Abstract

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Associations of plasma carotenoids with risk factors and biomarkers related to cardiovascular disease in middle-aged and older women.

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BACKGROUND: Cardiovascular disease (CVD) risk factors may potentially influence plasma concentrations of carotenoids. However, data on the association of plasma carotenoids with CVD related biomarkers are only limited.

OBJECTIVE: We examined the cross-sectional association of plasma carotenoids with blood lipids, glycated hemoglobin (Hb A(1c)), and C-reactive protein (CRP) in middle-aged and older women initially free of CVD and cancer.

DESIGN: Participants from 3 nested case-control studies in the Women's Health Study were pooled. Baseline plasma carotenoids, including alpha-carotene, beta-carotene, beta-cryptoxanthin, lycopene, and lutein-zeaxanthin, blood lipids, Hb A(1c), and CRP were available for 2895 women.

RESULTS: Women who were current smokers or obese had lower plasma concentrations of most carotenoids expect for lycopene. After adjusting for age, race, lifestyle factors, clinical factors, plasma total cholesterol, and dietary carotenoids, an increase of 30 mg/dL in LDL cholesterol was associated with a 17% increase in alpha-carotene, a 16% increase in beta-carotene, and an 8.5% increase in lycopene; an increase of 10 mg/dL in HDL cholesterol was associated with a 5.3% decrease in lycopene; an increase of 0.3% in Hb A(1c) was associated with a 1.4% increase in lycopene; and an increase of 2 mg/L in CRP was associated with a 1.3% decrease in beta-carotene (all $P < 0.01$).

CONCLUSIONS: In middle-aged and older women free of CVD and cancer, plasma carotenoids were associated with smoking, obesity, LDL cholesterol, HDL cholesterol, Hb A(1c), and CRP. The associations differ among individual carotenoids, possibly reflecting metabolic effects of lifestyle and physiologic factors on plasma carotenoids, and may partially explain the inverse association of plasma carotenoids with CVD outcomes observed in epidemiologic studies.

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