

Parallel Session RTD Line 3 / Diet and weight gain prevention: observation perspective

Lecture 1: Genetic and environmental influences of dietary intake

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Abstract

We estimated the contribution of genetic and environmental influences on dietary intake in a large population-based sample of healthy twins.

Data originated from a cross-sectional study of 600 male and female healthy twin-pairs with self-reported food consumption frequency by a validated questionnaire with 247 foods and recipes. Estimates of relative proportion of additive genetic, non-additive genetic, shared environmental, and unshared environmental effects on various aspects of dietary intake were obtained by quantitative genetic modeling of twin data based on linear structural equations.

The analyses demonstrated genetic influence on total energy, macronutrient energy and dietary fiber intakes, the glycemic index and the glycemic load of the foods consumed, and the dietary energy density, with significant heritability estimates ranging from 0.25 (0.11-0.38)-0.47 (0.31-0.60) in men and 0.32 (0.12-0.48)-0.49 (0.35-0.61) in women. When analyzing the dietary intake as intake of energy from 20 food-groups, the genetic and environmental influences differed between the food groups and between the genders. For some food groups (fruit in both genders, for men also poultry and eggs) no genetic influence was found whereas for other food groups (for women, juices and eggs) non-additive genetic effects were demonstrated. For a number of food groups (potatoes, vegetables, fruits, poultry, fish, margarine and candy) shared environmental influences were found.

These results provide evidence for both genetic and shared environmental effects on dietary intake. Although the remaining non-shared environmental effects include measurement errors, there appear to be considerable potential for individually modifiable effects.