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Clinical Thyroidology® for the Public

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Clinical Thyroidology® for the Public

www.thyroid.org

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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 X (previously known as 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, MCT8 – AHDS Foundation, ThyCa: Thyroid Cancer Survivors' Association,* and *Thyroid Federation International.*

We invite all of you to join our **Friends of the ATA** community. It is for you that the American Thyroid Association® (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. We thank 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.

April is Hashimoto's Thyroiditis Awareness Month.

In this issue, the studies ask the following questions:

- Can radiofrequency ablation effectively treat autonomously functioning thyroid nodules?
- Does the history of pregnancy and pregnancy loss affect the development of thyroid problems?
- Are thyroid cancer presentations and treatment results different for Asian patients?
- What is the TSH target in patients with low-risk thyroid cancer?
- Is methimazole effective in preventing contrast-induced thyrotoxicosis?
- Thyroid surgery and chronic kidney disease: Is there a link?

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

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THYROID NODULES

Can radiofrequency ablation effectively treat autonomously functioning thyroid nodules?

BACKGROUND

Thyroid nodules are common, occurring in up to 50% of the population. Most thyroid nodules work normally in that, while they can grow quite large, they do not produce excess thyroid hormone. However, 5-7% of thyroid nodules work on their own and do not turn off, leading to an overactive nodule. This is termed autonomously functioning thyroid nodule (AFTN). AFTNs secrete excess thyroid hormone, which can cause hyperthyroidism leading to symptoms such as palpitations, weight loss, tremors and anxiety. The standard treatment for AFTNs is surgical removal of the abnormal thyroid tissue or by administering radioactive iodine therapy, which significantly shrinks the nodule and helps treat hyperthyroidism. While effective, these treatments may lead to surgical complications, radiation exposure, and permanent hypothyroidism requiring lifelong thyroid hormone replacement.

A newer, much less invasive procedure called radiofrequency ablation (RFA) has emerged as an alternative treatment for thyroid nodules. RFA uses heat to destroy abnormal thyroid tissue while preserving healthy thyroid cells. Guided by ultrasound, the physician inserts a probe into the middle of the nodule and applies an electrical current to destroy the surrounding tissue. Originally developed to treat nonfunctional thyroid nodules, RFA could potentially treat AFTNs.

In this study, the authors evaluate the effectiveness of RFA in reducing the size of AFTNs and resolving hyperthyroidism while minimizing complications such as permanent hypothyroidism.

THE FULL ARTICLE TITLE

Dhanasekaran M, et al. Outcomes of radiofrequency ablation for autonomously functioning thyroid adenomas—Mayo Clinic experience. J Endocr Soc 2024;8(12)

SUMMARY OF THE STUDY

The authors reviewed the records of 22 patients who underwent RFA for a single autonomously functioning thyroid nodule at the Mayo Clinic between 2013 and 2021. Their main goal was to determine whether RFA could successfully treat hyperthyroidism in these patients. They also examined whether RFA reduced nodule size, improved symptoms, and caused any side effects or complications.

Of the 22 patients, 77% were female. Most (73%) had subclinical hyperthyroidism (low TSH but normal FT4), 9% had overt hyperthyroidism (low TSH and high FT4), and the remaining 18% had normal thyroid hormone levels but were on anti-thyroid drugs. Within 3 to 6 months after a single RFA treatment, 20 patients (91%) saw their TSH levels return to normal, indicating improvement in hyperthyroidism. Of the 2 patients with persistent hyperthyroidism, one underwent a second RFA treatment and achieved normal thyroid function. Nodule size decreased significantly in 21 out of 22 patients. Complications were rare — only two patients developed mild hypothyroidism requiring thyroid hormone replacement, and two patients experienced temporary worsening of their hyperthyroidism after treatment, but no life-threatening complications occurred.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This small study included patients who could afford a costly procedure. Additionally, a highly skilled radiologist with experience in thyroid imaging performed the RFA, but such specialists may not be widely available, thus making it challenging to expand the procedure. Despite this, the results suggest that RFA could effectively treat autonomously functioning thyroid nodules (AFTNs).

— Phillip Segal, MD

THYROID NODULES, continued

ATA RESOURCES

Hyperthyroidism (Overactive): https://www.thyroid.org/hyperthyroidism/
Thyroid Nodules: https://www.thyroid.org/thyroid-nodules/

ABBREVIATIONS & DEFINITIONS

Thyroid nodule: an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

Autonomously functioning thyroid nodules (AFTN): characterized by one or more nodules or lumps in the thyroid that may gradually grow and increase their activity so that the total output of thyroid hormone in the blood is greater than normal.

Radiofrequency ablation (RFA): using radiowave-based heat delivered by a needle to destroy abnormal tissue or lymph nodes containing cancer.

Subclinical Hyperthyroidism: a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

Over Hyperthyroidism: where the thyroid gland produces excessive thyroid hormones, leading to clear symptoms such as weight loss, rapid heartbeat, and sweating. It is diagnosed by low TSH levels and high free T3 and/or T4 levels in the blood

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THYROID AND PREGNANCY

Does the history of pregnancy and pregnancy loss affect the development of thyroid problems?

BACKGROUND

Thyroid hormone plays an important role in female reproductive health. Abnormal thyroid function can result in irregular menses, infertility, and pregnancy complications. However, it is unclear whether the reverse is true, where female reproductive health conditions affect thyroid function. Changes in female reproductive hormones and immune status that occur in pregnancy may contribute to permanent changes in mother's endocrine function after pregnancy. Studies have reported an increase in breast cancer risk and risk of type 2 diabetes after multiple pregnancies in women. Other studies have suggested that pregnancy may affect mothers' thyroid function after pregnancy. Menopause has been associated with development in autoimmune antibodies and autoimmune thyroid disease is the most common cause of thyroid problems in the United States.

There are not many long-term studies evaluating effects of changing female reproductive status, such as pregnancy and menopause, on thyroid function. The authors of this study explored possible associations between number of pregnancies, miscarriages, and menopause and thyroid status over 12 years of follow up.

THE FULL ARTICLE TITLE

Shariatzadeh S, et al. Female reproductive system and thyroid dysfunction: findings from a 12-year follow-up in the Tehran Thyroid Study. Thyroid 2024;34(11):1424-1434. doi: 10.1089/thy.2024.0245. PMID: 39463260.

SUMMARY OF THE STUDY

A total of 2711 Iranian women from the Tehran Thyroid Study, where they had study evaluation every 3 years for 12 years, were included. Data at the beginning of the study (baseline) were used to assess potential associations between number of pregnancies, pregnancy loss before 20 weeks of pregnancy, and menopause and the development of thyroid problems. Data from 2191 women at the end of 12-year follow up were used to evaluate how development of new thyroid dysfunction during the follow-up period was associated with number of pregnancies, pregnancy loss, and menopause.

At baseline, women with history of more than 4 pregnancies were 1.12 x more likely to have overt hypothyroidism (high blood TSH level and low FT4 level) and 1.11 x more likely to have subclinical hyperthyroidism (low TSH and normal FT4 level) compared to women who were never pregnant. Women with history of multiple pregnancy loss were 2 x more likely to have overt hyperthyroidism than women without history of pregnancy loss. Over the follow-up periods, women with history of more than 4 pregnancies were about 2 x more likely to develop new subclinical hypothyroidism, and about 6 times more likely to develop new overt hypothyroidism compared to women were never pregnant. Women with history of pregnancy were less likely to develop new overt hypothyroidism than women without history of pregnancy loss. Menopause status did not affect presence of thyroid problems as baseline or development of new thyroid problems over the follow-up periods.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The findings of the study suggest that women's reproductive history, including number of pregnancies and history of pregnancy loss, may play a role in development of thyroid dysfunction. On the other hand, menopausal state did not affect development of thyroid dysfunction. It is thought that some fetal tissue may transfer to mothers during pregnancy and later cause autoimmune response in mothers, which may lead to development of thyroid autoimmunity and subsequent thyroid dysfunction. However, previous studies have not clearly shown an increase in thyroid autoimmunity after pregnancy, so this may not entirely explain the findings of this study.

THYROID AND PREGNANCY, continued

Currently available evidence is not enough to clearly state that prior pregnancy affects subsequent thyroid function in mothers. Further studies are needed to confirm the findings of this study and evaluate the underlying mechanism.

However, it would be reasonable for clinicians to adopt a personalized approach in monitoring thyroid function, especially in women with complex pregnancy history.

— Sun Y. Lee, MD MSc

ATA RESOURCES

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

ABBREVIATIONS & DEFINITIONS

Autoimmune disorders: A diverse group of disorders that are caused by antibodies that get confused and attack the body's own tissues. The disorder depends on what tissue the antibodies attack. Graves' disease and Hashimoto's thyroiditis are examples of autoimmune thyroid disease. Other Autoimmune disorders include: type 1 diabetes mellitus, Addison's disease (adrenal insufficiency), vitiligo (loss of pigment of some areas of the skin), systemic lupus erythematosus, pernicious anemia (B12 deficiency), celiac disease, inflammatory bowel disease, myasthenia gravis, multiple sclerosis, and rheumatoid arthritis.

Autoimmune thyroid disease: a group of disorders that are caused by antibodies that get confused and attack the thyroid. These antibodies can either turn on the thyroid (Graves' disease, hyperthyroidism) or turn it off (Hashimoto's thyroiditis, hypothyroidism).

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.

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.

Subclinical Hyperthyroidism: a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

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.

Thyroxine (T4): the major hormone produced by the thyroid gland. T4 gets converted to the active hormone T3 in various tissues in the body.

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Optimal Thyroid Health for All

Volume 18 | Issue 4 | April 2025

Clinical Thyroidology® for the Public

THYROID CANCER

Are thyroid cancer presentations and treatment results different for Asian patients?

BACKGROUND

Thyroid cancer is common, especially in women. Fortunately, many/most of these thyroid cancers are low risk and the prognosis is excellent due to very effective treatments. A variety of studies have shown that thyroid cancer is more common in patients that identify as non-Hispanic Whites and Asian American and/or Pacific Islander (AAPI) as compared to other ethnicities. AAPI patients are a diverse group of people. Despite this, AAPI patients have been grouped together commonly for research and population studies.

This study subdivides AAPI patients into various ethnicities to see if there is a difference in the stage at presentation or treatment responses of thyroid cancer when comparing different ethnicities.

THE FULL ARTICLE TITLE

Zhao HH and Wilhelm SM. Exploring ethnic diversity and clinical outcome variabilities in well-differentiated thyroid cancer among the Asian population. Surgery 2025;177:108827; doi: 10.1016/j.surg.2024.05.049. PMID: 39384480.

SUMMARY OF THE STUDY

In the National Cancer Database, patients who listed their race as Asian American and/or Pacific Islander (AAPI) were analyzed for their thyroid cancer responses to therapy. From 2004 to 2019, patients who were 18 years and older were analyzed. The patient was not included if he/she did not provide their race/ ethnicity. The AAPI patients were subdivided into the following 12 Asian ethnicities: Chinese, Japanese, Filipino, Korean, Vietnamese, Laotian, Hmong, Kampuchean, Thai, Asian Indian, Pakistani, and Pacific Islander. Of the total 364,604 patients, the largest subgroup was Chinese (3851 patients), followed by Filipino (3466) and Korean (1567). Hmong patients was the smallest group with 50 patients.

There were differences found in the surgical specimen pathology and death rates when AAPI patients were compared to patients of non-Hispanic White race/ ethnicity. About 73.7%- 86% of the patients studied were female. Japanese patients were the oldest (average age 54), and Asian Indian and Pakistani patients were the youngest (average age 41). Chinese patients were the healthiest with the least medical problems outside of the thyroid cancer, while Pakistani patients had the most medical problems outside of the thyroid cancer. Asian Indian patients had the highest socioeconomic status, and Thai patients had the highest rate of being uninsured. Although they received the same surgery, Hmong patients had a high rate (44%) of having a positive margin (likely cancer left behind in the body) compared to 9.7% of non-Hispanic White patients. Asian patients had a 28.2%-32% chance of the cancer spreading to the lymph nodes compared to 19.8% of non-Hispanic White patients. Spread to other organs such as lung and bone was most common in the Japanese (9.5%) and Filipino (8.8%) populations. Asian Indians had the highest 5- and 10-year overall survival (98.3% and 95.7%). Laotian patients had the lowest 5-year overall survival (90.7%), and Kampuchean patients the lowest 10-year overall survival (84.2%).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that Chinese, Japanese, and Filipino patients are at increased risk of having thyroid cancer spread to the lymph nodes and other organs as well as more aggressive or fast-growing cancer. Chinese, Korea, Vietnamese, Asian Indian, and Pacific Islanders had a lower risk of death than non-Hispanic White patients, but other Asian subgroups did not. These results suggest that patients may benefit from more personalized thyroid cancer treatments. It is important to separate out the various ethnicities in the AAPI populations to better observe trends in the way patients present with the disease and respond to treatment.

— Pinar Smith, MD

THYROID CANCER, continued

ATA RESOURCES

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).

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

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.

Asian American and/or Pacific Islander (AAPI): a diverse group of people that includes 12 Asian ethnicities. Despite this, AAPI patients have been grouped together commonly for research and population studies.

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Optimal Thyroid Health for All

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THYROID CANCER

What is the TSH target in patients with low-risk thyroid cancer?

BACKGROUND

Standard treatment for high-risk thyroid cancer patients includes total thyroidectomy followed by radioactive iodine treatment and thyroid hormone treatment to suppress TSH levels. Lowering the TSH level to less than 0.1 mU/L has been shown to decrease cancer recurrence and improve survival in high-risk thyroid cancer patients. However, TSH suppression can result in an increased risk for atrial fibrillation, bone loss and osteoporosis and an overall decrease in the quality of life.

Fortunately, most patients have low-risk thyroid cancer and treatment may be limited to removing only the lobe containing the thyroid cancer (lobectomy) and deferring radioactive iodine treatment. For low-risk thyroid cancer, the 2015 American Thyroid Association (ATA) guidelines recommend starting thyroid hormone treatment after the patients undergo either total thyroidectomy or lobectomy to keep the TSH in the low normal range (0.5-2.0 mU/L). However, the evidence behind this recommendation is limited. Starting thyroid hormone treatment requires laboratory monitoring and physician visits, which can increase the health care costs, while overtreatment can harm the patients. The goal of this study was to evaluate whether maintaining the TSH in the high normal range (2-4.0 mU/L) increases the recurrence risk as compared to the currently recommended low-normal TSH goal range (0.5-2.0 mU/L) in patients with low-risk thyroid cancer after thyroid surgery.

THE FULL ARTICLE TITLE

Qiang JK, et al. Association between serum thyrotropin and cancer recurrence in differentiated thyroid cancer: a population-based retrospective cohort study. Thyroid. Epub 2024 Dec 26; doi: 10.1089/thy.2024.0330. PMID: 39723994.

SUMMARY OF THE STUDY

This study included 26,336 patients with thyroid cancer included in the Ontario Cancer Registry between 2007 and 2018. This registry captures 99% of cancer cases in Ontario. Serum TSH values and the dates of measurement were obtained from the Ontario Laboratories Information System, which captures most outpatient laboratory tests in Ontario. The study included patients older than 18 years of age diagnosed with thyroid cancer and who had at least one TSH test result recorded during follow-up. The patients started to be followed for TSH measurements and thyroid cancer recurrence 12 months after their initial thyroid surgery. The average serum TSH for 90-day intervals was used for analysis. The primary analysis evaluated the time from the initial thyroid surgery to thyroid cancer recurrence in the high normal TSH (2-4 mU/L) group as compared to the reference low normal TSH (0.5–2 mU/L) group. The recurrence in the TSH <0.5 mU/L and TSH >4 mU/L groups was also evaluated as secondary analysis. Recurrence was defined as the need for additional treatment, including new surgery or radioactive iodine treatment or death due to thyroid cancer after the initial surgery.

Most study patients were women (78%) living in urban centers (93%), with an average age of 50. A total of 21% of patients underwent lobectomy, 41% had total thyroidectomy, and 38% had total thyroidectomy followed by radioactive iodine treatment. The average follow-up was 5.9 years, and the average TSH was 0.6 mU/L. During the follow-up period, 2,817 (10%) patients had thyroid cancer recurrence. Among these patients, 361 (1.3%) underwent completion thyroidectomy, 689 (2.6%) had neck dissection, 1664 (6.3%) received radioactive iodine treatment, and 103 (0.3%) died from thyroid cancer.

There was no increase in the recurrence risk in patients maintained with a high normal TSH (2- 4 mU/L) levels as compared to the low normal TSH (0.5-2 mU/L) levels. However, there was a higher risk of thyroid cancer recurrence with exposure to TSH levels >4 mU/L as compared to low normal TSH range (0.5–2 mU/L). This was most apparent after 4 years of exposure to higher TSH levels.

THYROID CANCER, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Patients with low-risk thyroid cancer who maintained TSH levels in the high normal range (2 - 4 mU/L) had similar cancer recurrence rates as compared to those with TSH levels in the low normal range (0.5–2 mU/L), which is the currently recommended treatment target by the ATA guidelines. This is important data to consider when treating these patients. It also is clear that the recurrence risk increased when TSH was >4 mU/L. These results suggests that the serum TSH target could be broadened to 0.5–4 mU/L in patients with low-risk thyroid cancer. New ATA thyroid cancer guidelines will be published later this year and, hopefully, these new targets will be discussed.

— Alina Gavrila, MD, MMSC

ATA RESOURCES

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

ABBREVIATIONS & DEFINITIONS

Total thyroidectomy: surgery to remove the entire thyroid gland.

Lobectomy: surgery to remove one lobe of the thyroid.

Completion thyroidectomy: surgery to remove the remaining thyroid lobe after an initial lobectomy

Neck dissection: surgery to remove lymph nodes and surrounding tissues from the mid neck area close to the thyroid gland (central neck dissection) or from the lateral neck area (lateral neck dissection).

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 hormone therapy: patients who undergo thyroidectomy are treated with Levothyroxine in order 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. Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

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.

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

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CONTRAST-INDUCED THYROTOXICOSIS

Is methimazole effective in preventing contrast-induced thyrotoxicosis?

BACKGROUND

Iodine is essential for normal thyroid function. The thyroid hormones all contain iodine. Not enough iodine in the diet can cause decreased production of the thyroid hormones and hypothyroidism. Indeed, iodine deficiency is the most common cause of hypothyroidism in many parts of the world. Too much iodine, on the other hand, can cause or worsen thyrotoxicosis, particularly in patients with thyroid conditions.

Contrast media commonly used in some radiological studies, such as CT scans, contain very high amounts of iodine. Getting these high levels of iodine during these scans can cause a short-lived thyrotoxicosis in some patients. This is known as contrast-induced thyrotoxicosis. To avoid such complications, treating patients before getting these scans with antithyroid drugs such as methimazole (MMI) has been recommended by some. In fact, some small studies have shown beneficial effects of using antithyroid drugs before exposure to contrast to prevent contrast-induced thyrotoxicosis. The current study was done to evaluate the effectiveness of MMI in preventing contrast induced thyrotoxicosis, particularly in patients with prior history of thyroid conditions.

THE FULL ARTICLE TITLE

Ayalon-Dangur DI, et al. Methimazole for prevention of iodinated contrast media induced exacerbation of thyrotoxicosis in susceptible patients. Endocr Pract. Epub 2024 Nov22:S1530-891X(24)00833-4;

SUMMARY OF THE STUDY

This study was done is Israel. The authors looked at the thyroid levels of 179 hospitalized patients before and after receiving iodinated contrast. All the patients had a history of thyroid conditions and 91% were already taking MMI before receiving contrast. Overall 64% were women, their average age was 72 years and 26% had Graves' disease. The MMI dose was adjusted according to the physician's recommendations. Of the patients who had low TSH levels before admission, indicating a mild degree of hyperthyroidism, 19% normalized the thyroid levels after discharge and 62% had lower FT4 levels. These improvements in thyroid levels were due to an increase in their MMI dose. Of the patients who had normal TSH levels, 71% continued to be in the normal range while only 13% developed low TSH levels indicating a mild hyperthyroid state. Of the patients whose TSH levels were elevated before receiving contrast, about half continued to have mild TSH elevations at discharge, indicating a mild hypothyroid state.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Treatment with MMI in patients with hyperthyroidism who receive iodinated contrast helps prevent contrast-induced thyrotoxicosis in most patients. However, this study does not answer the question of what to do for patients without thyroid disease who receive iodinated contrast. For now, MMI treatment before iodinated contrast could be considered only for those patients with pre-existing hyperthyroidism.

— Susana Ebner MD

ATA RESOURCES

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

Graves' Disease: https://www.thyroid.org/graves-disease/

CONTRAST-INDUCED THYROTOXICOSIS, continued

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.

Thyrotoxicosis: a condition of increased levels of thyroid hormone in the blood. The most common cause of thyrotoxicosis is hyperthyroidism. Less common is a thyroiditis.

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.

Thyroiditis: inflammation of the thyroid, most commonly cause by antibodies that attack the thyroid as seen in Hashimoto's thyroiditis and post-partum thyroiditis. It can also result from an infection in the thyroid.

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.

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.

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THYROID SURGERY

Does thyroid surgery increase the risk of chronic kidney disease?

BACKGROUND

Thyroid surgery is recommended for the treatment of thyroid cancer and a variety of non-cancer thyroid diseases, including Graves' disease and large and/or obstructive thyroid nodules and goiters. Thyroid surgery is safe with few complications, especially if the surgery is done by surgeons that do many thyroid operations annually. A potential complication of thyroid surgery is hypoparathyroidism caused by damage to the parathyroid glands causing hypocalcemia (low calcium levels). The parathyroid glands produce parathyroid hormone (PTH) that regulates calcium levels. PTH interacts with the bones, the kidneys and Vitamin D to regulate calcium levels. Because there are 4 total parathyroid glands (2 on each side of the thyroid), hypoparathyroidism is only seen after a total thyroidectomy. When it occurs, post-surgical hypoparathyroidism is usually mild and short-lived, usually resolving in 2-3 weeks.

Post-surgical permanent hypoparathyroidism is much more serious and is often difficult to treat. Further, treatment requires calcium levels to be maintained within a very narrow range. Permanent hypoparathyroidism has been associated with long-term problems, including an increased risk of heart and kidney disease as well as neurological problems. The most concerning risks of permanent hypoparathyroidism are related to kidney problems, including nephrocalcinosis (build up of calcium deposits in the kidney), kidney stones and chronic kidney disease (CKD).

This study was done to understand the risk of developing hypoparathyroidism and CKD after total thyroidectomy.

THE FULL ARTICLE TITLE

Reinke R, et al. Increased risk of chronic kidney disease after total thyroidectomy: a nationwide matched cohort study. J Clin Endocrinol Metab. Epub 2024 Aug 10:dgae534; doi: 10.1210/clinem/dgae534. PMID: 39126399.

SUMMARY OF THE STUDY

This study was conducted in Denmark. A review of patient charts from 1998-2017 was done using four nationwide Danish registries and a total of 2421 patients were identified who had undergone a total thyroidectomy. The study included patients > 18 years and who were not on a vitamin D supplement, calcium or had kidney disease before the surgery. They then assessed the long-term risk of developing CKD at 1, 5 and 10 years after surgery. Patients were matched with sex-matched individuals identified from the Danish Civil Registry System who had not had thyroid surgery and did not have CKD or hypoparathyroidism.

Of the patients who had undergone a thyroidectomy, 521(21.5%) were classified as having chronic hypoparathyroidism. The authors found the risk of CKD to be higher in those who underwent thyroid surgery despite their parathyroid status as compared to the control group that did not have thyroid surgery. At 10 years, the risk of CKD for patients who had hypoparathyroidism after thyroidectomy was 13.5%, as compared to 11.6% of the surgery patients with normal parathyroid function and 5.8% for the control group. Overall, the risk for development of CKD was 3.23 x the non-surgery group for the hypoparathyroid patients and 2.23 x the non-surgery group for patients with normal parathyroid function. Overall, patients who underwent thyroidectomy for hyperthyroidism had the highest risk for developing CKD, 4.59 x the non-surgery group.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that patients who undergo total thyroidectomy may be at a higher risk for developing CKD if they develop hypoparathyroidism after the surgery or had the surgery for hyperthyroidism. More clinical studies that assess this correlation further would be needed to understand the long-term impact of thyroidectomy on

THYROID SURGERY, continued

developing the postoperative complication of CKD and the underlying reasons that may increase the patient's risk of developing this complication. It would also be important to evaluate the risk of developing CKD after thyroid surgery done by high volume thyroid surgeons, in whom the risk of permanent hypoparathyroidism is markedly less (~1%) than seen in this study.

—Vibhavasu Sharma, MD

ATA RESOURCES

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

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

ABBREVIATIONS & DEFINITIONS

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 or a lobectomy.

Hypocalcemia: low calcium levels in the blood, a complication from thyroid surgery that is usually short-term and relatively easily treated with calcium pills. If left untreated, low calcium may be associated with muscle twitching or cramping and, if severe, can cause seizures and/or heart problems.

Parathyroid glands: usually four small glands located around the thyroid that secrete parathyroid hormone (PTH) which regulates the body's calcium levels.

Parathyroid hormone (PTH): the hormone that regulates the body's calcium levels. High levels of PTH cause hypercalcemia, or too much calcium in the blood. Low levels of PTH cause hypocalcemia, or too little calcium in the blood.

Hypoparathyroidism: low calcium levels due to decreased secretion of parathyroid hormone (PTH) from the parathyroid glands next to the thyroid. This can occur as a result of damage to the glands during thyroid surgery and usually resolves. This may also occur as a result of autoimmune destruction of the glands, in which case it is usually permanent.

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

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Clinical Thyroidology® for the Public

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.

ATA®
Optimal Thyroid Health for All

Graves' Disease & Thyroid Foundation

ThyCa: Thyroid Cancer Survivors' Association, Inc.
www.thyca.org

Light of Life Foundation
checkyourneck.com

MCT8 - AHDS Foundation

BITE ME CANCER!

Thyroid Federation International

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

MCT8 – AHDS Foundation
mct8.info
Contact@mct8.info

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

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

AMERICAN THYROID ASSOCIATION
ATA | *Founded 1923*

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