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Intake of Carotenoids and Retino in Relation to Risk of Prostate Cancer

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Background:

Several human studies have observed a direct association between retinol (vitamin A) intake and risk of prostate cancer; other studies have found either an inverse association or no association of intake of β-carotene (the major provitamin A) with risk of prostate cancer. Data regarding carotenoids other than β-carotene in relation to prostate cancer risk are sparse. *Purpose*: We conducted a prospective cohort study to examine the relationship between the intake of various carotenoids, retinol, fruits, and vegetables and the risk of prostate cancer. *Methods*: Using responses to a validated, semiquantitative food-frequency questionnaire mailed to participants in the Health Professionals Follow-up Study in 1986, we assessed dietary intake for a 1-year period for a cohort of 47 894 eligible subjects initially free of diagnosed cancer. Follow-up questionnaires were sent to the entire cohort in 1988, 1990, and 1992. We calculated the relative risk (RR) for each of the upper categories of intake of a specific food or nutrient by dividing the incidence rate of prostate cancer among men in each of these categories by the rate among men in the lowest intake level. All P values resulted from two-sided tests. *Results*: Between 1986 and 1992, 812 new cases of prostate cancer, including 773 non-stage A1 cases, were documented. Intakes of the carotenoids β-carotene, α-carotene, lutein, and β-cryp-toxanthin were not associated with risk of non-stage A1 prostate cancer; only lycopene intake was related to lower risk (age- and energy-adjusted RR = 0.79; 95% confidence interval [CI] = 0.64–0.99 for high versus low quintile of intake; P for trend =.04). Of 46 vegetables and fruits or related products, four were significantly associated with lower prostate cancer risk; of the four— tomato sauce (P for trend =.001), tomatoes (P for trend =.03), and pizza (P for trend =.05), but not strawberries— were primary sources of lycopene. Combined intake of tomatoes, tomato sauce, tomato juice, and pizza (which accounted for 82% of lycopene intake) was inversely associated with risk of prostate cancer (multivariate RR = 0.65; 95% CI = 0.44–0.95, for consumption frequency greater than 10 versus less than 1.5 servings per week; P for trend =.01) and advanced (stages C and D) prostate cancers (multivariate RR = 0.47; 95% CI = 0.22–1.00; P for trend =.03). No consistent association was observed for dietary retinol and risk of prostate cancer. *Conclusions*: These findings suggest that intake of lycopene or other compounds in tomatoes may reduce prostate cancer risk, but other measured carotenoids are unrelated to risk. *Implications*: Our findings support recommendations to increase vegetable and fruit consumption to reduce cancer incidence but suggest that tomato-based foods may be especially beneficial regarding prostate cancer risk.