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THYROID CANCER

Global long-term thyroid cancer death rate trends over the past 30 years

BACKGROUND

The number of patients diagnosed with thyroid cancer has increased significantly in the last several decades in many countries, especially papillary thyroid cancer. However, the overall mortality (death) rate has been largely unchanged. The increasing number of thyroid cancer patients can be partly explained by an increased detection of small cancers due to the widespread use of imaging techniques, such as ultrasound, computed tomography (CT) and magnetic resonance imaging (MRI) and use of fine needle aspiration biopsy. This phenomenon is called overdiagnosis, since most of these small thyroid cancers do not result in symptoms or death if left untreated. However, more recent studies looking at the data from the Surveillance, Epidemiology, and End Results (SEER) cancer registry found a significant increase in the occurrence of advanced-stage papillary thyroid cancer and large papillary thyroid cancers greater than 5 cm in diameter. Further, they found an increase in mortality in the United States, especially in patients with advanced-stage papillary thyroid cancer. An increase in exposure to possible risk factors for thyroid cancer (obesity, smoking, endocrine-disrupting chemicals) has been suggested to play a role. This comprehensive study analyzed long-term thyroid cancer mortality data from five continents using a model know as age-period-cohort models to understand the impact of risk factors on thyroid cancer mortality.

THE FULL ARTICLE TITLE

Li M et al 2020 Long term declines of thyroid cancer mortality: An international age-period-cohort analysis. Thyroid. Epub 2020 Jan 22. PMID: 31964280.

SUMMARY OF THE STUDY

Thyroid cancer mortality data by age group (ranging from 25 to 84 years), year of death, and gender were obtained from the World Health Organization (WHO) mortality database for 24 countries spanning five continents. Data for Canada, the United States, and South Africa were also obtained from United Nations World Population Prospects reports. The study time span for each country varied from 20 to 60 years. Data were divided and analyzed as 5-year time periods and 5-year age groups. In age-period-cohort (APC) models, age effects reflect risk factors associated with a certain age, period effects reflect risk factors that occur at a certain time affecting all age groups in a similar way, while cohort effects reflect unique risk factors for a generation as it moves across time.

Age-standardized mortality rates of thyroid cancer were uniformly less than 1 per 100,000 in most countries and similar for both sexes between 2011 and 2015. The highest rates were observed in Israel (0.89 per 100,000 and 0.79 per 100,000 for women and men, respectively), while the lowest rates were in France and Switzerland for women (0.38 per 100,000) and South Africa for men (0.28 per 100,000). Long-term mortality rates have declined over time in most countries. The countries with the prior highest levels and largest subsequent decrease in mortality were Switzerland and Austria. The fastest annual declines between 1986–1990 and 2011–2015 were noted in women from Switzerland, Austria, Czechia, China/Hong Kong, France, Italy, and Hungary. Declines were generally slower in men than in women. A small but statistically significant annual increase in mortality during 1986–2015 was noted for both sexes in the United States and for men in Canada. Thyroid cancer death rates increased significantly with age.

The steepest decline by period was observed in iodine-deficient regions that implemented iodine supplementation programs early (Northern and Central Europe; Alpine regions such as Austria, Switzerland, and Italy; and United States). In the United States, the initial decline stabilized after 1990 and increased slightly more recently. Cohort effects also declined in most countries over years, with more pronounced changes noted in women from Switzerland.

THYROID CANCER, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The study showed a global long-term decline in thyroid cancer mortality across countries and genders over the past 30 years with downward trends in both period and cohort effects. Possible explanations include iodine supplementation programs (since iodine deficiency and goiter are risk factors for thyroid cancer), earlier diagnosis and improved treatment for thyroid cancer. The mortality trends suggest no significant impact of exposure to known or new risk factors. Since the decrease in mortality is in contrast with the increase in the number of thyroid cancers diagnosed, the difference could be explained by overdiagnosis of small cancers that may not require treatment.

— Alina Gavrila, MD, MMSc

ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): https://www.thyroid.org/thyroid-cancer/

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer (PTC): the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

Thyroid fine needle aspiration biopsy (FNAB): a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

Surveillance, Epidemiology, and End Results (SEER) Cancer Registry: provides information on cancer statistics in the U.S. population. It is supported by the National Cancer Institute (NCI), which is a part of the National Institutes of Health (NIH) in Bethesda, MD and the federal government's primary agency for cancer research and training.

SEER: Surveillance, Epidemiology and End Results program, a nation-wide anonymous cancer registry generated by the National Cancer Institute that contains information on 26% of the United States population. Website: http://seer.cancer.gov/

Age-Period-Cohort (APC) models: *age effects* reflect risk factors associated with a certain age, *period effects* reflect risk factors that occur at a certain time affecting all age groups in a similar way, *cohort effects* reflect unique risk factors for a generation as it moves across time.