



## HYPERTHYROIDISM

### Is there a risk of cancer following radioactive iodine therapy for hyperthyroidism?

#### BACKGROUND

Radioactive iodine therapy can be a valuable option to treat hyperthyroidism. It is taken as a pill, absorbed in the stomach and carried in the blood to the thyroid, where it is taken up into the overactive thyroid cells. The radiation then causes destruction of the overactive thyroid tissue. However, the non-overactive thyroid cells that may remain are also exposed to radiation, as are well as many tissues in the body. While radioactive iodine is very useful in treating hyperthyroidism due to Graves' disease, other treatments are available such as antithyroid drugs or surgery. Therefore, it is important to consider whether there is any potential harm from the radiation exposure.

A number of studies have been done to look for any association between radioactive iodine therapy and subsequent cancers. The results from previous studies have been varied for many reasons including the need to evaluate a large group of patients when looking for small differences, difficulty in identifying the proper comparison group, the need for long follow up and limited information regarding the radiation exposure. This study was performed to evaluate the risk of cancers in patients who were diagnosed with hyperthyroidism and then treated with radioactive iodine therapy, either with or without exposure to antithyroid drugs. The risk was compared to hyperthyroidism treated with antithyroid drugs alone over a 13 year period. In this way, the study was able to have a comparison group of patients with the same condition, but who were treated in a different way.

#### THE FULL ARTICLE TITLE

Gronich N et al 2019 Cancer risk following radioactive iodine treatment for hyperthyroidism: A cohort study. *Thyroid* 2020 Feb;30(2):243-250.

#### SUMMARY OF THE STUDY

This study used a large health care database covering more than half of the Israeli population and includes all diagnoses for these patients. They identified all adult patients from 1/2002-6/2015 with a new diagnosis of hyperthyroidism

who were treated with any anti-thyroid medication or radioactive iodine therapy. Patients were excluded if there was less than 6 months of medical history or if they had any previous cancer. Cancer diagnoses were obtained from the database and from the Israeli National Cancer Registry through 6/2016. End points were the first, new diagnosis of cancer appearing at least 1 year after entry, death or end of registration in the database.

A total of 16,637 patients were included in the study with an average follow up of 7.3 years. The majority of patients (13,808) were treated with anti-thyroid drugs alone, while 2829 patients received radioactive iodine therapy (1808 of whom also had anti-thyroid drugs). Most patients were treated with radioactive iodine therapy only once (95.3%), 4.6% received radioactive iodine therapy twice and only 3 patients received 3 or 4 treatments. A total of 825 new cancers were diagnosed during follow up.

The authors did not find any difference in the risk of any cancer at all and specifically no increased risk for breast cancer, colorectal cancer, prostate cancer, stomach cancer or urinary tract cancer which are areas with potential higher exposure to the radioactivity. There was a lower risk for thyroid cancer and a slightly higher risk for non-Hodgkin's lymphoma that did not reach statistical significance once other factors were included.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that there was no increased risk for subsequent cancers in patients treated with radioactive iodine for hyperthyroidism as compared to patients treated with antithyroid drugs. While the study is not randomized it is one of the largest studies evaluating this question. However, it does suffer from the problems of using a large database for analysis. Some of the possible confounding information is not available, such as actual doses of radioactive iodine used and concerns that information can be misclassified. However, overall, it supports the use of radioactive iodine as a safe treatment option for hyperthyroidism.

— Marjorie Safran, MD



## HYPERTHYROIDISM, continued

### ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): <https://www.thyroid.org/hyperthyroidism/>

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

### ABBREVIATIONS & DEFINITIONS

**Hyperthyroidism:** a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

**Graves' disease:** the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

**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 and with an overactive thyroid. **I-123** is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (*Thyroid Scan*) or to take pictures of the whole body to look for thyroid cancer (*Whole Body Scan*).



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