Abstract


Plasma Riboflavin and Vitamin B-6, but Not Homocysteine, Folate, or Vitamin B-12, Are Inversely Associated with Breast Cancer Risk in the European Prospective Investigation into Cancer and Nutrition-Varese Cohort.


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BACKGROUND: One-carbon metabolism-important for DNA stability and integrity-may play a role in breast carcinogenesis. However, epidemiologic studies addressing this issue have yielded inconsistent results.

OBJECTIVE: We prospectively investigated associations between breast cancer and plasma folate, riboflavin, vitamin B-6, vitamin B-12, and homocysteine in women recruited to the Varese (Italy) cohort of the EPIC (European Prospective Investigation into Cancer and Nutrition) study.

METHODS: We performed a nested case-control study on women aged 35-65 y at recruitment with a median body mass index of 25.3 kg/m(2) who gave blood samples in 1987-1992 and again in 1993-1998. Breast cancer cases identified by 31 December 2009 were individually matched to controls. RRs of breast cancer (and subtypes defined by hormone receptor status) with 95% CIs were estimated by unconditional logistic regression, controlling for matching factors and breast cancer risk factors.

RESULTS: After a median of 14.9 y, 276 breast cancer cases were identified and matched to 276 controls. Increasing plasma vitamin B-6 was associated with decreased risk of overall (RR: 0.78; 95% CI: 0.63, 0.96 for 1-SD increase), premenopausal (RR: 0.66; 95% CI: 0.48, 0.92 for 1-SD increase), estrogen receptor-positive (RR: 0.79; 95% CI: 0.63, 1.00 for 1-SD increase), and progesterone receptor-positive (RR: 0.72; 95% CI: 0.55, 0.95 for 1-SD increase) breast cancers. Increased plasma vitamin B-6 was also associated with decreased breast cancer risk in alcohol consumers (≥7 g/d) compared with consumption of <7 g/d or nonconsumption (RR: 0.71; 95% CI: 0.51, 0.99). High plasma riboflavin was associated with significantly lower risk in premenopausal women (RR: 0.45; 95% CI: 0.21, 0.94; highest compared with the lowest quartile, P trend = 0.021). Plasma homocysteine, folate, and vitamin B-12 were not associated with breast cancer risk.

CONCLUSIONS: High plasma vitamin B-6 and riboflavin may lower breast cancer risk, especially in premenopausal women. Additional research is necessary to further explore these associations.

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