AMERICAN THYROID ASSOCIATION
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Clinical Thyroidology® for the Public

VOLUME 12 | ISSUE 2 | FEBRUARY 2019

HYPOTHYROIDISM

Thyroid hormone therapy does not improve symptoms in subclinical hypothyroidism

Whether or not to treat subclinical hypothyroidism is controversial as benefits of treating have not been proven in many cases. One area particularly controversial is with patient symptoms. Multiple studies were done to answer whether treatment would help patients with subclinical hypothyroidism with significant symptoms, with mixed results. The aim of this study was to analyze the results of previously published studies on subclinical hypothyroidism to determine the association of thyroid hormone therapy with quality of life and thyroid related symptoms.

Feller M et al 2018 Association of thyroid hormone therapy with quality of life and thyroid-related symptoms in patients with subclinical hypothyroidism: a systematic review and meta-analysis. JAMA 320:1349–1359. PMID:30285179.

THYROID AND PREGNANCY

Low iodine nutrition in mothers during pregnancy is associated with lower language skills in children up to 18 months of age.

Iodine is an essential nutrient to make thyroid hormone. It is estimated that pregnant women do not get enough iodine intake even in some developed countries. Since enough iodine to make enough thyroid hormone in pregnancy is important for normal baby's development, this study was done to evaluate whether mother's iodine status in pregnancy is associated with the baby's development up to 18 months of age in Norway.

Markhus MW et al. 2018 Maternal Iodine Status is Associated with Offspring Language Skills in Infancy and Toddlerhood. Nutrients. 10(9). pii: E1270. doi: 10.3390/nu10091270.

THYROID AND PREGNANCY

Maternal hypothyroidism is associated with a higher risk of childhood asthma

When hypothyroidism in pregnancy is not properly treated, there may be complications such as pregnancy loss, premature delivery, and decreased intelligence in the child. It is unclear if there is a link between hypothyroidism during pregnancy and the risk of asthma in children. The goal of this study is to examine whether hypothyroidism during pregnancy affected the risk of developing childhood asthma.

Liu X et al Maternal hypothyroidism in the perinatal period and childhood asthma in the offspring. Allergy 2018; 73:932–939. Epub 2017 Dec 12. PMID: 29159833.

THYROID CANCER

Molecular marker studies in papillary thyroid cancer provide information on cancer prognosis

Recent availability of testing for gene mutations in thyroid biopsy specimens, so-called molecular markers, has provided insight to the prognosis of some thyroid cancers and also to the cause of the cancers. This can allow the identification of cancers that are at high risk vs low risk for spreading outside the thyroid. This study uses molecular markers to determine both prognosis of papillary cancer and the importance of papillary cancer spreading to the lymph nodes of the neck.

Ren H et al 2018 Co-existence of *BRAF*^{V600E} and *TERT* promoter mutations in papillary thyroid carcinoma is associated with tumor aggressiveness, but not with lymph node metastasis. Cancer Manag Res. Epub 2018 May 3. PMID: 29760568.

THYROID CANCER

Low dose radioactive iodine is as effective as high dose for low-risk thyroid cancer

Radioactive iodine therapy has been used to treat thyroid cancer for decades. It is unclear whether there are true benefits from radioactive iodine therapy in lower-risk thyroid cancer patients. Additionally, the best dose of radioactive iodine has not been established for low-risk patients that do get that radioactive iodine therapy. This study compared survival and recurrence after low and higher doses of radioactive iodine after thyroid surgery.

Schlumberger M et al 2018 Outcome after ablation in patients with low-risk thyroid cancer (ESTIMABL1): 5-year follow-up results of a randomised, phase 3, equivalence trial. Lancet Diabetes Endocrinol 6:618–626. Epub 2018 May 26. PMID: 29807824.

THYROID CANCER

High-dose radioactive iodine therapy decreases local recurrence for high-risk papillary thyroid cancer

After surgery, patients at intermediate or higher risk of thyroid cancer recurrence are treated with radioactive iodine therapy, which destroys cancer cells. However, this treatment can have side effects and the higher the dose of radioactive iodine used, the more common and severe these side effects will be. This study looked at the effects of high and low doses of radioactive iodine on cancer recurrence and side effects in patient with papillary thyroid cancer.

Gray KD et al 2018 High-dose radioactive iodine therapy is associated with decreased risk of recurrence in high-risk papillary thyroid cancer. Surgery. Epub 2018 Sep 28. PMID: 30274732

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Clinical Thyroidology® for the Public

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EDITOR'S COMMENTS

Welcome to another issue of *Clinical Thyroidology for the Public*. In this journal, we will bring to you the most up-to-date, cutting edge thyroid research. We also provide even faster updates of late-breaking thyroid news through Twitter at @thyroidfriends and on Facebook. Our goal is to provide patients with the tools to be the most informed thyroid patient in the waiting room. Also check out our friends in the **Alliance for Thyroid Patient Education**. The **Alliance** member groups consist of: the *American Thyroid Association, Bite Me Cancer, the Graves' Disease and Thyroid Foundation, the Light of Life Foundation, ThyCa: Thyroid Cancer Survivors' Association, Thyroid Cancer Canada, Thyroid Cancer Alliance* and *Thyroid Federation International*.

The American Thyroid Association (ATA) extends its appreciation to all of the patients and their families that are part of the ATA community — our **Friends of the ATA**. It is for you that the ATA is dedicated to carrying out our mission of providing reliable thyroid information and resources, clinical practice guidelines for thyroid detection and treatments, resources for connecting you with other patients affected by thyroid conditions, and cutting edge thyroid research as we search for better diagnoses and treatment outcomes for thyroid disease and thyroid cancer.

As we think of all those who make a difference in our lives, we thank you for being part of the ATA family and for all of the Friends of the ATA who support our mission and work throughout the year to support us. We invite you to help keep the ATA mission strong by choosing to make a donation that suits you — it takes just one moment to give online at: www.thyroid.org/donate and all donations are put to good work. The ATA is a 501(c)3 nonprofit organization and your gift is tax deductible.

The editorial board of CTFP, the ATA Board of Directors, Members, and ATA Headquarters Staff, wish you the best and look forward to being part of your thyroid network in 2019.

February is Hypothyroidism Awareness Month.

In this issue, the studies ask the following questions:

- Does treatment of subclinical hypothyroidism help patient symptoms?
- Does poor iodine nutrition in pregnant mothers affect the baby?
- Does hypothyroidism in pregnant mothers increase the risk of childhood asthma?
- Do molecular markers provide information on cancer prognosis?
- Does the dose of RAI affect response in patients with low risk thyroid cancer?
- Does high dose RAI affect local recurrence rates?

We welcome your feedback and suggestions. Let us know what you want to see in this publication. I hope you find these summaries interesting and informative.

— Alan P. Farwell, MD, FACE

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HYPOTHYROIDISM

Thyroid hormone therapy does not improve symptoms in subclinical hypothyroidism

BACKGROUND

Subclinical hypothyroidism is diagnosed when TSH levels are high but the thyroid hormone levels are still normal. It represents a mild form of hypothyroidism. Whether or not to treat subclinical hypothyroidism is controversial as benefits of treating have not been proven in many cases. One area particularly controversial is with patient symptoms. Overt hypothyroidism can cause symptoms such as tiredness, constipation, unexplained weight gain and may be associated with heart disease, elevated blood pressure, or high cholesterol. While some patients with subclinical hypothyroidism do not have symptoms, many do have significant symptoms that may seem out of proportion to their thyroid hormone abnormalities. Multiple studies were done in the past to answer whether treatment would help patients with subclinical hypothyroidism with significant symptoms, but they had looked at different outcomes using very different methods.

The aim of this study was to review and analyze the results of previously published studies on subclinical hypothyroidism to determine the association of thyroid hormone therapy with quality of life and thyroid related symptoms.

THE FULL ARTICLE TITLE

Feller M et al 2018 Association of thyroid hormone therapy with quality of life and thyroid-related symptoms in patients with subclinical hypothyroidism: a systematic review and meta-analysis. JAMA 320:1349–1359. PMID:30285179.

SUMMARY OF THE STUDY

Nonpregnant adults with subclinical hypothyroidism were studied. Researchers identified randomized clinical trials that compared thyroid hormone therapy with no therapy. The studies were evaluated for the quality of information, design, and results. A total of 21 studies, with a total of 2192 individuals were included in the analysis. The age range was 32 – 74 years. Baseline TSH values were 4.4 – 12.8 mIU/L and were in the normal range in the thyroid hormone treated groups after 3-18 months of therapy while they remained elevated in the groups that were not treated. There was no improvement in general quality of life, hypothyroid symptoms, depressive symptoms, blood pressure, body mass index (BMI), or cognitive function (memory, thinking).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study showed that thyroid hormone therapy to normalize the TSH in patients with subclinical hypothyroidism did not improve general quality of life or thyroid related symptoms. These findings are important for patients diagnosed with subclinical hypothyroidism since routine treatment may not be necessary for everyone. Patients and physicians should carefully discuss whether to start thyroid hormone therapy and set treatment goals.

—Ebru Sulanc, MD, FACE

ATA THYROID BROCHURE LINKS

Hypothyroidism (Underactive): https://www.thyroid.org/hypothyroidism/
Thyroid Function Tests: https://www.thyroid.org/thyroid-function-tests/
Thyroid Hormone Treatment: https://www.thyroid.org/thyroid-hormone-treatment/

HYPOTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

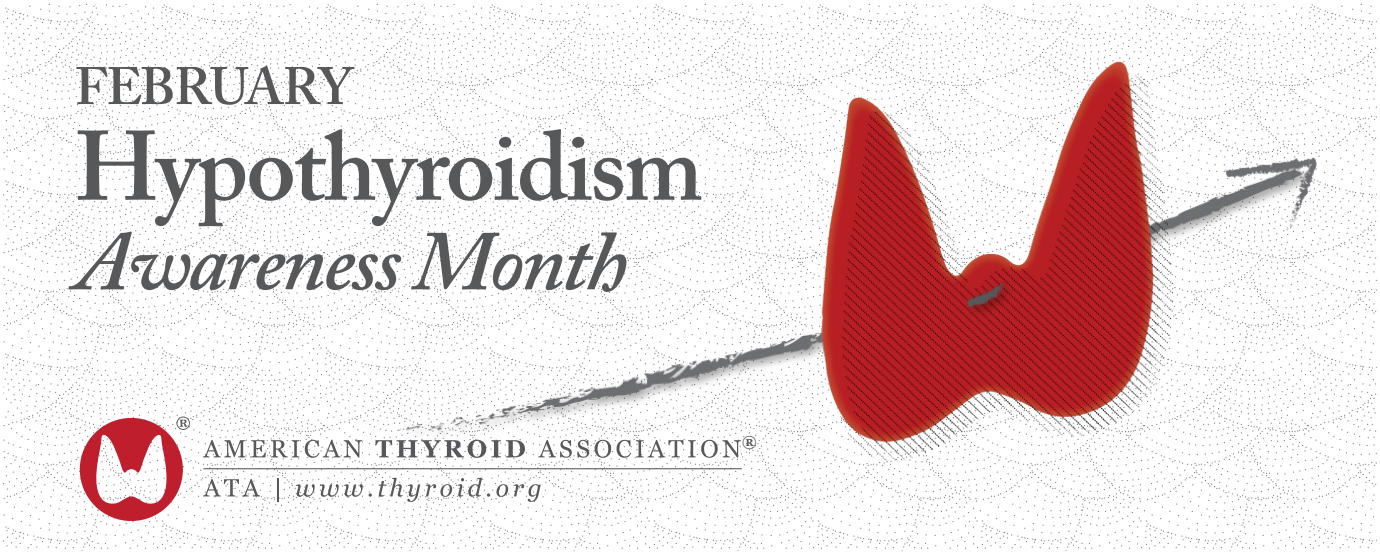
Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Subclinical Hypothyroidism: a mild form of hypothyroidism where the only abnormal hormone level is an increased TSH. There is controversy as to whether this should be treated or not.

Overt Hypothyroidism: clear hypothyroidism an increased TSH and a decreased T4 level. All patients with overt hypothyroidism are usually treated with thyroid hormone pills.

TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also, the best screening test to determine if the thyroid is functioning normally.

Thyroid hormone therapy: patients with hypothyroidism are most often treated with Levothyroxine to return their thyroid hormone levels to normal. *Replacement therapy* means the goal is a TSH in the normal range and is the usual therapy.



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THYROID AND PREGNANCY

Low iodine nutrition in mothers during pregnancy is associated with lower language skills in children up to 18 months of age.

BACKGROUND

Iodine is an essential nutrient to make thyroid hormone. Adequate thyroid hormone during pregnancy is very important for baby's normal brain development. Because mothers need to make more thyroid hormone to provide for the baby and there is more iodine cleared out in urine during pregnancy, pregnant women need more iodine than non-pregnant adults. It is estimated that pregnant women do not get enough iodine intake even in some developed countries. Since enough iodine to make enough thyroid hormone in pregnancy is important for normal baby's development, this study was done to evaluate whether mother's iodine status in pregnancy is associated with the baby's development up to 18 months of age in Norway.

THE FULL ARTICLE TITLE

Markhus MW et al. 2018 Maternal Iodine Status is Associated with Offspring Language Skills in Infancy and Toddlerhood. Nutrients. 10(9). pii: E1270. doi: 10.3390/nu10091270.

SUMMARY OF THE STUDY

A total of 851 mother-child pairs in Norway were included in this study. Pregnant women were enrolled when they were 16-26 weeks pregnant between 2011 and 2012. Their children from singleton pregnancy were enrolled after birth. None of mothers in this study took thyroid medications. Urine samples were collected from pregnant women when they were enrolled. Women were asked whether they were taking iodine-containing supplements for 3 months before enrollment in a questionnaire. Children's development was assessed using the Bayley Scales of Infant and Toddler Development, third edition (Bayley-III) at 6, 12, and 18 months of age.

The mean gestational age at the time of urine collection was 23.7 weeks. The median urinary iodine concentration (UIC) was 78 μg/L (range 4-750 μg/L). A total of 676 (79%) of women had UICs less than 150 μg/L, which is the cutoff recommended by the World Health Organization for adequate iodine nutrition status in pregnant women in a population. A total of 242 (28%) women had UICs less the 50 μg/L, which indicates severe iodine deficiency. The median UIC was higher in 155 (18%) women who were taking iodine-containing supplements during pregnancy compared to those who were not taking iodine-containing supplements (92 μg/L vs. 77 μg/L, respectively).

Children of women with UICs < 100 μg/L had lower scores in language skills compared to children of women with UICs ≥ 100 μg/L. Mother's UICs did not have significant association with children's motor skills. Mother's use of iodine-containing supplements was not associated with any benefit in children's development up to 18 months of age.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In this study of mother-child pairs from Norway, low iodine levels in mothers below 100 μg/L in pregnancy was associated with lower language skills in children up to 18 months of age. Taking iodine-containing supplements later in pregnancy did not show any beneficial effects on children's development.

Because there is increased need for iodine in pregnancy, pregnant women and their young children can be particularly sensitive to effects of iodine deficiency. This study supports need for adequate iodine nutrition in pregnant women. The American Thyroid Association currently recommends for women planning pregnancy, pregnant, or breastfeeding to take supplements containing 150 μg of iodine a day. Although taking iodine-containing supplements did not show beneficial effects in this study, it may be because the use of supplements were later in pregnancy in the second trimester. In addition, women who were taking iodine-containing supplements also had low urine iodine levels below 150 μg/L. Therefore, it would be important for pregnant women or women planning pregnancy to have adequate iodine nutrition before or early in pregnancy to prevent adverse effects on baby's development.

— Sun Y. Lee, MD

THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

Iodine Deficiency: https://www.thyroid.org/iodine-deficiency/

Pregnancy and Thyroid Disease: https://www.thyroid.org/thyroid-disease-pregnancy/

ABBREVIATIONS & DEFINITIONS

Iodine: an element found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. Common foods high in iodine include iodized salt, dairy products, seafood and some breads.

UIC: Urinary iodine concentration — Measure of iodine levels in urine. This is used to estimate status of iodine nutrition in a population level.

Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

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THYROID AND PREGNANCY

Maternal hypothyroidism is associated with a higher risk of childhood asthma

BACKGROUND

Hypothyroidism is a condition where the thyroid does not produce enough thyroid hormone. Hypothyroidism in the mother can affect 2–5% of pregnancies. Thyroid hormone is important for growth and development of the baby during pregnancy. When hypothyroidism in pregnancy is not properly treated, there may be complications such as pregnancy loss, premature delivery, and decreased intelligence in the child. It is unclear if there is a link between hypothyroidism during pregnancy and the risk of asthma (a disease involving the airways in the lungs) in children. The goal of this study is to examine whether hypothyroidism during pregnancy affected the risk of developing childhood asthma.

THE FULL ARTICLE TITLE

Liu X et al Maternal hypothyroidism in the perinatal period and childhood asthma in the offspring. Allergy 2018; 73:932–939. Epub 2017 Dec 12. PMID: 29159833.

SUMMARY OF THE STUDY

This was a population-based study using data from national registries in Denmark. Data was used to estimate the risk of asthma among children born to mothers with hypothyroidism compared to children born to mothers with no thyroid problems. A total of 595,669 children were included. Of those, 3,524 of the children were born to mothers with hypothyroidism diagnosed before delivery and 4,664 children were born to mothers with hypothyroidism diagnosed within 5 years after delivery. A total of 48,990 children had treatment for asthma. Children born to mothers with hypothyroidism who were taking thyroid hormone replacement during pregnancy had a 16% higher risk of asthma when compared to children with mothers who had no thyroid problems. If the mothers did not fill their thyroid hormone prescriptions, the risk increased to 37%. The risk was lowest (12%) in children born to mothers diagnosed with hypothyroidism after delivery.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Proper treatment of hypothyroidism in pregnancy is important and this study adds childhood asthma to the risk of children born to women with hypothyroidism. The data also suggests that the risk was highest in women who were not treated with thyroid hormone during pregnancy and ~2-fold greater than if women were treated. Screening for thyroid disease during pregnancy is controversial but this data suggests another possible reason to screen pregnant women for thyroid disease.

— Priya Mahajan, MD

ATA THYROID BROCHURE LINKS

Pregnancy and Thyroid Disease: https://www.thyroid.org/thyroid-disease-pregnancy/
Hypothyroidism (Underactive): https://www.thyroid.org/hypothyroidism/

ABBREVIATIONS & DEFINITIONS

Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Thyroid hormone therapy: patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal.

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THYROID CANCER

Molecular marker studies in papillary thyroid cancer provide information on cancer prognosis

BACKGROUND

Thyroid cancer is the fastest rising cancer in women. The approach to the management of thyroid cancer currently is based on the risk of the thyroid cancer persisting or recurring after initial treatment. This is especially important in low risk thyroid cancers, which are the most common and fastest rising. Recent availability of testing for gene mutations in thyroid biopsy specimens, so-called molecular markers, has provided insight to the prognosis of some thyroid cancers and also to the cause of the cancers. This can allow the identification of cancers that are at high risk vs low risk for spreading outside the thyroid. Already, molecular markers have been helpful in identifying a variant of papillary cancer that may not be a cancer after all. Finally, these molecular markers may be used to determine effective treatment approaches.

This study uses molecular markers to determine both prognosis of papillary cancer and the importance of papillary cancer spreading to the lymph nodes of the neck.

FIRST FULL ARTICLE TITLE

Ren H et al 2018 Co-existence of *BRAF*^{V600E} and *TERT* promoter mutations in papillary thyroid carcinoma is associated with tumor aggressiveness, but not with lymph node metastasis. Cancer Manag Res. Epub 2018 May 3. PMID: 29760568.

SUMMARY OF THE STUDY

The subjects of this study were 342 consecutive patients who underwent thyroidectomy for papillary thyroid carcinoma. Of these, 85% underwent total thyroidectomy and the remainder underwent lobectomy. Pre-op neck ultrasound indicated that 251 patients did not have abnormal lymph nodes prior to surgery while 91 patients did have evidence for the spread of the cancer into the lymph nodes of the neck. Central lymph node dissections were performed in all patients and 94% also underwent lateral lymph node dissections. *BRAF* V600E and the *TERT* promoter mutations C228T and C250T were analyzed after in all of the surgery specimens.

There were 99 men and 243 women, ranging in age from 13 to 81 years, with an average age of 42 years. Microcarcinomas (<1 cm) were present in 39% of the patients. The *BRAF* V600E mutation was present in 270 patients (*BRAF*+) and absent in 72 patients (*BRAF*–), *TERT* promoter mutations were present in only 12 patients. All patients who were positive for the *TERT* promoter mutations also were positive for the *BRAF* V600E mutation. The average age of *BRAF*+ patients was about 4 years older than *BRAF*– patients while *BRAF*+*TERT*+ patients were 26 years older than *BRAF*- patients. A total of 83.3% of *BRAF*+*TERT*+ patients had extrathyroidal extension as compared 30.7% *BRAF*+ patients and 26.4% *BRAF*– patients. The *BRAF*+*TERT*+ patients also had larger cancers and more advanced disease at diagnosis. However, there was no significant relationship between *BRAF*+ or *BRAF*+*TERT*+ and spread if the cancer to central or lateral neck lymph nodes.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that, in patients with papillary thyroid cancer, *BRAF*+*TERT*+ status is associated with older patient age, larger cancer size and a more advanced cancer stage, as compared with patients patients who are *BRAF*+ or *BRAF*–. This and further studies using molecular markers will help doctors identify cancers that are more aggressive and which require more aggressive treatment.

— Alan P. Farwell, MD, FACE

ATA THYROID BROCHURE LINKS

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

THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Molecular markers: genes and microRNAs that are expressed in benign or cancerous cells. Molecular markers can be used in thyroid biopsy specimens to either to diagnose cancer or to determine that the nodule is benign. The two most common molecular marker tests are the AfirmaTM Gene Expression Classifier and ThyroseqTM

Mutation: A permanent change in one of the genes.

Genes: a molecular unit of heredity of a living organism. Living beings depend on genes, as they code for all proteins and RNA chains that have functions in a cell. Genes hold the information to build and maintain an organism's cells and pass genetic traits to offspring.

Papillary thyroid cancer: 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).

Papillary microcarcinoma: a papillary thyroid cancer smaller than 1 cm in diameter.

Follicular thyroid cancer: the second most common type of thyroid cancer.

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THYROID CANCER

Low dose radioactive iodine is as effective as high dose for low-risk thyroid cancer

BACKGROUND

Radioactive iodine therapy has been used as part of the treatment plan for patients with thyroid cancer for decades. At one point, most patients received radioactive iodine therapy after thyroidectomy. Currently, more emphasis is placed on the risk of cancer recurrence after surgery to determine whether radioactive iodine therapy was indicated. There is not good data on whether there are true benefits (ie, improved survival and/or decreased cancer recurrence) from radioactive iodine therapy in lower-risk thyroid cancer patients. Additionally, the best dose of radioactive iodine has not been established for low-risk patients that do get that radioactive iodine therapy. Low doses of radioactive iodine very rarely have lasting side effects whereas higher doses can have long term effects with complications such as dry mouth.

In order to treat with radioactive iodine therapy, TSH levels need to be high to stimulate any remaining thyroid tissue, normal and cancerous, and increase the uptake of radioactive iodine into the cells. There are 2 ways to do this: 1) stop thyroid hormone become hypothyroid for a short time (thyroid hormone withdrawal) or 2) treat with 2 injections of recombinant human TSH (rhTSH, Thyrogen™).

This study compared survival and recurrence after low and higher doses of radioactive iodine after thyroid surgery as well as comparing way the radioactive iodine was delivered (after recombinant TSH vs after thyroid hormone withdrawal).

THE FULL ARTICLE TITLE

Schlumberger M et al 2018 Outcome after ablation in patients with low-risk thyroid cancer (ESTIMABL1): 5-year follow-up results of a randomised, phase 3, equivalence trial. Lancet Diabetes Endocrinol 6:618–626. Epub 2018 May 26. PMID: 29807824.

SUMMARY OF THE STUDY

This was a randomized clinical trial at 24 centers in France from 2007-2010 that enrolled patients >18 years of age with low risk thyroid cancer and had a total thyroidectomy. Patients either got thyroid withdrawal or rhTSH stimulation before radioactive iodine treatment. Patients had serial neck ultrasounds and serum thyroglobulin levels performed. Patients were considered to have no evidence of the cancer if the neck ultrasound was negative and the thyroglobulin level was undetectable.

No patient died of thyroid cancer during the follow up period. At the last follow-up, 715 (98%) of the 726 patients had no evidence of the cancer. Of the other 11 patients: 4 had ultrasound/imaging evidence of thyroid cancer (2 had spread to the lung, 1 had spread to the neck lymph nodes and 1 had both); 5 had detectable serum thyroglobulin concentrations on levothyroxine treatment ranging from 1.2 to 4.2 ng/ml and no other evidence of the cancer; and 2 with serum thyroglobulin of <1 ng/ml and indeterminate findings on neck ultrasonography that were not submitted to biopsy. Of these 11 patients with persistent cancer, 6 received low dose radioactive iodine (5 after rhTSH, 1 after withdrawal) and 5 received high dose radioactive iodine (2 after rhTSH and 3 after withdrawal).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Low dose radioactive iodine ablation therapy is equivalent to higher doses in patients with low risk thyroid cancer in terms of recurrence and survival. Additionally, the mode of TSH stimulation does not impact outcomes as well. This is important because patients with low risk thyroid cancer can be reassured that both rhTSH stimulation as well as low radioactive iodine doses provide good outcomes while simultaneously decreasing the likelihood of side effects for patients.

— Melanie Goldfarb, MD

THYROID CANCER, continued

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer: 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).

Cancer metastasis: spread of the cancer from the initial organ where it developed to other organs, such as the lungs and bone.

Thyroidectomy: surgery to remove the entire 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*.

Total thyroidectomy: surgery to remove the entire thyroid gland.

Thyroglobulin antibodies: these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

Thyroglobulin: a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker in patients that do not have thyroglobulin antibodies.

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*).

Thyroid Remnant Ablation: destruction of the small amount of thyroid tissue that remains after surgery (thyroidectomy) with the use of radioactive iodine.

Recombinant human TSH (rhTSH): human TSH that is produced in the laboratory and used to produce high levels of TSH in patients after an intramuscular injection. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan. The brand name for rhTSH is Thyrogen™.

Thyroid Hormone Withdrawal (THW): this is used to produce high levels of TSH in patients by stopping thyroid hormone pills and causing short-term hypothyroidism. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan.

Lymph node: bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

Cancer recurrence: this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

Clinical trials: when a new drug is developed, it must undergo an extensive series of steps, called phases, to prove that it is more effective in patients than the drugs that are currently available to treat the condition. A **Phase I** trial tests a new drug or treatment in a small group of people for the first time to evaluate its safety, determine a safe dosage range and identify side effects. A **Phase II** trial gives the drug to a larger group of people to see if it is effective and to further evaluate its safety. A **Phase III** trial gives the drug to large groups of people to confirm its effectiveness, monitor side effects, compare it to commonly used treatments and collect information that will allow the drug or treatment to be used safely.

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THYROID CANCER

High-dose radioactive iodine therapy decreases local recurrence for high-risk papillary thyroid cancer

BACKGROUND

After surgery, patients at intermediate or higher risk of thyroid cancer recurrence are treated with radioactive iodine therapy, which produces ionizing radiation that destroys cancer cells. Thyroid tissue, including both the normal thyroid cells and thyroid cancer cells, is one of the few tissues in the body that absorbs iodine. The most common form of thyroid cancer (papillary thyroid cancer) is known to absorb iodine and can be killed by For these reasons, radioactive iodine therapy can be used to target and kill papillary thyroid cancer cells, especially when these cells manage to spread out of the thyroid to other parts of the body (usually to lymph nodes in the neck and sometimes to more distant areas such as the lungs and the bones). Even though radioactive iodine is very good at specifically targeting thyroid cancer cells, this treatment can have side effects and the higher the dose of radioactive iodine used, the more common and severe these side effects will be. This study looked at the effects of high and low doses of radioactive iodine on cancer recurrence and side effects in patient with papillary thyroid cancer.

THE FULL ARTICLE TITLE

Gray KD et al 2018 High-dose radioactive iodine therapy is associated with decreased risk of recurrence in high-risk papillary thyroid cancer. Surgery. Epub 2018 Sep 28. PMID: 30274732

SUMMARY OF THE STUDY

The purpose of this study was to compare the effect of two different doses of radioactive iodine on the risk of papillary thyroid cancer recurring after thyroid surgery in people known to be at a high risk for such recurrence and the risk of side effects from radioactive iodine treatment. This study started by looking at the medical records of over 1500 people treated for papillary thyroid cancer during a ten-year period of time at three different hospitals (two in France and one in the United States). The study then narrowed the number of people included to 183, which were those people for whom the risk of papillary thyroid cancer coming back (recurring) was the highest. These 183 people were then divided into groups according to the dose of radioactive iodine they received after thyroid surgery: 117 were in the lower dose group and 66 were in the higher dose group. Using mathematical tools to compare these groups, the study authors found that:

1. Papillary thyroid cancer was more likely to recur in the neck, but not at other body sites, for those people receiving the lower dose of radioactive iodine.

2. When papillary thyroid cancer did recur in the neck, this happened sooner after radioactive iodine treatment in the lower dose group compared to the higher dose group.

3. Side effects of radioactive iodine treatment were only seen for those people receiving the higher dose of radioactive iodine.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The best dose of radioactive iodine to use for treatment of papillary thyroid cancer after thyroid surgery is still unclear, especially among people for whom the risk of this cancer recurring in the neck, or elsewhere in the body, is the highest. This study shows that the risk of cancer recurrence in the neck was lower when a higher dose of radioactive iodine is given and a higher dose of radioactive iodine produced more side effects. Together, these findings imply that the best dose of radioactive iodine to prevent of papillary thyroid cancer redevelopment in the neck after thyroid surgery, specifically in cases having high risk for such recurrence, will depend on balancing the best chance of preventing disease recurrence with the lowest chance of suffering treatment side effects.

— Jason D. Prescott, MD PhD

THYROID CANCER, continued

ATA THYROID BROCHURE LINKS

Radioactive Iodine: https://www.thyroid.org/radioactive-iodine/
Thyroid Cancer (Papillary and Follicular): https://www.thyroid.org/thyroid-cancer/
Thyroid Surgery: https://www.thyroid.org/thyroid-surgery/

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer: 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).

Cancer recurrence: this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

Cancer metastasis: spread of the cancer from the initial organ where it developed to other organs, such as the lungs and bone.

Lymph node: bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

Thyroidectomy: surgery to remove the entire 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*.

Ionizing radiation: radiation that can damage cells, causing cell death or mutation. It can originate from radioactive materials, x-ray tubes or specialized machines. It is invisible and not directly detectable by human senses.

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*).

AMERICAN THYROID ASSOCIATION
ATA | Founded 1923

Clinical Thyroidology® for the Public

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ATA Alliance for Thyroid Patient Education

GOAL The goal of our organizations is to provide accurate and reliable information for patients about the diagnosis, evaluation and treatment of thyroid diseases. We look forward to future collaborations and continuing to work together toward the improvement of thyroid education and resources for patients.

WHO WE ARE (in alphabetical order)

American Thyroid Association
www.thyroid.org
ATA Patient Resources:
www.thyroid.org/thyroid-information/
Find a Thyroid Specialist: www.thyroid.org
(Toll-free): 1-800-THYROID
thyroid@thyroid.org

Bite Me Cancer
www.bitemecancer.org
info@bitemecancer.org

Graves' Disease and Thyroid Foundation
www.gdatf.org
(Toll-free): 877-643-3123
info@ngdf.org

Light of Life Foundation
www.checkyourneck.com
info@checkyourneck.com

Thyca: Thyroid Cancer Survivors' Association, Inc.
www.thyca.org
(Toll-free): 877-588-7904
thyca@thyca.org

Thyroid Cancer Alliance
www.thyroidcanceralliance.org
www.thyroidcancerpatientinfo.org
Rotterdam, The Netherlands

Thyroid Cancer Canada
www.thyroidcancercanada.org
416-487-8267
info@thyroidcancercanada.org

Thyroid Federation International
www.thyroid-fed.org
tfi@thyroid-fed.org

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Friends of the ATA

FOUNDED 2005

Get the latest thyroid health information. You'll be among the first to know the latest cutting-edge thyroid research that is important to you and your family.

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By subscribing to *Friends of the ATA Newsletter*, you will receive:

- *Friends of the ATA e-news*, providing up-to-date information on thyroid issues, summaries of recently published articles from the medical literature that covers the broad spectrum of thyroid disorders., and invitations to upcoming patient events
- Updates on the latest patient resources through the ATA website and elsewhere on the world wide web
- Special e-mail alerts about thyroid topics of special interest to you and your family

We will use your email address to send you *Friends of the ATA e-news* and occasional email updates. We won't share your email address with anyone, and you can unsubscribe at any time.

www.thyroid.org

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Donate Now!

JOIN US

"The ATA was a valuable resource for our family when my dad was diagnosed with Anaplastic Thyroid Cancer. When you're faced with a detrimental diagnosis where even a few days can make the difference in life or death, understanding your options quickly is critical. The ATA website offers a one-stop shop for patients and caregivers to find specialists, current clinical trials, general thyroid cancer information, and links to other patient support groups and information."

Mary Catherine Petermann
- Father who was diagnosed with Anaplastic Thyroid Cancer in 2006
- He was treated at Mayo Clinic
- He has clean scans as of October 2016

PLEASE JOIN OUR JOURNEY TO ADVANCED DISCOVERIES AND TREATMENT FOR THYROID DISEASE AND THYROID CANCER

As patients with thyroid disease navigate the challenges to their quality of life and researchers and physicians look for more effective directions, we at the ATA have our own destination– **funding for critical thyroid research, prevention, and treatment.** For 94 years, the ATA has led the way in thyroidology. It's a daily obstacle course to find new drugs, better treatments, advanced surgical methods, and more rapid diagnoses for the 20 million Americans who have some form of thyroid disease.

The ATA has paved the way with management guidelines for clinicians who diagnose and treat thyroid disease. For physicians treating pregnant women diagnosed with thyroid disease, our recent publication presents 97 evidence-based recommendations making sure that best practices are implemented with the latest, most effective treatment.

Through your generous support and donations, research takes the lead and hope is on the horizon. **Will you join us** in our campaign to raise **$1.5 million** for thyroid research, prevention, and treatment? Your compassionate, tax-deductible gift will provide funds for:

- Research grants that pave the way for 1,700 ATA physicians and scientists who have devoted their careers to understanding the biology of and caring for patients affected by thyroid disease.
- Patient education for individuals and families looking for life-changing clinical trials, the best thyroid specialists, and cutting edge treatment and drugs.
- Professional education that offers a wealth of knowledge and leading-edge research for trainees and practitioners.
- A website that is the go-to resource for thyroid information for patients and practitioners alike. In 2016 alone, there were more than 3,700,000 website views of ATA's library of online thyroid information patient brochures.

Donations **of all sizes** will change the future for thyroid patients. You will make a direct impact on patients like Mary Catherine's father as he deals with Anaplastic Thyroid Cancer. You will help scientists like ATA Associate Member Julia Rodiger, Ph.D., a scientist at the National Institutes of Health, as she analyzes thyroid hormones for intestinal stem cell development.