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Relatively high-protein or 'low-carb' energy-restricted diets for body weight loss and body weight maintenance? ☆ ☆☆

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Abstract

Background

'Low-carb' diets have been suggested to be effective in body weight (BW) management. However, these diets are relatively high in protein as well.

Objective

To unravel whether body-weight loss and weight-maintenance depends on the high-protein or the 'low-carb' component of the diet.

Design

Body-weight (BW), fat mass (FM), blood- and urine-parameters of 132 participants (age = 50 ± 12 yr; BW = 107 ± 20 kg; BMI = 37 ± 6 kg/m^2; FM = 47.5 ± 11.9 kg) were compared after 3 and 12 months between four energy-restricted diets with 33% of energy requirement for the first 3 months, and 67% for the last 9 months: normal-protein normal-carbohydrate (NPNC), normal-protein low-carbohydrate (NPLC); high-protein normal-carbohydrate (HPNC), high-protein low-carbohydrate (HPLC); 24 h N-analyses confirmed daily protein intakes for the normal-protein diets of 0.7 ± 0.1 and for the high-protein diets of 1.1 ± 0.2 g/kg BW ($p < 0.01$).

Results

BW and FM decreased over 3 months ($p < 0.001$): HP (− 14.1 ± 4 kg; − 11.9 ± 1.7 kg) vs. NP (− 11.5 ± 4 kg; − 9.3 ± 0.7 kg) ($p < 0.001$); LC (− 13.5 ± 4 kg; − 11.0 ± 1.2 kg) vs. NC (− 12.3 ± 3 kg; − 10.3 ± 1.1 kg) (ns). Diet × time interaction showed HPLC (− 14.7 ± 5 kg; − 11.9 ± 1.6 kg) vs. HPNC (− 13.8 ± 3 kg; − 11.9 ± 1.8 kg) (ns); NPLC (− 12.2 ± 4 kg; − 10.0 ± 0.8 kg) vs. NPNC (− 10.7 ± 4 kg; − 8.6 ± 0.7 kg) (ns); HPLC vs. NPLC ($p < 0.001$); HPNC vs. NPNC ($p < 0.001$). Decreases over 12 months ($p < 0.001$) showed HP (− 12.8 ± 4 kg; − 9.1 ± 0.8 kg) vs. NP (− 8.9 ± 3 kg; − 7.7 ± 0.6 kg) ($p < 0.001$); LC (− 10.6 ± 4 kg; − 8.3 ± 0.7 kg) vs. NC (11.1 ± 3 kg; 9.3 ± 0.7 kg) (ns). Diet × time interaction showed HPLC (− 11.6 ± 5 kg ; − 8.2 ± 0.7 kg) vs. HPNC (− 14.1 ± 4 kg; − 10.0 ± 0.9 kg) (ns); NPNC (− 8.2 ± 3 kg; − 6.7 ± 0.6 kg) vs. NPLC (− 9.7 ± 3 kg; − 8.5 ± 0.7 kg) (ns); HPLC vs. NPLC ($p < 0.01$); HPNC vs. NPNC ($p < 0.01$). HPNC vs. all other diets reduced diastolic blood pressure more. Relationships between changes in BW, FM, FFM or metabolic parameters and energy percentage of fat in the diet were not statistically significant. Metabolic profile and fat-free-mass were improved following weight-loss.

Conclusion

Body-weight loss and weight-maintenance depends on the high-protein, but not on the 'low-carb' component of the diet, while it is unrelated to the concomitant fat-content of the diet.

Highlights

► The research unmasks the success of 'low-carb' diets for body weight management. ► Similar protein contents, similar body-weight management irrespective of carbohydrate content. ► High- vs. normal-protein diets show the favorable effects on body-weight management. ► A high-protein normal-carbohydrate diet reduces diastolic blood pressure more.

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Abbreviations

HP, high-protein; HPLC, high-protein low-carbohydrate; HPNC, high-protein normal-carbohydrate; LC, low-carbohydrate; NC, normal-carbohydrate; NP, normal protein; NPLC, normal-protein low-carbohydrate; NPNC, normal-protein normal-carbohydrate

Keywords

High-protein; Low-carb; Weight loss; Body composition

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☆☆ Clinical registration: www.clinicaltrials.gov number NCT00862953.