

Abstract

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Omega-3 polyunsaturated fatty acid intake and islet autoimmunity in children at increased risk for type 1 diabetes.

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CONTEXT: Cod liver oil supplements in infancy have been associated with a decreased risk of type 1 diabetes mellitus in a retrospective study.

OBJECTIVE: To examine whether intakes of omega-3 and omega-6 fatty acids are associated with the development of islet autoimmunity (IA) in children.

DESIGN, SETTING, AND PARTICIPANTS: A longitudinal, observational study, the Diabetes Autoimmunity Study in the Young (DAISY), conducted in Denver, Colorado, between January 1994 and November 2006, of 1770 children at increased risk for type 1 diabetes, defined as either possession of a high diabetes risk HLA genotype or having a sibling or parent with type 1 diabetes. The mean age at follow-up was 6.2 years. Islet autoimmunity was assessed in association with reported dietary intake of polyunsaturated fatty acids starting at age 1 year. A case-cohort study (N = 244) was also conducted in which risk of IA by polyunsaturated fatty acid content of erythrocyte membranes (as a percentage of total lipids) was examined.

MAIN OUTCOME MEASURE: Risk of IA, defined as being positive for insulin, glutamic acid decarboxylase, or insulinoma-associated antigen-2 autoantibodies on 2 consecutive visits and still autoantibody positive or having diabetes at last follow-up visit.

RESULTS: Fifty-eight children developed IA. Adjusting for HLA genotype, family history of type 1 diabetes, caloric intake, and omega-6 fatty acid intake, omega-3 fatty acid intake was inversely associated with risk of IA (hazard ratio [HR], 0.45; 95% confidence interval [CI], 0.21-0.96; P = .04). The association was strengthened when the definition of the outcome was limited to those positive for 2 or more autoantibodies (HR, 0.23; 95% CI, 0.09-0.58; P = .002). In the case-cohort study, omega-3 fatty acid content of erythrocyte membranes was also inversely associated with IA risk (HR, 0.63; 95% CI, 0.41-0.96; P = .03).

CONCLUSION: Dietary intake of omega-3 fatty acids is associated with reduced risk of IA in children at increased genetic risk for type 1 diabetes.

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