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Serum Omega-3 Polyunsaturated Fatty Acids and Risk of Incident Type 2 Diabetes in Men: The Kuopio Ischaemic Heart Disease Risk Factor Study.

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Abstract

Objective: The relationship between fish or omega-3 polyunsaturated fatty acids (PUFA) and type 2 diabetes is inconclusive. Even contaminants in fish, such as mercury, may modify the effects. We investigated the associations between serum omega-3 PUFAs eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA), docosahexaenoic acid (DHA) and alpha-linolenic acid (ALA), hair mercury and risk of incident type 2 diabetes in middle-aged and older Finnish men.Research Design and Methods: A total of 2212 men from the prospective, population-based Kuopio IschaemicHeart Disease Risk Factor study, aged 42-60 years and free of type 2 diabetes at baseline in 1984-1989, were investigated. Serum PUFA and hair mercury were used as biomarkers for exposure. Dietary intakes were assessed with 4-day food recording. Type 2 diabetes was assessed by self-administered questionnaires, fasting and 2-h oral glucose tolerance test blood glucose measurement at re-examination rounds 4, 11 and 20 years after the baseline, and by record linkage to hospital discharge registry and reimbursement register on diabetes medication expenses. Cox proportional hazards models were used to analyze associations.Results: During the average follow-up of 19.3 years, 422 men developed type 2diabetes. Men in the highest vs. the lowest serum EPA+DPA+DHA quartile had 33% lower multivariate-adjusted risk for type 2 diabetes (95% CI 13-49%, P-trend 0.01). No statistically significant associations were observed with serum or dietary ALA, dietary fish or EPA+DHA, or hair mercury.Conclusions: Serum long-chain omega-3 PUFA concentration, an objective biomarker for fish intake, was associated with long-term lower risk of type 2 diabetes.