL) settings, postprandial time is always a phase of high glucose excursions. The aim of the present trial is to investigate the effect of DAPA on glucose levels after an unannounced meal under FCL conditions.

Methods

Eligible patients (T1DM, CSII, non-severe obese) were admitted for 24 hours of FCL in this monocentric, double-blind, randomized, placebo-controlled cross-over trial on two occasions.

Patients received 10 mg DAPA or placebo twice. Two mixed meal tests were performed.

Glucose control was achieved by DreaMed FCL.

Primary outcome was “Time in Range 70- 180 mg/dl” (TIR).

Results

Participants were 15 young adults (9 female) with mean [IQRange] of age 19 [18-20], HbA1c 8.3 % [7.1-10.4]. TIR with DAPA increased significantly overall and during postprandial phase, urinary glucose excretion raised threefold (Tab. 1). Time above 180 mg/dl was significantly decreased. No increase below 70 mg/dl and no serious ketosis was observed.

Table 1: Glycemic Parameters during Full Closed Loop Control

	DAPA	Placebo	p-value
Time within 70-180 mg/dl [%]			
24h	68.40 (60.68, 70.77)	50.35 (45.56, 56.16)	<0.001
7am-7 pm	41.67 (33.23, 47.22)	18.75 (14.04,29.83)	<0.001
11 pm-7am	100.00 (93.17,100)	90.63 (77.27,100)	0.123
Time above 180 mg/dl [%]	29.17 (26.39, 36.84)	45.49 (42.45, 54.21)	<0.001
Total Daily Dosis [U]	27.75 (22.44, 34.29)	39.36 (28.65, 43.78)	0.001
Bolus Insulin [U]	9.65 (8.13, 12.46)	16.00 (13.41, 19.16)	<0.001
Basal Insulin [U]	17.33 (14.50, 21.78)	22.51 (15.38, 27.14)	0.008
Urinary glucose excretion [mg/24h]	149,331±42,057	48,520 ± 22,618	<0.001

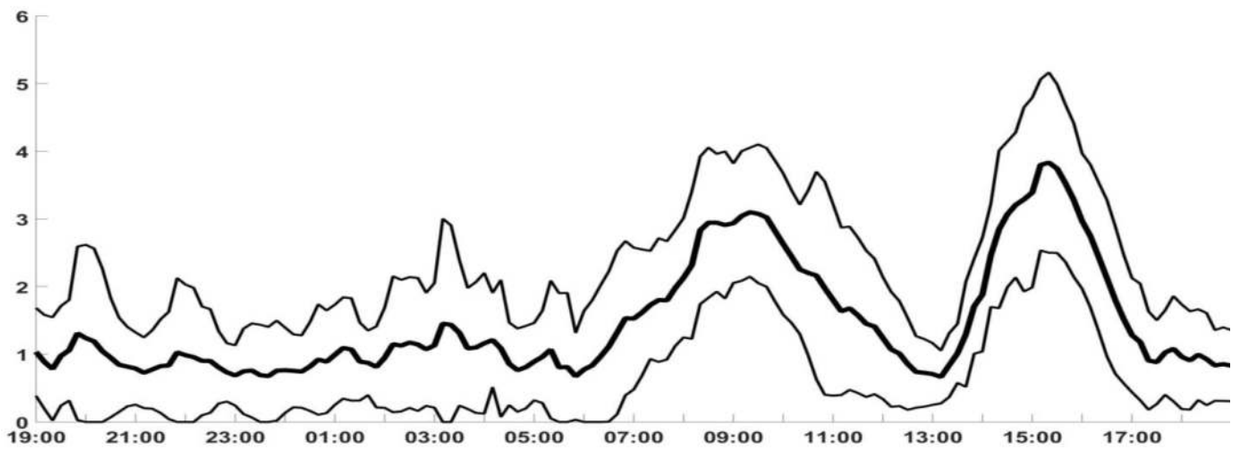

Fig. 2a: Median (and Quart.) Insulin Administration after DAPA

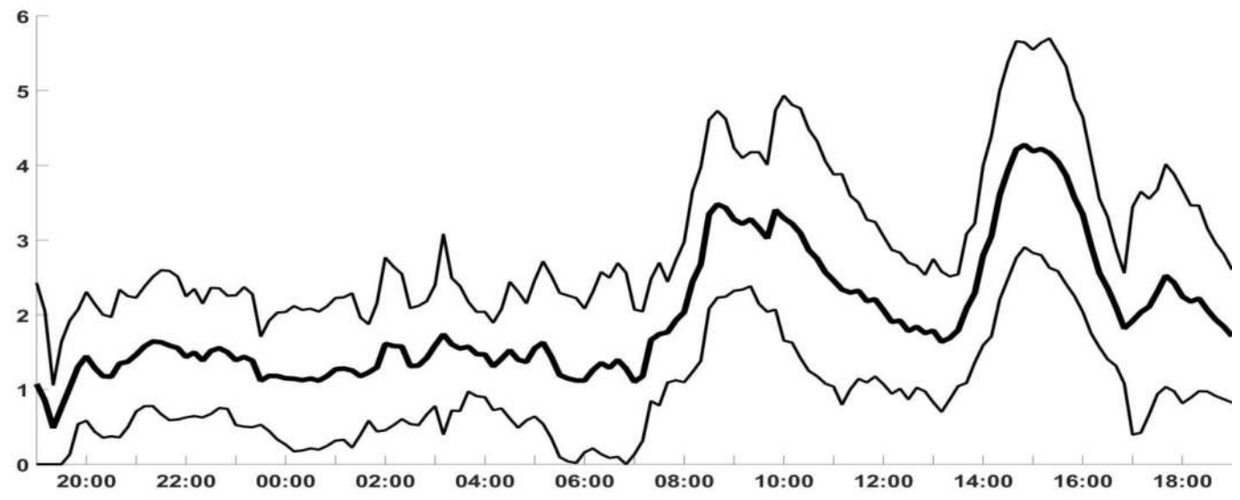

Fig. 2b: Median (and Quart.) Insulin Administration after Placebo

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Study supported by Astra Zeneca

Conclusions

- For young adults with T1D, use of DAPA combined with FCL was beneficial concerning TIR.
- Average TIR was increased by 2.8 hours compared to placebo despite two unannounced meals.
- Bolus and basal insulin was reduced in FCL.
- SGTL2 inhibition appears to be a safe and effective adjunction in FCL.

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