

Red wine consumption and risk of prostate cancer: the California men's health study

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Red wine contains polyphenol antioxidants that inhibit prostate cancer development in animal studies. We investigated the effect of red wine intake on the risk of prostate cancer using data prospectively collected in the California Men's Health Study (CMHS). CMHS is a multiethnic cohort of 84,170 men aged 45–69 years who were members of the Kaiser Permanente Southern and Northern California Health Plans. Information on demographic and lifestyle factors was collected using mailed questionnaires between 2002 and 2003. We used Cox models to estimate the effect of red wine on prostate cancer risk, adjusting for potential confounders. A total of 1,340 incident prostate cancer cases identified from Surveillance, Epidemiology and End Result-affiliated cancer registries were included in the analyses. We did not find a clear association between red wine intake and risk of prostate cancer. Hazard ratio (HR) estimates for consuming <1 drink/week, ≥1 drink/week but <1 drink/day and ≥1 drink/day were 0.89, 95% confidence interval (0.74–1.07), 0.99 (0.83–1.17) and 0.88 (0.70–1.12), respectively. Further, we observed no linear dose response. The lack of association for red wine intake was consistently observed when we restricted the analyses to those with and without a history of PSA screening. In addition, we also did not observe any association with prostate cancer for beer, white wine, liquor or combined alcoholic beverage intake (HR for combined alcoholic beverage intake of ≥5 drinks/day = 1.16 (0.83–1.63)). Neither red wine nor total alcohol consumption were associated with prostate cancer risk in this population of moderate drinkers.

Red wine is a rich source of polyphenol antioxidants such as resveratrol. Recently, resveratrol has received considerable attention because of its potent anti-cancer properties.^{1,2} Resveratrol inhibits cancer cell growth in many cell lines, including cancers of the lung, prostate, colon, breast and ovaries.^{3–14} Resveratrol also reduces tumor incidence in animal models by interfering with carcinogenesis through a wide array of anti-cancer actions. Several animal studies have demonstrated the ability of resveratrol to inhibit prostate cancer development by downregulating androgen receptors, inducing apoptosis/cell cycle arrest and inhibiting disease progression.^{15–20}

Key words: prostate cancer, red wine, alcohol, alcoholic beverage

Abbreviations: BMI: body mass index; BPH: benign prostate hyperplasia; CMHS: California men's health study; HR: hazard ratio; KP: Kaiser Permanente; NCI: National Cancer Institute; PSA: prostate-specific antigen; SEER: surveillance: epidemiology, and end results; STIs: sexually transmitted infections

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Despite the large number of epidemiologic studies that have evaluated the association between alcohol consumption and risk of prostate cancer, the association between red wine intake and prostate cancer has not been clearly established. This is because most prior studies did not separately examine the effect of red wine from white wine. Although both types of wine contains similar amount of alcohol, the concentration of polyphenols is higher in red wine than in white wine.^{21–23} Furthermore, because resveratrol is mostly found in grape skin, only red wine contains considerable amount of these compounds. The few studies that examined the association between red wine intake and risk of prostate cancer reported mixed results.^{24–27} Given the disease burden of prostate cancer in the United States,²⁸ the potential beneficial effect of moderate red wine intake on this cancer warrants further examination.

In this study, we investigated the hypothesis that moderate red wine consumption reduces risk of prostate cancer. We used data prospectively collected from the California Men's Health Study (CMHS), a cohort study of middle aged men who were members of Kaiser Permanente (KP) Southern and Northern California Health Plans. The CMHS was specifically designed to study prostate cancer etiology and collected comprehensive information on known risk factors of this disease.

Material and Methods

Study cohort

CMHS is a multiethnic cohort of men who are members of the southern and northern California regions of KP, the