Effect of a high protein, energy restricted diet on body composition, glycaemic control and lipid levels in hyperinsulinemic subjects

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Background: It is not clear whether varying the protein-to-carbohydrate ratio of weight loss diets benefits body composition or metabolism. One previous study in subjects with type 2 diabetes has shown that replacing protein for carbohydrate in a weight loss diet resulted in greater abdominal fat loss in women (1).

Objective: To compare two weight loss diets differing in carbohydrate/protein ratio on body composition, glucose and lipid metabolism and markers of bone turnover in subjects with elevated plasma insulin.

Design: Parallel design with interventions either a high protein diet from meat, poultry and dairy foods (HP; 27% of energy as protein, 44% carbohydrate) or a standard protein diet low in meat, poultry and dairy foods (SP; 16% energy as protein, 57% carbohydrate) during 12 weeks of energy restriction (6.5 MJ/day) and 4 weeks of energy balance (8.2 MJ/day). Fifty-seven overweight volunteers with fasting insulin >12mU/L completed the study.

Test Meals

HP (high protein) meal
2715 kJ
32% protein energy
54% carbohydrate energy
14% fat energy
SP (standard protein) meal
2747 kJ
10% protein energy
77% carbohydrate energy
13% fat energy

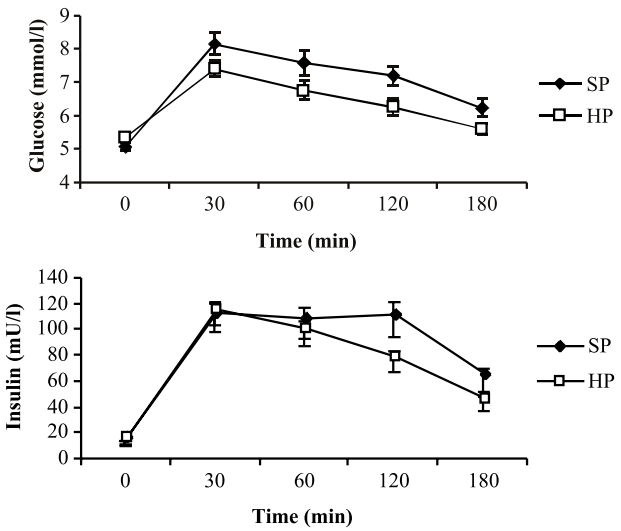

Figure 1. % difference (high GI- low GI) in glycated protein

Results: Weight loss (–7.9 ± 0.5 kg) and total fat loss (–6.9 ± 0.4 kg) was not different between diets. Total lean mass was preserved more in the females on HP (–0.1 ± 0.3 kg) than SP (–1.5 ± 0.3 kg) (P = 0.02). The glycaemic response to the HP meal was less than to the SP meal at weeks 0 and 16 (P = 0.027) (see figure). After weight loss the glycaemic response decreased to a greater extent in the HP group (P = 0.049). The reduction in serum triacylglycerol concentrations was greater on HP (23%) than SP (10%) (P < 0.05). Markers of bone turnover, calcium excretion and systolic blood pressure were unchanged.

Conclusion: Replacing carbohydrate with protein from meat, poultry and dairy foods has beneficial metabolic effects and no adverse effects on markers of bone turnover or calcium excretion.

Reference

1. Parker B, Noakes M, Luscombe N, Clifton P. Effect of a high-protein, high-monounsaturated fat weight loss diet on glycemic control and lipid levels in type 2 diabetes. Diabetes Care 2002; 25(3):425–30.

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