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The Effect of Protein and Glycemic Index on Children's Body Composition: The DiOGenes Randomized Study

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KEY WORDS

childhood adiposity, dietary intervention, DiOGenes, glycemic index, protein, randomized controlled trial

ABBREVIATIONS

HP—high protein
GI—glycemic index
LGI—low glycemic index
HGI—high glycemic index
DiOGenes—Diet, Obesity, and Genes
LCD—low-calorie diet
LP—low protein

This trial has been registered at www.clinicaltrials.gov (identifier NCT00390637).

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WHAT'S KNOWN ON THIS SUBJECT: The potential of HP and LGI diets to promote weight loss in adults has resulted in research to investigate the effect of these diets on weight control in children; results have been promising but still conflicting.

WHAT THIS STUDY ADDS: In the DiOGenes study, a European family-based, randomized, controlled, multicenter, 6-month energy ad libitum dietary intervention study, the LP/HGI diet increased body fat, whereas overweight/obesity decreased in those on the HP/LGI diet.

abstract

OBJECTIVE: To investigate the effect of protein and glycemic index (GI) on body composition among European children in the randomized, 6-month dietary intervention DiOGenes (diet, obesity, and genes) family-based study.

PATIENTS AND METHODS: In the study, 827 children (381 boys and 446 girls), aged 5 to 18 years, completed baseline examinations. Families with parents who lost ≥8% of their weight during an 8-week run-in low-calorie diet period were randomly assigned to 1 of 5 ad libitum diets: low protein (LP)/low glycemic index (LGI); LP/high GI (HGI); high protein (HP)/LGI; HP/HGI; and control diet. The target difference was 15 GI U between the LGI/HGI groups and 13 protein percentage points between the LP/HP groups. There were 658 children examined after 4 weeks. Advice on food-choice modification was provided at 6 visits during this period. No advice on weight loss was provided because the focus of the study was the ability of the diets to affect outcomes through appetite regulation. Anthropometric measurements and body composition were assessed at baseline, week 4, and week 26.

RESULTS: In the study, 465 children (58.1%) completed all assessments. The achieved differences between the GI and protein groups were 2.3 GI U and 4.9 protein percentage points, respectively. The LP/HGI group increased body fat percentage significantly more than the other groups ($P = .040$; partial $\eta^2 = 0.039$), and the percentage of overweight/obese children in the HP/LGI group decreased significantly during the intervention ($P = .031$).

CONCLUSIONS: Neither GI nor protein had an isolated effect on body composition. However, the LP/HGI combination increased body fat, whereas the HP/LGI combination was protective against obesity in this sample of children. *Pediatrics* 2010;126:e1143–e1152