Relative effects of high-carbohydrate diets (high and low glycaemic index) versus high-monounsaturated fat diets in NIDDM

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Diets high in monounsaturated fat (1) as well as diets high in carbohydrates with low glycaemic index (GI) (2) have, in separate experiments, been shown to be of therapeutic benefit in NIDDM. However, their relative benefits have not been assessed simultaneously.

We examined the effect of high and low glycaemic index (GI) carbohydrates, and monounsaturated-fats on the control of blood glucose and lipid metabolism in 14 male and 7 female free-living variably controlled NIDDM subjects. Each subject consumed a) a high-GI diet (53% CHO - 21% Fat, 63 GI units), b)a low-GI diet (51% CHO - 23% Fat, 43 GI units), and c) a high-MONO diet (42% CHO - 35% Fat, 59 GI units) in random order and cross-over fashion. Approximately 45% energy was provided as key foods which differed in published GI values and specifically excluded legumes. Weight was not significantly different between dietary interventions, nor was saturated fat intake.

	High-GI Diet[1]	Low-GI Diet[1]	High-Mono Diet[1]
Total cholesterol (mmol/L)	5.44 ± 0.21	5.38 ± 0.23	5.35 ± 0.23
Triglycerides (mmol/L)	1.80 ± 0.37	1.47 ± 0.19	1.77 ± 0.39
HDL cholesterol (mmol/L)	0.88 ± 0.04[2]	0.93 ± 0.04	0.93 ± 0.04
LDL cholesterol (mmol/L)	3.75 ± 0.21	3.79 ± 0.21	3.62 ± 0.22
Plasma glucose (mmol/L)	9.8 ± 0.8	9.7 ± 0.7	9.9 ± 0.7
Urinary glucose (mmol/24hr)	101 ± 47	75 ± 20	82 ± 27
Fructosamine (μmol/L)	328 ± 12	322 ± 11	325 ± 12
Plasma Insulin (μU/ml)	12.4 ± 1.0	14.2 ± 1.4	13.5 ± 1.1
24h urinary C-peptide (nmol/24hr)	144 ± 12	153 ± 23	124 ± 14

[1] Values are given as Mean ± SEM [2] $P<0.05$ vs low-GI and high-MONO

HDL-cholesterol was 6% higher on both the low-GI and high-MONO diets compared to the high-GI diet ($P<0.05$). There were no other significant differences between diets, even when adjusted for BMI, glucose control or gender. The low-GI diet did produce a lower post-prandial peak glucose response than the other two diets ($P = 0.03$) but this was not sustained over the whole day. We conclude that over a 4-wk period, high-MONO and high-CHO, low-GI diets are marginally superior to high-CHO, high-GI diets with respect to lipid and/or glucose metabolism in NIDDM subjects.

1. Campbell LV, Marmot PE, Dyer JA. The high-monounsaturated fat diet as a practical alternative for NIDDM. Diabetes Care 1994;17:177-182.
2. Brand Miller J. The importance of glycaemic index in diabetes. Am J Clin Nutr 1994;59(supp):747S-52S.