

ARTICLES

Moderate Alcohol Intake and Cancer Incidence in Women

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on behalf of the Million Women Study Collaborators

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Background: With the exception of breast cancer, little is known about the effect of moderate intakes of alcohol, or of particular types of alcohol, on cancer risk in women.

Methods: A total of 1 280 296 middle-aged women in the United Kingdom enrolled in the Million Women Study were routinely followed for incident cancer. Cox regression models were used to calculate adjusted relative risks and 95% confidence intervals (CIs) for 21 site-specific cancers according to amount and type of alcoholic beverage consumed. All statistical tests were two-sided.

Results: A quarter of the cohort reported drinking no alcohol; 98% of drinkers consumed fewer than 21 drinks per week, with drinkers consuming an average of 10 g alcohol (1 drink) per day. During an average 7.2 years of follow-up per woman 68 775 invasive cancers occurred. Increasing alcohol consumption was associated with increased risks of cancers of the oral cavity and pharynx (increase per 10 g/d = 29%, 95% CI = 14% to 45%, $P_{\text{trend}} < .001$), esophagus (22%, 95% CI = 8% to 38%, $P_{\text{trend}} = .002$), larynx (44%, 95% CI = 10% to 88%, $P_{\text{trend}} = .008$), rectum (10%, 95% CI = 2% to 18%, $P_{\text{trend}} = .02$), liver (24%, 95% CI = 2% to 51%, $P_{\text{trend}} = .03$), breast (12%, 95% CI = 9% to 14%, $P_{\text{trend}} < .001$), and total cancer (6%, 95% CI = 4% to 7%, $P_{\text{trend}} < .001$). The trends were similar in women who drank wine exclusively and other consumers of

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alcohol. For cancers of the upper aerodigestive tract, the alcohol-associated risk was confined to current smokers, with little or no effect of alcohol among never and past smokers ($P_{\text{heterogeneity}} < .001$). Increasing levels of alcohol consumption were associated with a decreased risk of thyroid cancer ($P_{\text{trend}} = .005$), non-Hodgkin lymphoma ($P_{\text{trend}} = .001$), and renal cell carcinoma ($P_{\text{trend}} = .03$).

Conclusions: Low to moderate alcohol consumption in women increases the risk of certain cancers. For every additional drink regularly consumed per day, the increase in incidence up to age 75 years per 1000 for women in developed countries is estimated to be about 11 for breast cancer, 1 for cancers of the oral cavity and pharynx, 1 for cancer of the rectum, and 0.7 each for cancers of the esophagus, larynx and liver, giving a total excess of about 15 cancers per 1000 women up to age 75.

Context and Caveats

Prior knowledge

With the exception of breast cancer, there was little information on the cancer risks conferred by alcohol consumption in women.

Study design

Prospective cohort study with alcohol consumption determined on the basis of a questionnaire and information on incidence of specific cancers obtained from a national registry. Cox regression models were used to estimate cancer risks associated with alcohol consumption after adjustment for other risk factors.

Contribution

Increasing but moderate alcohol consumption in women was determined to be associated with an increased risk of cancers of the oral cavity and pharynx, esophagus, larynx, rectum, breast, and liver, and with a decreased risk for thyroid cancer, non-Hodgkin lymphoma, and renal cell carcinoma. No differences in cancer risks were observed between drinkers of wine only and other consumers of alcohol.

Implications

In middle-aged women, moderate alcohol consumption increases the risk of cancer overall; each additional drink regularly consumed per day may account for approximately 15 excess cancers per 1000 women up to age 75 in this age group in developed countries.

Limitations

The study could not address the risk conferred by heavy sustained drinking due to the composition of the cohort.

From the Editors

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Million Women Study Shows Even Moderate Alcohol Consumption Associated with Increased Cancer Risk

Low to moderate alcohol consumption among women is associated with a statistically significant increase in cancer risk and may account for nearly 13 percent of the cancers of the breast, liver, rectum, and upper aero-digestive tract combined, according to a report in the February 24 online issue of the *Journal of the National Cancer Institute*.

With the exception of breast cancer, little has been known about the impact of low to moderate alcohol consumption on cancer risk in women.

To determine the impact of alcohol on overall and site-specific cancer risk, Naomi Allen, D.Phil., of the University of Oxford, U.K., and colleagues examined the association of alcohol consumption and cancer incidence in the Million Women Study, which included 1,280,296 middle-aged women in the United Kingdom. Participants were recruited to the study between 1996 and 2001. Researchers identified cancer cases through the National Health Service Central Registries.

Women in the study who drank alcohol consumed, on average, one drink per day, which is typical in most high-income countries such as the U.K. and the U.S. Very few drank three or more drinks per day. With an average follow-up time of more than 7 years, 68,775 women were diagnosed with cancer.

The risk of any type of cancer increased with increasing alcohol consumption, as did the risk of some specific types of cancer, including cancer of the breast, rectum, and liver. Women who also smoked had an increased risk of cancers of the oral cavity and pharynx, esophagus, and larynx. The type of alcohol consumed – wine versus spirits or other types – did not alter the association between alcohol consumption and cancer risk.

Each additional alcoholic drink regularly consumed per day was associated with 11 additional breast cancers per 1000 women up to age 75; one additional cancer of the oral cavity and pharynx; one additional cancer of the rectum; and an increase of 0.7 each for esophageal, laryngeal, and liver cancers. For these cancers combined, there was an excess of about 15 cancers per 1000 women per drink per day. (The background incidence for these cancers was estimated to be 118 per 1000 women in developed countries.)

“Although the magnitude of the excess absolute risk associated with one additional drink per day may appear small for some cancer sites, the high prevalence of moderate alcohol drinking among women in many populations means that the proportion of cancers attributable to alcohol is an important public health issue,” the authors write.

In an accompanying editorial, Michael Lauer M.D., and Paul Sorlie, Ph.D., of the National Heart, Lung, and Blood Institute, in Bethesda, M.D., emphasize that these new results derived from such a large study population should give readers pause. Although previous epidemiological studies have suggested that there is a cardiovascular benefit associated with moderate alcohol consumption, the excess cancer risk identified in the current study may outweigh that benefit. “From a standpoint of cancer risk, the message of this report could not be clearer. There is no level of alcohol consumption that can be considered safe,” the editorialists write.

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Citations:

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- Editorial: Alcohol, Cardiovascular Disease, and Cancer: Treat With Caution. *J Natl Cancer Inst* 2009;101:282–283