

Abstract

Am J Clin Nutr. 2007 Oct;86(4):1174-1178.

Fructose intake is a predictor of LDL particle size in overweight schoolchildren

Isabelle Aeberli, Michael B Zimmermann, Luciano Molinari, Roger Lehmann, Dagmar l'Allemand, Giatgen A Spinass and Kaspar Berneis

From the Human Nutrition Laboratory, Institute of Food Science and Nutrition, ETH Zurich, Zurich, Switzerland; the Clinic for Endocrinology and Diabetes, University Hospital Zurich, Zurich, Switzerland; the Children's Hospital of Eastern Switzerland, St Gallen, Switzerland; and the Child Development Center, University Children's Hospital, Zurich, Switzerland

BACKGROUND: High amounts of dietary fructose may contribute to dyslipidemia in adults, but there are few data in children. Childhood adiposity is associated with smaller LDL particle size, but the dietary predictors of LDL size in overweight children have not been studied.

OBJECTIVES: We aimed to determine whether LDL particle size is associated with dietary factors and specifically with fructose intake in normal-weight and overweight children.

DESIGN: In a cross-sectional study of normal-weight and overweight 6–14 y-old Swiss children (n = 74), dietary intakes were assessed by using two 24-h-recalls and a 1-d dietary record. Body mass index (BMI) and waist-hip ratio (WHR) were measured, and plasma lipid profile and LDL particle size were determined.

RESULTS: Compared with the normal-weight group, overweight children had significantly higher plasma triacylglycerol concentrations, lower HDL-cholesterol concentrations, and smaller LDL particle size ($P < 0.05$). LDL particle size was inversely correlated to BMI SD scores and WHR ($P = 0.007$). Although there were no significant differences in total fructose intake, the overweight children consumed a significantly ($P < 0.05$) higher percentage of fructose from sweets and sweetened drinks than did the normal-weight children. After control for adiposity, the only dietary factor that was a significant predictor of LDL particle size was total fructose intake ($P = 0.024$).

CONCLUSIONS: In school-age children, greater total and central adiposity are associated with smaller LDL particle size and lower HDL cholesterol. Overweight children consume more fructose from sweets and sweetened drinks than do normal-weight children, and higher fructose intake predicts smaller LDL particle size.