

Diabetes mellitus and serum carotenoids: findings from the Third National Health and Nutrition Examination Survey.

Ford ES, Will JC, Bowman BA, Narayan KM

Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA.

Little is known about carotenoids, a diverse group of plant compounds with antioxidant activity, and their association with diabetes, a condition characterized by oxidative stress. Data from phase I of the Third National Health and Nutrition Examination Survey (1988-1991) were used to examine concentrations of alpha-carotene, beta-carotene, cryptoxanthin, lutein/zeaxanthin, and lycopene in 40- to 74-year-old persons with a normal glucose tolerance (n = 1,010), impaired glucose tolerance (n = 277), newly diagnosed diabetes (n = 148), and previously diagnosed diabetes (n = 230) based on World Health Organization criteria. After adjustment for age, sex, race, education, serum cotinine, serum cholesterol, body mass index, physical activity, alcohol consumption, vitamin use, and carotene and energy intake, geometric means of beta-carotene were 0.363, 0.316, and 0.290 micromol/liter for persons with a normal glucose tolerance, impaired glucose tolerance, and newly diagnosed diabetes, respectively (p = 0.004 for linear trend), and geometric means for serum lycopene were 0.277, 0.259, and 0.231 micromol/liter, respectively (p = 0.044 for linear trend). All serum carotenoids were inversely related to fasting serum insulin after adjustment for confounders (p < 0.05 for each carotenoid). If confirmed, these data suggest new opportunities for research that include exploring a possible role for carotenoids in the pathogenesis of insulin resistance and diabetes.

Am J Epidemiol. 1999 Jan 15;149(2):168-76