

Abstract

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Plasma antioxidant concentration, not superoxide dismutase polymorphism, is associated with breast cancer risk in Korean women.

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OBJECTIVE: Disturbances in redox regulation are suggested to be involved in the development of breast cancer. We conducted a hospital-based case-control study to examine the hypothesis that lower plasma antioxidant concentration is related to higher risk of breast cancer and that genetic polymorphism of manganese superoxide dismutase (SOD2) modifies the relationship between breast cancer risk and plasma antioxidant.

METHODS: Genotyping for SOD2 Val16Ala polymorphism was performed by a 5' exonuclease assay, and plasma concentrations of retinol, carotenoids, and tocopherols were determined by high-performance liquid chromatography. Unconditional logistic regression models were used to estimate crude and multivariate odds ratios with a 95% confidence interval.

RESULTS: The variant allele frequencies of SOD2 Val16Ala (TC or CC type) were 26% for the control subjects and 23% for the breast cancer patients, and the variant genotype was not a risk factor for breast cancer. Higher plasma retinol concentration was associated with a lower risk, whereas higher plasma β -carotene, α -tocopherol, or γ -tocopherol concentrations were associated with a higher risk of breast cancer. SOD2 CT or CC genotype was associated with lower risk (odds ratio, 0.53; 95% confidence interval, 0.30-0.93; P for interaction = .025) in subjects with low plasma γ -tocopherol concentration.

CONCLUSIONS: Our findings suggest that the SOD2 Val16Ala variant is not related to the risk of breast cancer in Korean women; however, it may affect the association between plasma γ -tocopherol levels and the risk of breast cancer.

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