

Endocrine Surgery Reviews

THYROID

Trends in Thyroid Cancer Incidence and Mortality in the United States, 1974-2013.
Lim H, Devesa SS, Sosa JA, Check D, Kitahara CM.
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In Brief

The incidence of thyroid carcinoma in the US has steadily increased over the last three decades.¹ This increase has been noted over the last several decades, but has been attributed to over-diagnosis, particularly of early stage disease.² This observation prompted Lim and colleagues to evaluate trends in thyroid cancer incidence and mortality with data from the Surveillance, Epidemiology, and End Results (SEER) cancer registry.³ Using cases diagnosed during 1974-2013, they calculated annual percent changes (APC) in age-adjusted thyroid cancer incidence as well as incidence-based mortality rates, analyzing by histologic subtype and cancer stage.

Among the 77,276 patients included in the study cohort, papillary thyroid cancer was the dominant histologic subtype, contributing 64,625 cases. Over the study period 1974-2013, thyroid cancer incidence increased on average 3.6% per year, from 4.56 per 100,000 person years the first 3 years of the study period to 14.42 per 100,000 person years in the last 3 years of the study period. Thyroid cancer incidence rates increased significantly for all sex, race and age groups. Significant increases were observed in papillary thyroid cancer (APC: 4.4%), follicular thyroid cancer (APC: 0.6%), and medullary thyroid cancer (APC: 0.7%). Papillary thyroid cancer incidence increased significantly for all stages and tumor sizes.

Thyroid cancer mortality rates were available for the period 1994-2013. During this time period, incidence-based mortality increased 1.1% annually, on average, from 0.40 per 100,000 person years from 1994-1997 to 0.46 per 100,000 person years from 2010-2013. The increase was statistically significant for female, white, black and elderly (>79 years of age) patients. Papillary thyroid cancer was the only histologic subtype with a significant increase in mortality (1.7%), which was restricted to patients with advanced disease (distant metastases, stage IV disease, or both).

Lim et al conclude that the prevailing notion that increases in thyroid cancer are due to over-diagnosis is not compatible with these data, which suggest that the observed increase in incidence is accompanied by an increase in mortality, and advanced stage disease. They speculate that changes in environmental exposures may contribute to a true increase in thyroid cancer, particularly papillary thyroid carcinoma.

Critique

This important paper addresses one of the most intriguing demographic questions in thyroid cancer today - whether we are observing a true increase in the incidence of thyroid carcinoma, or whether improvements in clinical evaluation have led to an epidemic of over-diagnosis and potentially over-treatment. The use of a large, national database and analysis of the patient population by age, gender, histologic subtype and staging allow for a granular evaluation of changes over a four-decade period. The major limitation of this study is its

descriptive nature. As in all descriptive studies, this analysis is limited to observation and is not able to identify causative factors for a true increase in thyroid carcinoma. Although the authors speculate on potential environmental exposures which may contribute, positive identification remains the topic of further research.

Future Directions

Thyroid cancer has been linked to various risk factors including ionizing radiation, obesity and smoking, and links to environmental chemicals have been suggested.⁴⁻⁷ As the authors note, the more frequent use of medical imaging employing ionizing radiation, and trends toward higher rates of obesity and lower rates of smoking may contribute to the rise in thyroid cancers. However, further research to establish causal relationships as well as physiologic mechanisms of disease is needed.

References:

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3. Lim H, Devesa SS, Sosa JA, Check D, Kitahara CM. Trends in Thyroid Cancer Incidence and Mortality in the United States, 1974-2013. *Jama* 2017;317:1338-48
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Additional High Yield Reading:

1. Ito Y, Nikiforov YE, Schlumberger M, Vigneri R. Increasing incidence of thyroid cancer: controversies explored. *Nature reviews Endocrinology* 2013;9:178-84.
2. Kitahara CM, Sosa JA. The changing incidence of thyroid cancer. *Nature reviews Endocrinology* 2016;12:646-53.
3. Marcello MA, Malandrino P, Almeida JF, et al. The influence of the environment on the development of thyroid tumors: a new appraisal. *Endocrine-related cancer* 2014;21:T235-54.