

AMERICAN THYROID ASSOCIATION

Smoking May Decrease the Incidence of Thyroid Cancer in Postmenopausal Women

Jerome M. Hershman

Kabat GC, Kim MY, Wactawski-Wende J, Rohan TE. Smoking and alcohol consumption in relation to risk of thyroid cancer in postmenopausal women. Cancer Epidemiol 2012;36:335-40. Epub April 22, 2012; doi: 10.1016/j.canep.2012.03.013.

SUMMARY • • • • • • • •

Background

Thyroid cancer is the eighth most common cancer in women, and its incidence is increasing. No risk factors other than ionizing radiation have been identified for differentiated thyroid cancer. Studies of the relationship of thyroid cancer with cigarette smoking have been contradictory. Most studies of alcohol consumption have found no association with thyroid cancer. The current study is an analysis of the association of smoking and alcohol consumption in the Women's Health Initiative (WHI), a large multicenter study designed to advance the understanding of causes of major chronic diseases in postmenopausal women.

Methods

The study assessed the association of smoking and alcohol intake with risk of thyroid cancer in a cohort of 159,340 women enrolled in the WHI. A self-administered questionnaire recorded smoking habits with regard to ever smoking, age at starting, whether a current smoker, age at quitting, and number of cigarettes smoked per day. The number of alcoholic drinks per month, week, and day were also recorded. Cox proportional-hazards models were used to estimate hazard ratios (HRs) and 95% confidence intervals for the associations of smoking and alcohol intake with risk of thyroid cancer. Tests were also performed for the interaction of alcohol intake and smoking and thyroid cancer risk.

Results

There were 331 cases of thyroid cancer, of which 276 were papillary thyroid cancers (PTCs). At baseline, patients with thyroid cancer were significantly younger (61.9 vs. 63.2 years) and taller (163.3 vs. 161.8 cm), had lower alcohol intake, and had a much greater frequency of thyroid nodules and goiter than patients who did not have cancer. Women who had smoked for <20 years were at elevated risk for thyroid cancer (HR, 1.35; 95% CI, 1.05 to 1.74). Smokers of >40 pack-years had a significantly reduced risk of PTC based on 8 exposed cancer cases (vs. 12,300 smokers who did not have cancer) (HR, 0.44; 95% CI, 0.21 to 0.89). Current smokers (11,200) had a reduced risk for PTC (HR, 0.34; 95% CI, 0.15 to 0.78), but there were only 6 patients with PTC for comparison.

Alcohol consumption was not associated with an altered risk of thyroid cancer, nor was the amount of alcohol associated with the risk of thyroid cancer. There was no interaction between smoking and drinking on the risk of thyroid cancer.

Conclusions

"Our findings suggest that current smoking and having higher pack-years of exposure are associated with a modestly reduced risk of thyroid cancer, whereas alcohol consumption does not appear to affect risk."

continued on next page

ANALYSIS AND COMMENTARY • • • • •

For people who are prejudiced against smoking, as I am, these results are disquieting. In November 2012 the Chancellor of UCLA announced that UCLA will become a tobacco-free campus starting April 2013, and I welcomed this plan. The authors reference five studies that showed an inverse association of thyroid cancer and smoking, mainly case–control studies, so their finding is not novel. How can the findings be explained? Smoking is associated with reduced serum TSH levels based on an analysis of the third National Health and Nutrition Examination (NHANES III) data (1). Smokers had a reduced frequency of elevated serum TSH, and within the normal range of serum TSH, smokers had a twofold increase in the incidence of low-normal TSH (0.1 to 0.4 mU/L) as compared with nonsmokers. Abundant data exist showing that higher serum TSH is associated with increased frequency of malignancy in patients with thyroid nodules (2). Could TSH suppression by smoking prevent the development of cancer in thyroid cells that harbor oncogenic mutations?

Another possibility is that the broad array of cancers and vascular diseases induced by smoking causes deaths and, in a sense, prevents the development of other diseases, such as thyroid cancer.

Because of the very large number of subjects in the WHI, trivial differences become significant, such as the taller height and younger age of the patients with thyroid cancer. One major limitation is that the data from this study apply only to postmenopausal women.

References

- Belin RM, Astor BC, Powe NR, Ladenson PW. Smoke exposure is associated with a lower prevalence of serum thyroid autoantibodies and thyrotropin concentration elevation and a higher prevalence of mild thyrotropin concentration suppression in the third National Health and Nutrition Examination Survey (NHANES III). J Clin Endocrinol Metab 2004;89:6077-86.
- McLeod DS, Watters KF, Carpenter AD, Ladenson PW, Cooper DS, Ding EL. Thyrotropin and thyroid cancer diagnosis: a systematic review and doseresponse meta-analysis. J Clin Endocrinol Metab 2012;97:2682-92. Epub May 23, 2012; doi: 10.1210/jc.2012-1083.