

Effect of Inulin on Glucose Homeostasis in Subjects with Prediabetes

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Fermentable carbohydrates have been shown to improve insulin sensitivity and glucose homeostasis in normoglycaemic and insulin-resistant subjects^(1–3). Subjects with prediabetes have marked insulin resistance and are at higher-risk of developing diabetes when compared with normoglycaemic subjects. This study aimed to investigate the effect of inulin on glucose homeostasis in subjects with Impaired Fasting Glucose (IFG), Impaired Glucose Tolerance (IGT) and IFG/IGT.

In a double-blind and placebo-controlled crossover study, 36 overweight prediabetic volunteers were randomly allocated to receive 30 g/d inulin or cellulose for 2 weeks following a four-week run-in. Fasting insulin and glucose were measured for all subjects before and after the intervention. Following a four-week wash-out period subjects repeated the protocol with the alternate supplementation. Paired and independent *t*-tests were used to examine within and between group differences respectively.

33 subjects completed the inulin arm of the study, 32 subjects completed the cellulose arm. Of these, 7 had IFG, 11 had IGT and 13 had IFG/IGT. Subjects lost significantly more weight when taking the inulin supplementation compared to the cellulose (Table 1). There was no effect on fasting insulin or glucose (Table 1). When the data were analysed by prediabetic category, there was a significant reduction in fasting insulin ($P=0.05$) in subjects with Impaired Fasting Glucose, and no change in the IGT group. The delta change for HOMA-IR following inulin supplementation was significantly different between the IFG and IGT groups. There was no difference in weight loss between the IFG and IGT groups ($P=0.43$).

Table 1. Pre and post measures for glucose, insulin, HOMA IR and weight for all subjects

		Pre	SE	Post	SE	Δ	SE
Glucose (mmol/L)	Inulin	5.9	0.1	5.9	0.1	0.01	0.2
	Cellulose	6.0	0.1	6.19	0.1	0.07	0.1
Insulin (μU/ml)	Inulin	25.6	3.0	23.0	2.7	-2.6	4.0
	Cellulose	26.0	2.6	24.1	3.4	-1.9	4.2
HOMA IR	Inulin	6.6	0.8	5.8	0.7	-0.7	1.1
	Cellulose	5.7	0.8	5.7	0.9	0.1	1.2
Weight (kg)	Inulin	84.5	2.4	84.0	2.2	-0.5	3.2
	Cellulose	86.0	2.4	87.2	2.4	1.2	3.5

*Post-intervention value significantly different from pre-intervention value (within group difference) $p < 0.05$. **Delta change for inulin group significantly different to delta change for cellulose group (between group difference). $P < 0.05$.

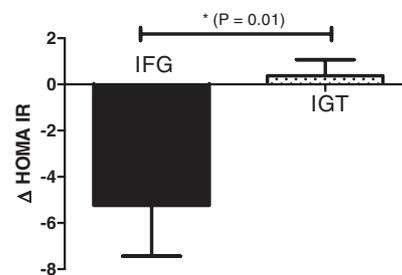


Fig. 1. Δ change in HOMA IR Following inulin supplementation between IFG and IGT groups.

Inulin may improve hepatic insulin resistance in subjects with IFG. Successful interventions for improving glucose homeostasis in subjects at risk of diabetes may need to be targeted to the individual's prediabetic state.

This work was supported by a Diabetes UK Allied Health Professional Fellowship.

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