

Genetic Variants in Adiponectin and Its Receptors Play an Important Role in Risks of Obesity and Insulin Resistance

Adiponectin is a hormone that is produced in adipose tissue, binds to adiponectin receptors in skeletal muscle and other tissues, and occurs in low concentrations in obese individuals and people with type 2 diabetes. Publishing in this month's American Journal of Clinical Nutrition, Loos and colleagues at the Pennington Biomedical Research Institute in Baton Rouge, LA, evaluated relations of variants of the adiponectin gene (ADIPOQ) and its receptors (ADIPOR1 and ADIPOR2) with the presence of obesity markers, which included body mass index, waist circumference, percentage body fat, and fat distribution in subcutaneous and visceral compartments, and with energy metabolism according to the respiratory quotient, which measures the relation between lipid and glucose metabolism. The subjects included 759 adults of French-Canadian ancestry who participated in the Québec Family Study, of whom about one-half were parents (mean age of 50 years) and one-half their children (mean age of 30 years). The analyses included potential effects of single gene variants and their combinations among the 3 genotypes on measures of adiposity and energy metabolism. The study found highly significant relations between a variant of the ADIPOQ gene and overall and abdominal obesity and between gene variants of ADIPOR1 and ADIPOR2 and respiratory quotient. The effects of certain combinations of genotypes of ADIPOQ and ADIPOR1 on the prevalence of abdominal adiposity were even more striking. The authors conclude that common variants in genes that regulate body fatness and the metabolism of lipid and glucose may play an important role in the incidences of obesity and type 2 diabetes. An accompanying editorial by Fislser and Warden emphasizes the evidence that multiple genetic abnormalities are associated with increased susceptibility to obesity and points out that our understanding of genetics in obesity risk will be much clearer with the development of newer methods of genetic screening of susceptible populations.

Loos RJF, Ruchat S, Rankinen T, Tremblay A, Pérusse L, Bouchard C. Adiponectin and adiponectin receptor gene variants in relation to resting metabolic rate, respiratory quotient, and adiposity-related phenotypes in the Québec Family Study. Am J Clin Nutr 2007;85:26–34.

Fislser JS, Warden CH. The current and future search for obesity genes. Am J Clin Nutr 2007;85:1–2