

Obesity Is Associated with Thyroid Cancer Risk in Women

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Han JM, Kim TY, Jeon MJ, Yim JH, Kim WG, Song DE, Hong SJ, Bae SJ, Kim HK, Shin MH, Shong YK, Kim WB. Obesity is a risk factor for thyroid cancer in a large, ultrasonographically screened population. Eur J Endocrinol. March 19, 2013 [Epub ahead of print].

Background

Obesity is known to be a risk factor for many cancers; it has been estimated that approximately 6% of new U.S. cancers may be attributable to obesity (1). Previous observational studies have suggested a moderate association between increased body-mass index (BMI) and differentiated thyroid cancer risk in women (2,3) or in both sexes (4-6).

Methods

This cross-sectional study examined associations between obesity and thyroid cancer. The study population included 15,068 individuals selected from the 24,935 patients who underwent routine checkups at a single medical center in Seoul, Korea, in 2007 and 2008. Individuals with incomplete data were excluded, as were those with serum TSH <0.4 mIU/L or >10 mIU/L or a history of thyroid dysfunction, thyroid nodule, thyroid surgery, or thyroid cancer. Patients with a history of thyroid cancer in firstdegree relatives were also excluded. Fasting glucose, triglyceride, insulin, and TSH measurements and height, weight, and waist circumference were ascertained in all subjects. Bioelectrical impedance was used to measure total body-fat mass, and the fat ratio was defined as the fat mass divided by the body weight. Thyroid ultrasonography was performed in all patients as part of the routine health screening, and 7472 (50%) of subjects had at least one thyroid nodule. FNA biopsies were performed on all of the 1427 patients with nodules >1 cm or with any suspicious ultrasonographic features. Of these, 269

subjects had suspicious cytopathologic findings. Following surgery, 251 patients had histologically proven papillary or follicular thyroid carcinoma, with a median tumor size of 0.6 cm; 76% of tumors were <1 cm, and 98.5% were papillary carcinomas. An additional seven patients with suspicious FNA findings who were observed without surgery, and nine who were lost to follow-up, were considered to have thyroid cancer for the purpose of analysis. Logistic-regression analyses were used to examine associations between obesity-related risk factors and thyroid cancer risk. All analyses were stratified by sex.

Results

Among women, the 140 patients with thyroid cancer were more likely to be obese (BMI, ≥ 25) than women without cancer (30% vs. 22%, P = 0.004) and had a higher mean waist circumference, fat ratio, and blood pressure. These differences were not observed in men. In logistic-regression models adjusted for age, smoking status, and serum TSH level, BMI was a significant predictor of thyroid cancer in women (odds ratio [OR], 1.63; 95% CI 1.24 to 2.10) but not in men (OR, 1.16; 95% CI, 0.85 to 1.57).

Conclusions

This is the first study to examine associations between obesity and thyroid cancer risk in a population systematically screened with ultrasound. Obesity, but not serum TSH or serum insulin, was associated with differentiated thyroid cancer risk in women. No associations with thyroid cancer risk were observed in men. *continued on next page*

ANALYSIS AND COMMENTARY • • • • • •

These data confirm previous studies demonstrating associations between obesity and thyroid cancer risk. Study strengths include the large sample size and the uniform diagnostic strategy for thyroid cancer. It is not possible to assess causality on the basis of a cross-sectional study, and the study is also limited by the use of a selected population and by assessment of a relatively small number of covariates. Importantly, most cancers in this study were papillary microcarcinomas <1 cm, and it is unclear whether results apply to cancers with greater clinical significance.

The reasons for the association between obesity and thyroid cancer risk remain poorly understood. Although no association between serum TSH and thyroid cancer was observed in this study, high serum TSH has been associated with increased thyroid cancer risk in other studies (7) and is thought to promote tumor growth. Hyperinsulinemia is thought to be mechanistically important for the development of some other types of cancer, but no association between fasting insulin levels and thyroid cancer risk was noted in this study. Adipokines and markers of inflammation and oxidative stress were not examined in this study, but are also potential mediators of the effects of obesity on oncogenesis and tumor growth.

Obesity and thyroid cancer rates are both increasing rapidly. It remains to be seen whether there is truly a causal relationship between the two. Prospective studies are needed to better define risks and to elucidate mechanisms for this relationship.

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