Volume 16 | Issue 11 | November 2023

Clinical Thyroidology® for the Public

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Amiodarone-induced thyrotoxicosis (AIT) can be difficult to treat because there are two different types that need different treatments. Since patients who are treated with amiodarone have underlying heart disease, it is important to quickly control thyrotoxicosis in these patients to minimize its impact on heart. This study examined whether the initial treatment received by patients with AIT affects cardiovascular outcomes.

Cappellani D et al 2023 Real-life data on the effect of medical therapy for amiodarone-induced thyrotoxicosis on CV events and hospitalizations. J Clin Endocrinol Metab 108:1298–1307. PMID: 36585895.

Studies done in the past have tried to figure out if older people who have thyroid surgery are more likely than younger people to suffer those complications but the results were mixed. Some studies showed more complications and some reported no difference. This study tries to determine if there is a difference in complications of thyroid surgery between patients in their 80s (octogenarians) and younger patients

Sakowitz S et al 2023 Thyroid surgery outcomes in octogenarians: A national analysis. Surgery. Epub 2023 Apr 11. PMID: 37055292

Monitoring of small cancers by ultrasound instead of pursuing surgery, called active surveillance, has become an accepted treatment option. Similarly, active surveillance without biopsy is recommended for small nodules <1 cm, even if these nodules have suspicious features on ultrasound. This study was done to determine if there is a specific age cutoff that would help predict the risk of significant growth of small suspicious nodules.

Zhuge, L et al 2023. The optimal age threshold for stratifying the risks of disease progression in patients with highly suspicious sub-centimeter thyroid nodules. Ann Surg Oncol **30:**5463–5469. PMID: 37061650.

Most papillary thyroid cancers are low-risk cancers and surgery may only remove the lobe with the cancer. This study was done to find out how often there might still be papillary thyroid cancer in the other side of the thyroid when only one lobe was removed. They were especially looking for the effects of having cancer on both sides of the thyroid (bilateral cancer) or having more than one area of cancer in the same thyroid lobe (multifocal cancer).

Rodriguez Schaap PM et al 2023 Bilaterality, not multifocality, is an independent risk factor for recurrence in low-risk papillary thyroid cancer. J Natl Cancer Inst. Epub 2023 Jun 2. PMID: 37267155.

During radioactive iodine therapy for thyroid cancer, the radioactive iodine can be taken up in the tear duct and salivary glands. This exposure can cause inflammation, blockages, and a range of symptoms, including pain, dry mouth, dry eyes, mouth infections, taste disturbances, and digestion issues. In this study, the authors of the current study set out to investigate whether a) radioactive iodine truly causes tear duct and salivary gland problems, b) the relationship between the dose of radiation and symptoms, and c) the patient factors that may predict the likelihood of developing problems six months after radioactive iodine therapy.

Baudin C et al 2023 . Dysfunction of the salivary and lacrimal glands after radioiodine therapy for thyroid cancer: Results of the START study after 6-months of follow-up. Thyroid. Epub 2023 Jun 23.

During severe illness, conversion of T4 to T3 is downregulated, leading to low T3 levels, termed the "low T3 syndrome". There are studies that show that nutritional support in the hospital can decrease the likelihood of developing the low T3 syndrome. This study investigated the role of the low T3 syndrome on clinical outcomes and response to nutritional support in patients admitted in the hospital.

Müller NA et al 2023 Low T3 syndrome on admission and response to nutritional support in malnourished medical inpatients. J Clin Endocrinol Metab **108:**e240–e248. PMID: 36546619.

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Clinical Thyroidology® for the Public

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, Thyroid Cancer Canada, Thyroid Cancer Alliance* 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.

November is Hyperthyroidism Awareness Month.

In this issue, the studies ask the following questions:

- Does treatment of amiodarone-induced thyrotoxicosis decrease heart complications?
- Do older people have more complications after thyroid surgery than younger individuals?
- Can age predict growth of small, suspicious appearing thyroid nodules?
- Can we predict the return of thyroid cancer after lobectomy?
- How common are tear duct and salivary gland problems after RAI for thyroid cancer?
- Can nutritional support improve outcomes in the low T3 syndrome?

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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Clinical Thyroidology® for the Public

HYPERTHYROIDISM

Timely and appropriate treatment of amiodarone-induced thyrotoxicosis is important to decrease heart complications.

BACKGROUND

Amiodarone is a medication used to manage difficult-to-treat irregular heart rhythms (arrhythmias). Amiodarone can cause various types of thyroid problems, including thyrotoxicosis, a condition of high thyroid hormone levels. Amiodarone-induced thyrotoxicosis (AIT) can be difficult to treat because there are two different types that need different treatments. Type 1 AIT is caused by high iodine content of amiodarone, a main component of thyroid hormone, leading to excess production of thyroid hormone by the thyroid gland. Type 2 AIT is caused by inflammation of the thyroid gland from amiodarone, leading to release of excess amount of preformed and stored thyroid hormone from the thyroid gland. Type 1 AIT is treated with antithyroid drugs to stop thyroid hormone production. Type 2 AIT is treated with steroid to decrease inflammation.

Thyrotoxicosis can cause rapid or irregular heart rhythms. Since patients who are treated with amiodarone have underlying heart disease, it is important to quickly control thyrotoxicosis in these patients to minimize its impact on heart. Because diagnosis may not be always clear, there may be delay in diagnosis and starting appropriate treatment for AIT. This study examined whether the initial treatment received by patients with AIT affects cardiovascular outcomes.

THE FULL ARTICLE TITLE

Cappellani D et al 2023 Real-life data on the effect of medical therapy for amiodarone-induced thyrotoxicosis on CV events and hospitalizations. J Clin Endocrinol Metab 108:1298–1307. PMID: 36585895.

SUMMARY OF THE STUDY

A total of 313 patients with AIT who were referred to and treated at the University of Pisa in Italy between January 1997 and May 2020 were included in the study. Information from their medical records were used.

Patients were divided into two groups based on initial treatment received before they were seen at the University of Pisa Endocrine specialty clinic: appropriate therapy group if they received appropriate treatment for the type of AIT, and inappropriate therapy group if they received no treatment or the wrong treatment for the type of AIT. Outcomes compared between two groups included duration of thyrotoxicosis, and frequencies of heart problems (including arrhythmia, congestive heart failure, heart attack and stroke), hospitalization, and urgent thyroid surgeries performed to control thyrotoxicosis.

Among 313 patients, 108 patients received appropriate therapy and 205 received inappropriate therapy. Patients in the inappropriate therapy group had longer duration of thyrotoxicosis. Patients in the inappropriate therapy group had more heart events compared to those in the appropriate therapy group (33% vs 5%). In addition, patients in the inappropriate therapy group had more hospitalizations and urgent thyroid surgeries compared to those in the appropriate therapy group (25% vs 7% for hospitalization, and 7% vs 2% for urgent thyroid surgeries). Side effects from the treatment were minimal and similar between two groups.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that in patients with amiodarone-induced thyrotoxicosis, starting appropriate treatment quickly decreases duration of thyrotoxicosis and risks of adverse heart events, hospitalization, and urgent thyroid surgeries. This study shows that it is important to accurately diagnose the type of AIT. Distinguishing two types of AIT can be confusing at times. If the type of AIT is not clear, starting treatment for both types of AIT with continued re-evaluation may be indicated to minimize risks of heart problems in patients.

— Sun Y. Lee, MD, MSc

HYPERTHYROIDISM, continued

ATA RESOURCES

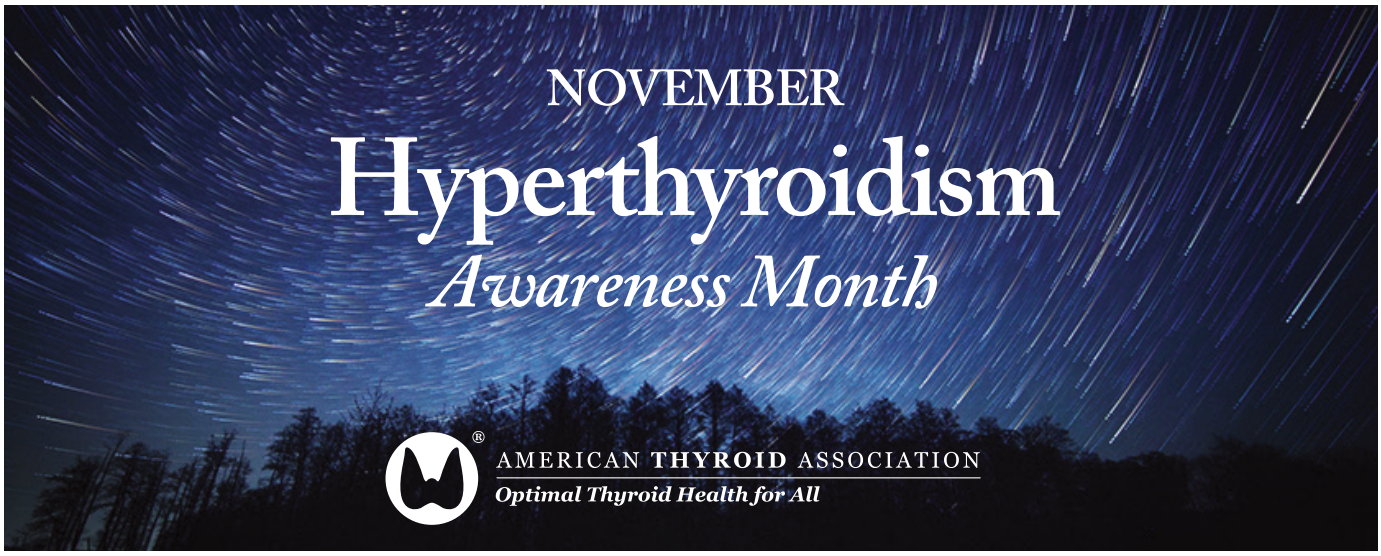
Hyperthyroidism (Overactive): https://www.thyroid.org/hyperthyroidism/

ABBREVIATIONS & DEFINITIONS

Amiodarone: an iodine-rich drug that is commonly used for the treatment of irregular heart rhythms. Amiodarone can cause thyroid problems, including both hypothyroidism and hyperthyroidism.

Thyrotoxicosis: a state of elevated thyroid hormone levels. It can be caused by excessive production of thyroid hormone in the thyroid gland (hyperthyroidism) or from excessive release of preformed thyroid hormones from the thyroid gland due to inflammation or destruction.

Amiodarone induced Thyrotoxicosis: elevated thyroid hormone levels that can occur as a result of excessive iodine from amiodarone resulting in increased thyroid hormone production (type I) and secretion or to destruction of thyroid cells with release of thyroid hormone into the blood (type II).



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THYROID SURGERY

Older people have more complications after thyroid surgery than younger individuals

BACKGROUND

Thyroid nodules, both benign and cancerous, are more common in older people. Patients who have thyroid surgery can have complications, such as damage to the vocal cords, low calcium levels, infection and longer lengths of stay in the hospital after surgery. Studies done in the past have tried to figure out if older people who have thyroid surgery are more likely than younger people to suffer those complications but the results were mixed. Some studies showed more complications and some reported no difference.

This study tries to determine if there is a difference in complications of thyroid surgery between patients in their 80s (octogenarians) and younger patients

THE FULL ARTICLE TITLE

Sakowitz S et al 2023 Thyroid surgery outcomes in octogenarians: A national analysis. Surgery. Epub 2023 Apr 11. PMID: 37055292

SUMMARY OF THE STUDY

The authors studied about 120,000 patients older than 55 who had thyroid surgery in the hospital between 2010 and 2020. The patients were divided in two groups: older than 80 years old and and younger than 80 years old. Almost 8% of the patients were older than 80 years old. The authors took into account other medical problems the patients may have had before the surgery and how frail they were. They looked at complications after the surgery, medical expenses, death, how long they stayed in the hospital and chances of being readmitted within 30 days after having left the hospital.

The death rate was 0.2% or 2 patients for every 1000 patients. The group of patients over 80 years old, as expected, had more medical conditions prior to the surgery and also higher rates of complications after the surgery (31 % for the older group and 22% for the younger group), including about twice the rate of vocal cord injury (resulting in voice problems) and readmissions. The older group was about 6 times more likely to die in the hospital. They also were more likely to have strokes, respiratory and kidney problems than patients in the younger group. Their stay in the hospital was longer and the hospital costs were higher for this older group of patients. Even for those patients that had same day surgery the complications were higher for the older group (infection and local bleeding).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The good news about this study is that dying after thyroid surgery was very low for all patients. But it also showed that patients older than 80 undergoing thyroid surgery were more likely to have medical complications, death, longer stay in the hospital and higher costs. The decision to recommend thyroid surgery to older patients should be individualized and patients should be informed about their risks.

— Susana Ebner MD

ATA RESOURCES

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

THYROID SURGERY, continued

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*.

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THYROID NODULES

Possible age cutoff may predict growth of small, suspicious appearing thyroid nodules.

BACKGROUND

Detection of thyroid cancer has been increasing over the past several decades. A lot of these cancers are microcancers, meaning that they are <1 cm. These microcancers are low risk for spreading outside the thyroid and have not changed the death rate from thyroid cancer, which is very low. Indeed, monitoring these small cancers by ultrasound instead of pursuing surgery, called active surveillance, has become an accepted treatment option. Many of these microcancers are detected after biopsy small thyroid nodules, also <1 cm, that have suspicious features on ultrasound. In general, active surveillance for nodules <1 cm is usually recommended by guidelines, even if these nodules have suspicious features on ultrasound. Biopsy is then recommended only of there is significant growth of the nodule.

This study was done to determine if there is a specific age cutoff that would help predict the risk of significant growth of small suspicious nodules and that can help us advise patients regarding this likelihood and their options.

THE FULL ARTICLE TITLE

Zhuge, L et al 2023. The optimal age threshold for stratifying the risks of disease progression in patients with highly suspicious sub-centimeter thyroid nodules. Ann Surg Oncol **30:**5463–5469. PMID: 37061650.

SUMMARY OF THE STUDY

This study was performed in China and looked at 779 adults with highly suspicious thyroid nodules <1 cm. They excluded any patients that had any aggressive finding on ultrasound (extension beyond the thyroid, involvement of nearby lymph nodes, or dangerous location in the neck). They defined significant growth as enlargement of the nodule by >50% of volume or >3 mm in diameter or new appearance of highly suspicious nodules/lymph nodes. Ultrasounds were performed 1-2 times a year for up to 7 years (most had a 20 month follow up).

Results of the study showed that approximately 7% of patients had nodules that significantly grew during the study and the factors that predicted progression was age <30 and having multiple suspicious nodules. For patients > 30, having multiple suspicious nodules and the presence of thyroiditis were related to significant growth of the nodules.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Although there were a small number of patients less than 30 years old in the study, this study suggests that small suspicious nodules in younger patients (<30 years old) should be biopsied, as they seem to be more likely to have significant growth. However, this study also shows that very few small (<1 cm) thyroid nodules show significant growth over time in patient >30 years old, even if they have suspicious ultrasound features, and supports the recommendations that these nodules can be followed without biopsy.

This study is important because although we understand that small suspicious thyroid can be monitored with a very low risk of death, the medical community is trying to find ways to predict which groups of patients will have more aggressive disease than others in order to make better, patient specific recommendations.

— Maria Brito, MD

THYROID NODULES, continued

ATA RESOURCES

Thyroid Nodules: https://www.thyroid.org/thyroid-nodules/

Fine Needle Aspiration Biopsy of Thyroid Nodules: https://www.thyroid.org/fna-thyroid-nodules/

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

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.

Thyroid Ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

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).

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.

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THYROID CANCER

One side, both sides, or multiple spots — can we predict the return of thyroid cancer?

BACKGROUND

Papillary thyroid cancer is the most common type of thyroid cancer. Most papillary thyroid cancers are low-risk cancers, meaning low risk for either cancer recurrence or cancer death. Until recently most thyroid cancers were treated with surgery to remove the whole thyroid then sometimes followed with radioactive iodine therapy. However, in most cases, papillary thyroid cancer is not very dangerous and patients do very well even when only the side containing the cancer is removed (lobectomy). Leaving the opposite lobe intact results in fewer side effects of treatment. The concern with this approach is missing small cancer spots in the other half. So, it is important to study how often the cancer comes back after surgery.

This study was done to find out how often there might still be papillary thyroid cancer in the other side of the thyroid when only one lobe was removed. The researchers also wanted to find out which factors make the cancer come back. They were especially looking for the effects of having cancer on both sides of the thyroid (bilateral cancer) or having more than one area of cancer in the same thyroid lobe (multifocal cancer).

THE FULL ARTICLE TITLE

Rodriguez Schaap PM et al 2023 Bilaterality, not multifocality, is an independent risk factor for recurrence in low-risk papillary thyroid cancer. J Natl Cancer Inst. Epub 2023 Jun 2. PMID: 37267155.

SUMMARY OF THE STUDY

The study was done in the Netherlands. Researchers reviewed information about patients who had surgery for low-risk papillary thyroid cancer between 2005 and 2015. They used two large nationwide databases to gather information. They included patients with low-risk papillary thyroid cancer who had part of their thyroid removed and then, within one year, the other part taken out.

Based on the number and location of the lesions patients were divided into 4 groups. Group A had one cancer in the thyroid, Group B had one cancer in the initial lobe and found to have cancer in the opposite lobe after the second surgery, Group C had multiple cancers in the initial lobe and no cancer in the opposite lobe, and Group D had multiple cancer in the initial lobe and multiple cancer in the opposite lobe.

There were 791 patients. Most of them were women (83%) and around 46 years old. Out of these patients, 460 of them had just one cancer spot, 103 had multiple cancers in one lobe of their thyroid, and 228 had cancer on both sides. The likelihood of finding cancer on the opposite side was 24.6% for patients who had one cancer and 43% for patients with multiple cancers in the lobe that was first taken out. The risk of the cancer coming back was 1.5% (7/460) for group A, 7.3% (11/150) for group B, 1.9% (2/103) for group C and 2.6% (2/78) for group D. When they further analyzed these findings, they found that having cancer on both sides of the thyroid was the only factor that made it more likely for the cancer to come back. The risk was 3.6 times higher for these patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that there is a good chance of finding some cancer on the other side of the thyroid especially if there are multiple cancer spots in one lobe. They also concluded that having cancer on both sides of the thyroid is a bigger risk for the cancer coming back than having one cancer spot on one side. Overall, the chances of the cancer coming back is generally low.

For this type of thyroid cancer, a smaller surgery that removes only one side of the thyroid may be as good as a more extensive surgery. Having a smaller surgery and

THYROID CANCER, continued

closely watching the other side of the thyroid may be a better option for some patients. The findings of this study can help us choose which patients would benefit from this approach. We still need more studies to better understand thyroid cancer and make safer treatment decisions.

— Ebru Sulanc, MD

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).

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 lobectomy*.

Completion thyroidectomy: surgery to remove the remaining thyroid lobe in thyroid cancer patients who initially had a lobectomy.

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THYROID CANCER

Tear duct and salivary gland problems following radioactive iodine therapy for thyroid cancer

BACKGROUND

Papillary and follicular cancers make up roughly 90% of thyroid cancer cases. The primary treatment is surgery. In cases of more advanced disease, radioactive iodine therapy is given after surgery. This works because thyroid cells, including cancerous ones, possess a unique ability to take up, concentrate and utilize iodine to make the thyroid hormones. During radioactive iodine therapy, the radioactive iodine selectively targets and destroys any thyroid cancer cells that may remain after surgery. Tear duct and salivary glands can also take up radioactive iodine but not concentrate it. However, this exposure to radioactive iodine can cause inflammation, blockages, and a range of symptoms, including pain, dry mouth, dry eyes, mouth infections, taste disturbances, and digestion issues. While these side effects are well described, few studies in the medical literature examine the truel rate of tear duct and salivary complications after radioactive iodine therapy.

In this study, the authors of the current study set out to investigate whether a) radioactive iodine truly causes tear duct and salivary gland problems, b) the relationship between the dose of radiation and symptoms, and c) the patient factors that may predict the likelihood of developing problems six months after radioactive iodine therapy.

THE FULL ARTICLE TITLE

Baudin C et al 2023 . Dysfunction of the salivary and lacrimal glands after radioiodine therapy for thyroid cancer: Results of the START study after 6-months of follow-up. Thyroid. Epub 2023 Jun 23.

SUMMARY OF THE STUDY

The researchers studied 136 patients with thyroid cancer awaiting radioactive iodine therapy in 2020 at the St Pitié-Salpêtrière Hospital in France. Patients were grouped according to the dose of radioactive iodine that they received as low dose (44 patients) vs. high dose (92 patients). Subjects were then followed for 6 months after their radioactive iodine therapy. Researchers used validated questionaires asking patients about symptoms such as dry eyes and dry mouth to assess for tear duct and salivary gland problems. They also analyszed saliva and tear samples from patients. Finally they used a technique called dosimetry to estimate the actual dose of radiation that the tear duct and salivary gland cells absorbed in each patient. The average age of patients was 47.1 years. The group was 71.3% women, 85% with papillary cancer, 47% with a remaining portion of their thyroid after receiving radioactive iodine therapy, 40% with a history of other medical problems and only 7% had a history of salivary problems prior to therapy.

Overall, there were no significant differences in salivary gland pain or saliva volume between the baseline and 6-month follow-up. However, more patients (22%) reported experiencing dry mouth, and a significant portion (17%) reported dry eye sensation after the therapy. The decrease in saliva flow and the sensation of dry mouth were positively correlated with the radiation dose absorbed by the salivary glands. Similarly, an increased sensation of dry eyes was associated with the dose of radioactive iodine absorbed by the lacrimal glands, but only in the group that received 1.1 GBq of radiation. Finally, patient age, menopausal status, symptoms of depression and anxiety, and a history of other systemic diseases were risk factors for experiencing symptoms related to tear duct and salivary gland problems. Interestingly, individuals who had used painkillers in the past three months had a lower risk of problems.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study provides new knowledge on the impact of radioactive iodine exposure on the teat duct and salivary glands. Although the study was small in size and only only 6 months long, the findings suggest that, while radioactive iodine may lead to certain symptoms of tear duct and salivary gland dysfunction, it does not appear to result in severe, long-lasting effects.

— Philip Segal, MD

THYROID CANCER, continued

ATA RESOURCES

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

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

ABBREVIATIONS & DEFINITIONS

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

Tear duct glands: these glands make tears that lubricate the eyes

Salivary glands: these glands produce saliva in the mouth

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THYROID FUNCTION TESTS

The impact of nutritional support in the low T3 syndrome

BACKGROUND

The main thyroid hormone secreted by the thyroid is thyroxine, also known as T4. T4 is converted to T3, the active thyroid hormone, outside of the thyroid in tissues where thyroid hormone acts. Conversion of T4 to T3 is tightly regulated. During severe illness, conversion of T4 to T3 is downregulated, leading to low T3 levels. This helps conserve energy for the body to fight the severe illness. This is called the "low T3 syndrome" and is often seen in patients admitted to the hospital. Fasting and/or starvation can also cause the low T3 syndrome, especially in patients admitted to the hospital. There are studies that show that nutritional support in the hospital can decrease the likelihood of developing the low T3 syndrome.

This study investigated the role of the low T3 syndrome on clinical outcomes and response to nutritional support in patients admitted in the hospital.

THE FULL ARTICLE TITLE

Müller NA et al 2023 Low T3 syndrome on admission and response to nutritional support in malnourished medical inpatients. J Clin Endocrinol Metab **108:**e240–e248. PMID: 36546619.

SUMMARY OF THE STUDY

This is an analysis of the Effect of Early Nutritional Support on Frailty, Functional Outcomes, and Recovery of Malnourished Medical Inpatients Trial (EFFORT), a trial of nutritional support in eight Swiss medical centers. In this analysis, adult inpatients with available free serum T3 levels (FT3) from the time of admission were included. Those included were malnourished, defined as ≥3 points in the Nutritional Risk Screening 2002 (NRS-2002) score, and had an expected length of hospital stay of ≥4 days. Patients were divided into 2 populations based on FT3 levels: normal FT3 and "low T3 syndrome," defined as FT3 <3.2 pmol/L (lower reference limit). Mortality (as assessed at 30 days, 180 days, and 5 years) was the primary end point. One group of patients received personalized nutritional support, supervised by a dietitian who composed an individual nutritional plan within 48 hours after hospital admission nwhile the other group received usual hospital care.

Serum FT3 concentrations were available for 801 of 2028 patients (39.5%). The average age of the 801 patients was 73.3 years, and 46.7% were female. Of these 801 patients, 492 (61.4%) had low T3 syndrome. Compared to those with normal FT3 levels, the patients with low T3 syndrome were older (71.5 years vs. 74.5 years) and had higher nutritional risk. Low T3 syndrome was associated with higher mortality at 30 days (~97% increased risk), 180 days (~39% increased risk) and 5 years (~26% increased risk). As compared with the usual hospital diet, the nutritional support intervention lowered mortality in the group of patients with low T3 syndrome by ~18%, althought this did not reach statistical significance.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study confirmed that inpatients with malnutrition that also have the low T3 syndrome are at increased risk of death. Further, these data suggest that nutritional support interventions can decrease the risk of death in these patients.

— Alan P. Farwell, MD

ATA RESOURCES

Thyroid Function Tests: https://www.thyroid.org/thyroid-function-tests/

THYROID FUNCTION TESTS, continued

ABBREVIATIONS & DEFINITIONS

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

Triiodothyronine (T3): the active thyroid hormone, usually produced from thyroxine.

Low T3 syndrome: during severe illness, conversion of T4 to T3 is downregulated, leading to low T3 levels to help conserve energy for the body to fight the severe illness. This can also be seen in starvation and malnutrition and in chronic illnesses such as heart failure

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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.

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Graves' Disease & Thyroid Foundation

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

Light of Life Foundation
checkyourneck.com

BITE ME CANCER!

MCT8 - AHDS Foundation

THYROID CANCER ALLIANCE

Thyroid Cancer Canada
Cancer de la thyroïde Canada

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
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Thyroid Cancer Alliance
www.thyroidcanceralliance.org
www.thyroidcancerpatientinfo.org
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