



HYPERTHYROIDISM

Risk of cancer after treatment of hyperthyroidism

BACKGROUND

The management of hyperthyroidism includes three primary options: radioactive iodine therapy, antithyroid drugs (ATDs) and thyroidectomy (surgery to remove some or all of the thyroid). Practice patterns have varied significantly over time and in different parts of the world, in part owing to potential adverse effects, both short- and long-term, of each of the treatment options. In particular, there has been a concern about the long term risk of developing cancer after radioactive iodine therapy for hyperthyroidism.

The Cooperative Thyrotoxicosis Therapy Follow-up Study (CTTFUS) is a large database of patients treated for hyperthyroidism in the United States and United Kingdom between the 1940s and 1960s. A 1998 study had initially examined the risk of death from cancer in the CTTFUS group. A recent update from this groups reported a positive association between the dose of radioactive iodine and death from solid cancers, including breast cancers. This study expands to also include patients with hyperthyroidism who were treated with ATDs and surgery, in addition to those who received radioactive iodine therapy. This study was done to look at the effects of the treatment options for hyperthyroidism on the likelihood of getting cancer.

THE FULL ARTICLE TITLE

Kitahara CM et al 2020 Association of radioactive iodine, antithyroid drug, and surgical treatments with solid cancer mortality in patients with hyperthyroidism. *JAMA Netw Open* 3(7): e209660. PMID: 32701159.

SUMMARY OF THE STUDY

The original CTTFUS group included 35,593 patients with hyperthyroidism treated with radioactive iodine therapy, ATDs and thyroidectomy or a combination of these at 26 centers (25 in the United States, 1 in the United Kingdom) between January 1, 1946, and December 31, 1964. Of these, 31,583 were eligible for follow-up through 1990 and 31,363 U.S. patients were eligible for follow-up through December 31, 2014; these

included 25,455 with death records available, 3089 found or presumed to be alive, and 2829 lost to follow-up. The study involved a review of medical charts to look at the risk of cancer in patients treated for hyperthyroidism. The data collected was studied to look at the differences if any based on age, gender and type of treatment.

Of the 31,363 patients, 22,357 (71.3%) were treated with ATDs (alone or in combination with other treatments), 19,589 (62.5%) with radioactive iodine therapy, 13,676 (43.6%) with surgery; 7474 (23.8%) were treated only with radioactive iodine therapy, 1138 (3.65%) only with ATDs, and 800 (2.6%) with surgery alone. For those treated with radioactive iodine therapy, 12,979 (66.3%) received one course of treatment and the overall average dose for all patients who received was 8 mCi.

The average follow-up was 26.0 years, with the shortest duration in the ATD-only group (20.2 years) and the longest in the ATD and surgery group (33.6 years). The highest proportion of cancer-related deaths occurred in the ATD-only (160 [18.3%]) and ATD and surgery (1413 [18.6%]) groups. Overall, 59 patients (5.2%) in the ATD-only group died of cancer in the first 5 years of follow-up, as compared with 74 (0.8%) in the ATD and surgery group and 193 (2.1%) in the other groups; there also was a higher rate of prior cancers in this group.

After excluding prior cancers and adjusting for patient age, sex, and underlying diagnosis, there was no significant difference in the likelihood of death from cancers (solid cancers such as breast and other solid organs) across treatment groups outlined above. For patients treated with radioactive iodine therapy, the risk of death from cancers increased with an increase in the dose.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that there was no significant difference in the likelihood of death from cancers (solid cancers such as breast and other solid organs) across different treatment groups for hyperthyroidism (ATDs,





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radioactive iodine therapy or surgery). However, the dose of radioactive iodine therapy was linked to a modestly increased risk of death from these cancers. It is important to understand this link so patients understand

the long term effects of these treatments and make the right decision for themselves in consultation with their physician/health care provider.

—Vibhavasu Sharma,MD,FACE

ATA THYROID BROCHURE LINKS

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

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

Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>

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.

Methimazole: an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.

Propylthiouracil (PTU): an antithyroid medication that blocks the thyroid from making thyroid hormone. Propylthiouracil is used to treat hyperthyroidism, especially in women during pregnancy.

Radioactive iodine: 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).

Thyroidectomy: surgery to remove the thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

