



## THYROID CANCER

# Radioactive iodine therapy for thyroid cancer increases salivary gland cancer in patients younger than age 25

### BACKGROUND

Although children and young adults rarely develop thyroid cancer, the disease is often diagnosed at an advanced stage. After surgery, many of these patients are treated with radioactive iodine, which is very effective in treating advanced thyroid cancer. Because of this, the death rate due to thyroid cancer is low in young patients, despite of advanced disease at diagnosis. As in all patients with thyroid cancer, the benefit of radioactive iodine treatment is unclear in patients without advanced cancer.

A rare complication of radioactive iodine therapy for thyroid cancer in adult patients has been associated with a slightly increased risk of developing non-thyroid cancers later in life. There is concern that the risk may be higher in children and young adults because of increased sensitivity to radiation of tissues that are growing and because of longer life-span of this patient population. The data regarding this risk is currently limited. The goal of this study is to evaluate the risk of non-thyroid cancers in patients younger than 25 years of age who received radioactive iodine treatment for thyroid cancer.

### THE FULL ARTICLE TITLE

Marti JL et al. Increased risk of second primary malignancy in pediatric and young adult patients treated with radioactive iodine for differentiated thyroid cancer. *Thyroid* 2015;25:681-7. Epub May 6, 2015.

### SUMMARY OF THE STUDY

The study data was obtained from the Surveillance, Epidemiology, and End Results (SEER), a population-based cancer registry from the National Cancer Institute. The study included 3,637 patients followed in this registry who received initial treatment for thyroid cancer with or without radioactive iodine treatment between 0-24 years of age (1973-2008). Only 266 (7.3%) patients were diagnosed with thyroid cancer before age 15. At diagnosis, 1,569 (43.9%) patients had local lymph node metastases and 166 (4.7%) patients had distant metastases. A total of 1,587 (44%) patients received radioactive iodine treatment, the percentage increasing from 4% in 1973 to 62% in 2008, although the proportion of advanced stage

thyroid cancer declined over time. The average follow-up period of the patients in the registry was 15.5 years. The overall survival at 20 years was similar in the patients who received (98.5%) and those who did not receive (97.3%) radioactive iodine treatment.

A total of 26 non-thyroid cancers were diagnosed in patients who received radioactive iodine treatment, as compared with an expected number of 18.3 cancers diagnosed in a the general population without history of thyroid cancer. The most common cancers were salivary gland cancers, noted in 3 patients compared to the expected 0.9 cancers noted in the reference population. The time for development of salivary gland cancer was 10 years after the radioactive iodine treatment. There was also a higher risk of leukemia (2 cases vs. 0.5 expected) and kidney cancer (1 case vs 0.32 expected) in thyroid cancer patients treated with radioactive iodine, however, there were only a few cases.

Over a decade, 1 in 227 young thyroid cancer patients treated with radioactive iodine will develop a non-thyroid cancer and 1 in 588 patients will develop salivary cancer attributable to the radioactive iodine treatment. The location of these cancers can be explained by the fact that the radioactive iodine is concentrated in the salivary glands, is toxic for the bone marrow and is excreted by the kidneys. The risk of developing non-thyroid cancers after from the radioactive iodine treatment for thyroid cancer was only slightly higher in young compared to adult patients. Young thyroid cancer patients who did not receive radioactive iodine treatment did not have an increased risk of non-thyroid cancers as compared to the general population without thyroid cancer.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Children and young adults who receive radioactive iodine for thyroid cancer have an increased risk of developing non-thyroid cancers later in life, mainly salivary gland cancer. There has been an increasing proportion of young patients with thyroid cancer who receive radioactive iodine treatment over time, despite



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of the diagnosis being made in less advanced stages. Importantly, survival in the young patients with low risk thyroid cancer is not improved by the radioactive iodine therapy. Therefore, it is critical to carefully weigh the benefits and risks of the radioactive iodine treatment, including the small but real risk of developing other cancers later in life before recommending this treatment in children and young adults with thyroid cancer.

— Alina Gavrilă, MD, MMSC

## **ATA THYROID BROCHURE LINKS**

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

Radioactive Iodine Therapy: <http://www.thyroid.org/radioactive-iodine>

Thyroid Surgery: <http://thyroid.org/patients/patient-brochures/surgery.html>

## **ABBREVIATIONS & DEFINITIONS**

**Radioactive iodine (RAI):** this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer.

**Thyroidectomy:** surgery to remove the thyroid gland.

**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/>

**National Cancer Institute (NCI):** a part of the National Institutes of Health in Bethesda, MD, the NCI is the federal government's primary agency for cancer research and training.

