Epidemiological Studies of Vitamin D and Breast Cancer

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Epidemiologic evidence bearing on the relationship between vitamin D and breast cancer risk has come from several sources. Ecologic studies have shown inverse associations between sunlight/solar radiation exposure and breast cancer incidence/mortality, but the limitations of these studies are well known. Several studies of vitamin D intake and breast density have shown inverse associations but these and the one null study were cross-sectional, which limits the inferences that can be drawn. Studies of VDR polymorphisms in relation to breast cancer risk have been inconsistent, perhaps reflecting study design issues and intrinsic population differences (i.e., between-population differences in the extent of linkage disequilibrium). Of the four studies to date of circulating levels of vitamin D and breast cancer, the two case-control studies showed inverse associations whereas the two nested case-control studies showed either no association or a weak, statistically non-significant inverse association.

The results of the retrospective studies may have been influenced by the effects of breast cancer on circulating vitamin D levels. Several studies have focused on the role of vitamin D and/or sunlight exposure in the etiology of breast cancer. Case-control studies have mostly yielded null results, while three cohort studies of vitamin D intake in adulthood and breast cancer risk provided some evidence for inverse associations, either for vitamin D intake alone or for vitamin D in combination with sunlight exposure. Overall, despite abundant experimental evidence for an inverse association between vitamin D and breast cancer risk, the available epidemiologic evidence provides, at best, limited support for such an association.