

EFFECT OF DIABETES-SPECIFIC ORAL NUTRITIONAL SUPPLEMENTS ON POSTPRANDIAL GLYCEMIC RESPONSE IN ADULTS WITH TYPE 2 DIABETES MELLITUS

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BACKGROUND

- Diabetes affects 34.1 million US adults, including >1 in 4 over the age of 65 years old.¹ Approximately 1 in 5 hospitalizations involves a patient with diagnosed diabetes, indicating a high prevalence in both the hospital and community setting.²
- Nutrition plays an integral role in the overall management of diabetes, and oral nutritional supplements (ONS) are often used to help fill nutritional gaps.
- Understanding the effects on postprandial glucose response is an important factor in selecting an appropriate ONS for people with diabetes.

OBJECTIVES

- The primary objective of this study was to determine if two diabetes-specific ONS (DS-ONS) provide improved postprandial blood glucose response relative to a standard ONS in individuals with type 2 diabetes (T2DM).

METHODS

- This randomized, crossover clinical trial enrolled 14 adults with controlled T2DM.
- Subjects were randomized to one of three interventions on three separate study days, each one week apart. Participants consumed isocaloric amounts of two different DS-ONS (BOOST Glucose Control® Drink institutional [DS-ONS1] and BOOST Glucose Control® Drink retail [DS-ONS2]) as well as a standard ONS (control) (Table 1).
- Blood glucose and serum insulin values were measured at baseline and 10, 20, 30, 60, 90, 120, 150, 180, 210 and 240 minutes after consumption and used to calculate the area under the curve (AUC) as well as peak (Cmax) blood glucose and insulin concentrations for each participant.
- Participants were instructed not to take any diabetes medications before or during the 4-hour intervention visits.

Table 1. Nutritional Profile of two DS-ONS and Standard ONS

	Control	DS-ONS1	DS-ONS2
Volume, mL	188	180	237
Calories	190	190	190
Protein, g	7.9 (17% TE)	11 (23% TE)	16 (33% TE)
Carbohydrate, g	32 (68% TE)	17 (33% TE)	16 (34% TE)
Sugars, g	16	5	4
Fiber, g	0	2	3
Fat, g	3.2 (15% TE)	9 (44% TE)	7 (33% TE)

TE = total energy

RESULTS

- All 14 participants completed the study. Data for two participants were excluded as outliers due to unlikely blood glucose values, leaving 12 individuals included in the analysis.

Subject Demographics (N=12)

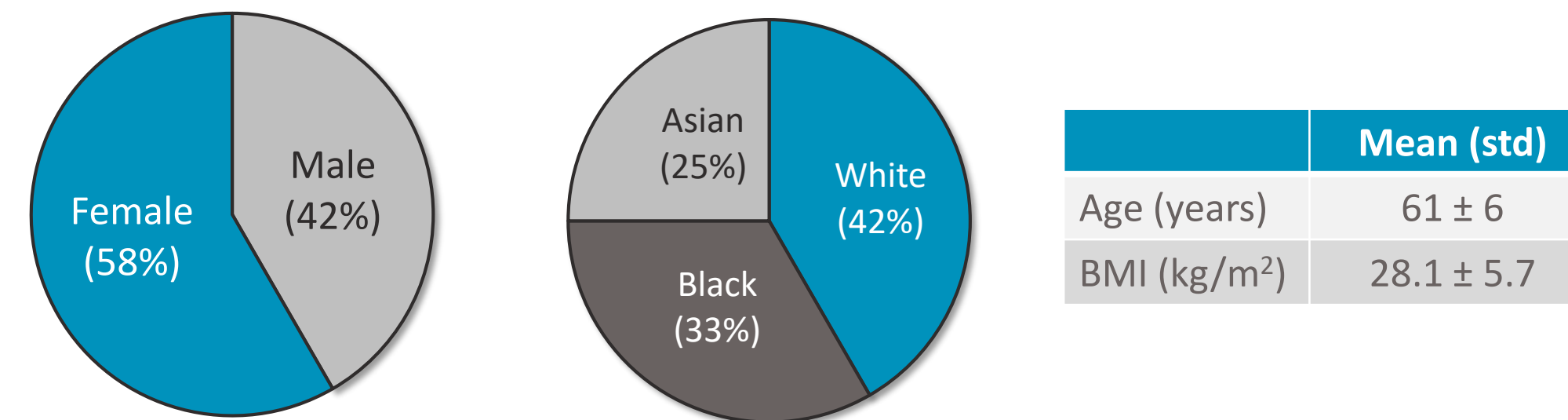
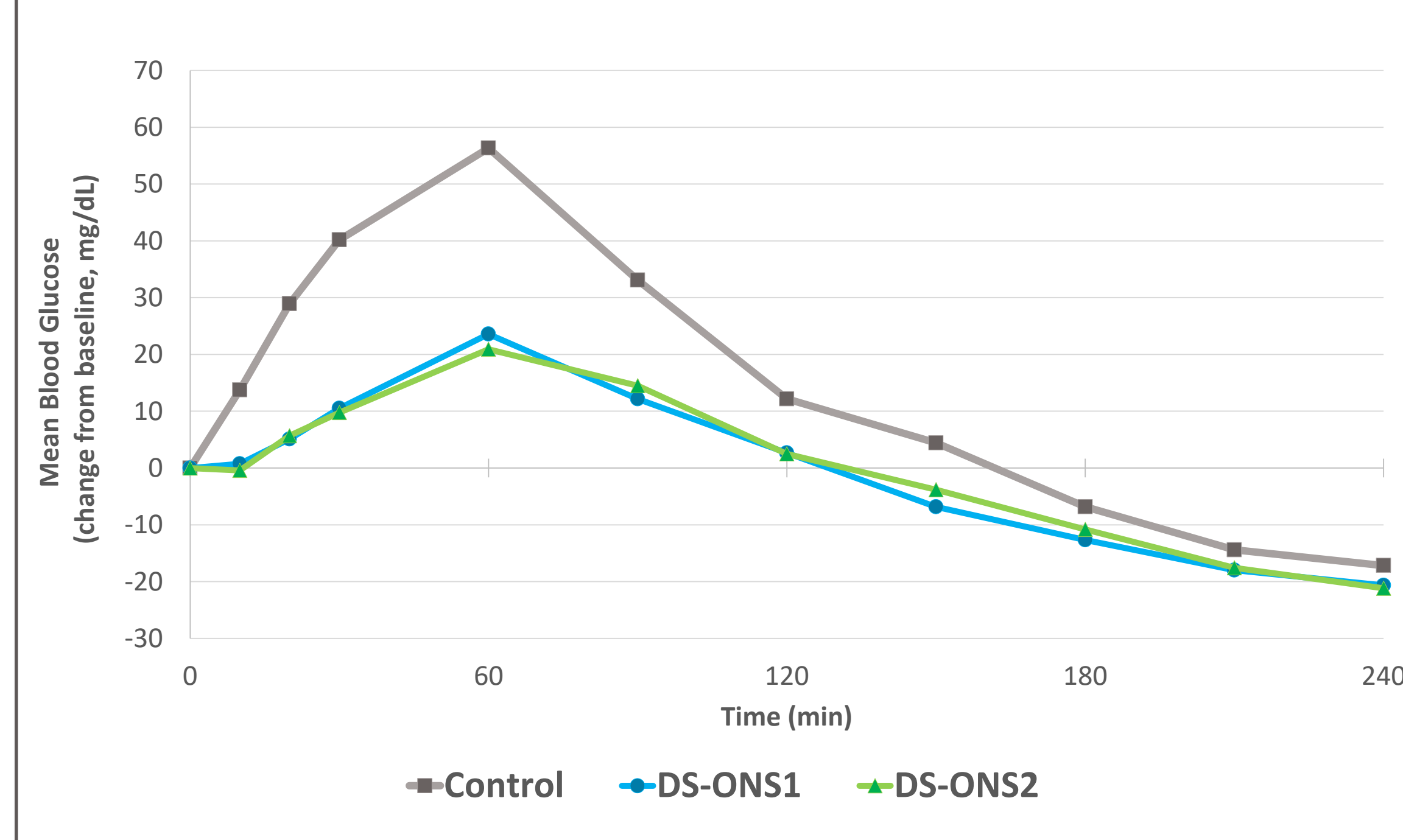


Figure 1. Mean Blood Glucose Levels change from Baseline over 4 Hours



RESULTS

- There were no differences in blood glucose levels at baseline (p=0.38).
- As shown in Figure 1 and Table 2, mean blood glucose AUC and Cmax for blood glucose were significantly lower for both DS-ONS vs. control (p<0.01 for all comparisons).
- Cmax for insulin was significantly lower for both DS-ONS vs. control (p<0.01 for both comparisons), but there were no differences in insulin AUC (p=0.08), first-phase insulin response (AUC0-30 min, p=0.054) or insulinogenic index (p=0.47) among the three products.

Table 2. Glucose and insulin responses for two DS-ONS vs. control (standard ONS)

	Control	DS-ONS1	DS-ONS2
Glucose AUC _{0-240 min} , mg/dL	3515±5205	-14±3422*	100±3484*
Glucose Cmax, mg/dL	189±48	162±43*	151±30*
Insulin AUC _{0-240 min} , μIU/mL	1773±2213	504±1136	680±769
Insulin AUC _{0-30 min} , μIU/mL	194±224	59±144	102±240
Insulin Cmax, μIU/mL	37±33	22±22*	19±22*
Insulinogenic Index, μIU/mmol	8.4±8.7	8.9±13.8	14.2±22.6

Values are mean± standard deviation; *p<0.01 vs. control
 Pairwise p-values have Bonferroni adjustment for multiple comparisons

CONCLUSION

- DS-ONS attenuated the overall blood glucose response and produced lower postprandial blood glucose peaks compared to a standard ONS.
- Specially formulated DS-ONS can be a useful tool to provide nutritional support as part of an overall diabetes management plan in individuals with T2DM.

REFERENCES

- US CDC National Diabetes Statistics Report, 2020
- Umpierrez GE et al. JCEM 2012;97(1):16-38.