

Evaluation of an amino acid mix on the secretion of gastrointestinal peptides, glucometabolic homeostasis, and appetite in obese adolescents administered with a fixed-dose or ad libitum meal.

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Proteins have been demonstrated to reduce food intake in animals and humans via peripheral and central mechanisms. Supplementation of a dietetic regimen with single or mixed amino acids might represent an approach to improve the effectiveness of any body weight reduction program in obese subjects. The aim of the present study was to evaluate the effects of an amino acid mix (L-arginine + L-leucine + L-glutamine + L-tryptophan) on the secretion of some gastrointestinal peptides (i.e., ghrelin and glucagon-like peptide type 1, GLP-1), glucometabolic homeostasis (i.e., glucose, insulin, and glucagon), and appetite (hunger/satiety scored by visual analogue scale, VAS) in obese adolescents (n = 14; 10 females and 4 males; age: 16.6 ± 1.0 years; body mass index (BMI): 36.4 ± 4.6 kg/m²; fat-free mass (FFM): $54.9 \pm 4.7\%$; fat mass (FM): $45.1 \pm 4.4\%$) administered with a fixed-dose (lunch) or ad libitum (dinner) meal. Isocaloric maltodextrins were used as control treatment. During the lunch test, a significant increase in circulating levels of GLP-1, but not of ghrelin, was observed in the amino acid-treated group, which was congruent with significant changes in appetite, i.e., increase in satiety and decrease in hunger. A significant hyperglycemia was found in the maltodextrin-treated group during the prelunch period, without any significant changes in insulin and glucagon between the two groups. During the dinner test, there were no significant differences in appetite (hunger/satiety) and intake of calories. In conclusion, L-arginine, L-leucine, L-glutamine, and L-tryptophan, when administered to obese adolescents with a fixed-dose meal, are capable of evoking an anorexigenic response, which is, at least in part, mediated by an increase in GLP-1 released in circulation by L cells, which are capable of chemosensing specific amino acids present in the intestinal lumen. Further additional studies are requested to understand whether higher doses are necessary to inhibit ad libitum feeding.

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