

Concurrent Session 3: Regulation of Protein Metabolism

High protein or high carbohydrate diet for type 2 diabetes: does it matter?

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Background – Medical nutrition therapy for the management of type 2 diabetes (T2DM) is focussed on weight, glycaemic control and plasma lipids. Higher protein diets, when compared to high carbohydrate, low fat diets, may be beneficial for weight loss; effects on plasma lipids is variable. High protein diets, because weight and glycaemic control are related, may also result in improved glycaemic control.

Objectives – To compare and contrast a higher protein (HP) diet with a high carbohydrate (HC) diet in free-living people with T2DM.

Design – One year, randomised trial of HP vs HC nutrition education given by a dietitian in three sessions over a period of three months. At baseline, 12 weeks and one year anthropometric measurements were taken; three-day weighed food records and blood samples for biochemical analyses were collected; questionnaires relating to exercise and quality of life were completed. Participants' food preferences were defined at the start of the study.

Outcomes – 123 subjects randomised to either HC (n=61) or HP (n=62) group. All values are least squares means \pm 95% confidence interval of the least squares means. Weight was significantly ($p=0.001$) lower at one year compared to baseline for participants consuming the HC diet (88.4 ± 4.3 kg vs 86.8 ± 4.3 kg) and significantly ($p<0.001$) lower for participants consuming the HP diet (87.5 ± 4.3 kg vs 85.7 ± 4.3 kg). Lipids improved in both groups but there was no change in glycaemic control. There was no difference between groups. Participants in the HP group did not follow the advice to eat a HP diet.

Conclusion – Neither the HC nor the HP diet proved superior in the management of people with T2DM. The study suggests that it is more difficult for people to follow advice to eat a HP diet compared to a HC diet. However, it may suit some motivated individual patients and it may help them to lose more weight, but implementation at a mass level appears impractical.

The effect of a high protein vs high carbohydrate diet on cardiovascular risk factors

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Background – The effects of high protein and high carbohydrate diets on cardiovascular risk factors are inconclusive. Few studies have examined the long-term effects in a free-living population.

Objective – To determine the long-term effects of a high protein versus a high carbohydrate diet on cardiovascular risk factors post-weight loss.

Design – One hundred and forty one overweight and obese subjects who had previously lost $\geq 10\%$ of their body weight using a very low energy diet (VLED) for 12 weeks were randomised to a high protein (HP) or high carbohydrate (HC) iso-energetic diet for weight maintenance, or further weight loss if necessary, for 12 months.

Outcomes – Both dietary groups maintained their initial weight loss over the 12 month follow-up period. There was no significant difference in weight loss between the dietary groups at any time point. Total cholesterol and triglyceride levels were significantly reduced after the VLED and remained lowered throughout the trial for all subjects. After six months dietary treatment, the HP group experienced a significant increase in High Density Lipoprotein (HDL) cholesterol compared to the HC group ($P=0.036$). The difference was close to significant at 12 months ($P=0.06$). Pairwise comparisons across all individuals revealed a significant mean decrease in SBP of 13.5mmHg ($P<0.001$) from baseline to the end of month 3. After randomization at month 3, no significant difference in mean SBP decrease from baseline was detected between the two groups at this time ($P=0.375$) or at month 9 ($P=0.194$). However, by study completion the mean decrease of 14.3mmHg in SBP from baseline for the HP group was significantly larger than 7.7mmHg for the HC group ($P=0.045$). On average, whilst individuals in the HC group struggled to maintain their initial reduction in SBP, those in the HP group did not.

Conclusion – Despite there being no difference in weight loss achieved by the two dietary groups, the HP diet appeared to confer beneficial effects on HDL cholesterol and SBP in the medium to long-term.

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