
Letter

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In the July 1996 issue of Cancer Epidemiology, Biomarkers & Prevention, Shannon et al. describe a surprising inverse association between water consumption and risk of colon cancer. Despite no effect of total nonalcoholic beverage (i.e., water, coffee, decaffeinated coffee, tea, diet soft drinks, regular soft drinks, orange juice, and other fruit drinks or juices) consumption, water drinking decreased the risk of colon cancer by 45% (OR, 0.55; 95% CI, 0.31–0.99) among women and 32% (OR, 0.68; 95% CI, 0.38–1.22) among men. The purpose of this study was to explore for associations between adenocarcinoma of the colon and food groupings. In light of these findings, we report the results of a pilot study of water drinking and breast cancer risk.

A small, hospital-based, case-control study was undertaken to investigate the hypothesis that water drinking protects against breast cancer. Although some studies have shown a positive association between diuretic beverage consumption and breast cancer risk, water drinking has not been examined (2–4). Incident cases (n = 44) were recruited sequentially between May and August 1995 from the only two hospitals that surgically treat breast cancer in the city of Sheffield, United Kingdom. Cases were women with newly diagnosed, histologically confirmed breast cancer. Controls (n = 55) with non-neoplastic conditions and no history of malignancy were drawn from the same hospitals covering six surgical categories. No matching was carried out. The mean (SD) ages of the cases and controls were 56.5 (9.4) and 54.9 (11.6) years, respectively. The study procedure involved dietary assessment using the diet history method and administration of a short questionnaire to assess exposure to known breast cancer risk factors. The diet history comprised a detailed interview (carried out by one researcher), which required subjects to describe food and beverage consumption over a typical 7-day period in the year prior to hospital admission. Particular emphasis was placed on beverage consumption. Daily energy and nutrient intakes were estimated using published food portion sizes and FOODBASE dietary software. Subjects were classified as water drinkers if they reported drinking any water during the typical 7-day period referred to in the interview.

In logistic regression analyses, water drinking appeared strongly, inversely, and significantly associated with breast cancer risk. The unadjusted OR for water drinking was 0.31 (95% CI, 0.13–0.72). Adjusted for age, the risk estimate remained unchanged (OR, 0.31; 95% CI, 0.13–0.72). Adjusted for age; height; exercise; family history; hormone replacement therapy use; endogenous estrogen exposure; oral contraceptive or birth control pill use; and tea, coffee, and alcohol consumption, the effect of water drinking on breast cancer risk was 0.21 (95% CI, 0.07–0.62). This risk estimate represented a 4.7-fold difference in the odds of exposure between cases and controls.

Energy and nutrient intakes were not included in the models, because they were not associated with both the exposure and outcome in this dataset.

Although the small sample size prohibited stratified analysis and/or inclusion of interaction terms in the multivariate models, the association appeared to be modified by menopausal status. The crude stratum-specific risk estimates for pre- and postmenopausal women were OR of 0.67 (95% CI, 0.17–2.69; n = 35) and OR of 0.21 (95% CI, 0.07–0.62; n = 64), respectively. A larger study with the power to simultaneously account for confounding and interaction terms is needed to confirm these results.

Despite the small sample size, these preliminary results seem to parallel those described by Shannon et al. (1). Water drinking appeared to confer a beneficial effect on cancer risk. Shannon et al. suggest that water intake may reduce colon cancer risk by decreasing bowel transit time and reducing mucosal contact with carcinogens. We believe that water intake may also play a role in limiting carcinogenesis via other water requirement-related mechanisms. Subclinical or "chronic" dehydration may compromise intracellular water, alter cellular concentrations, affect the activity of enzymes in metabolic regulation, and inhibit cellular carcinogen removal (5, 6). If water requirement-dependent mechanisms are important in carcinogenesis, combining water and diuretic beverage consumption could reduce observable effects, a possible explanation for the lack of effect of total beverage consumption in the Shannon et al. study.

A potential interaction between water requirements and reproductive hormone metabolism also deserves attention. Estrogen and progesterone levels have been shown to affect thirst, urine osmolality, and the threshold for the secretion of antidiuretic hormone (7–11). Sex and age differences in hormone-mediated water requirements may explain the stronger effect of water consumption observed for women by Shannon et al. (1), as well as that observed for postmenopausal women in this pilot study.

Water intake as a risk factor for breast and colon cancer merits further study.

References


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