Abstract


Carotenoid intakes and risk of breast cancer defined by estrogen receptor and progesterone receptor status: a pooled analysis of 18 prospective cohort studies.


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BACKGROUND: Epidemiologic studies examining associations between carotenoid intakes and risk of breast cancer by estrogen receptor (ER) and progesterone receptor (PR) status are limited.

OBJECTIVE: We investigated these associations in a pooled analysis of 18 cohort studies.

DESIGN: Of 1,028,438 participants followed for a maximum follow-up of 26 y across studies, 33,380 incident invasive breast cancers were identified. Study-specific RRs and 95% CIs were estimated by using Cox proportional hazards regression and then pooled by using a random-effects model.

RESULTS: α-Carotene, β-carotene, and lutein/zeaxanthin intakes were inversely associated with the risk of ER-negative (ER-) breast cancer (pooled multivariable RRs of the comparison between the highest and lowest quintiles): α-carotene (0.87; 95% CI: 0.78, 0.97), β-carotene (0.84; 95% CI: 0.77, 0.93), and lutein/zeaxanthin (0.87; 95% CI: 0.79, 0.95). These variables were not inversely associated with the risk of ER-positive (ER+) breast cancer (pooled multivariable RRs for the same comparison): α-carotene (1.04; 95% CI: 0.99, 1.09), β-carotene (1.04; 95% CI: 0.98, 1.10), and lutein/zeaxanthin (1.00; 95% CI: 0.93, 1.07). Although the pooled RRs for quintile 5 for β-cryptoxanthin were not significant, inverse trends were observed for ER- and ER+ breast cancer (P-trend ≤ 0.05). Nonsignificant associations were observed for lycopene intake. The associations were largely not appreciably modified by several breast cancer risk factors. Nonsignificant associations were observed for PR-positive and PR-negative breast cancer.

CONCLUSIONS: Intakes of α-carotene, β-carotene, and lutein/zeaxanthin were inversely associated with risk of ER-, but not ER+, breast cancer. However, the results need to be interpreted with caution because it is unclear whether the observed association is real or due to other constituents in the same food sources.

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