Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

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 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.

July is Graves' Disease Awareness Month.

In this issue, the studies ask the following questions:

- Is surgery more cost-effective than radioactive iodine therapy as an alternative to antithyroid medication in the management of Graves' disease?
- Is there an association between subclinical hypothyroidism and renal function?
- Is there a difference in surgery for thyroid cancer between country and urban settings?
- Do all large thyroid cancers need a total thyroidectomy?
- Is thyroid cancer in children different than in adults?
- Are "Smart medicines" helpful for treatment of advanced thyroid cancers?

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

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

HYPERTHYROIDISM

Is surgery more cost-effective than radioactive iodine therapy as an alternative to antithyroid medication in the management of Graves' disease?

BACKGROUND

Graves' disease is the most common cause of hyperthyroidism. Graves' disease is often treated with antithyroid medications at first, with the most common antithyroid medication being methimazole. Antithyroid medications can be used until the Graves' disease goes into remission. However, once antithyroid medications are stopped, about half of the patients become hyperthyroid again after a period of time. So, in order to permanently treat Graves' disease, definitive treatments are often offered to those patients who relapsed or at a high risk for relapse. The two definitive treatments available include radioactive iodine therapy and surgery. Radioactive iodine therapy is given as a capsule by mouth and the radioactive iodine is taken up by the thyroid cells and are destroyed. Surgery involves removal of the thyroid (total thyroidectomy). Both radioactive iodine therapy and surgery result in making the patient's hypothyroid. This study was done to compare the cost-effectiveness of surgery as compared to radioactive iodine therapy.

THE FULL ARTICLE

Ma EZ et al 2023 Total thyroidectomy is more cost-effective than radioactive iodine as an alternative to antithyroid medication for Graves' disease. Surgery 173:193–200. PMID: 36208983.

SUMMARY OF THE STUDY

The authors created a model to estimate what the total cost would be if a patient with Graves' disease were to receive surgery or radioactive iodine therapy. In calculating the costs of each treatment, they included the costs of possible complications and quality of life measures assigning them a value.

Their model showed that total thyroidectomy was a more cost-effective treatment option for the majority of patients with Graves' disease, even though it was more expensive than radioactive iodine therapy. This is because patients who had surgery have improved quality of life over time as compared to patients who had radioactive iodine therapy, which outweighs the lower costs of radioactive iodine therapy. Even for older patients, surgery remained more cost-effective according to this study.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study found that, although surgery is more costly upfront as compared to radioactive iodine therapy, it provided the patients a better quality of life over time. This study, however did not compare surgery with long term use of antithyroid drugs, which is now becoming a more acceptable treatment option to endocrinologists and patients. For now, after a thorough discussion with their physicians, patients' preferences and their specific clinical situation should guide treatment choices for Graves' disease in this age of personalized medicine.

— Susana Ebner MD

ATA RESOURCES

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

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

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

HYPERTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

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

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

Total thyroidectomy: surgery to remove the entire thyroid gland.

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
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

HYPOTHYROIDISM

Associations between subclinical hypothyroidism and renal function

BACKGROUND

Hypothyroidism is common and can affect all aspects of the body's functioning. Most hypothyroidism is overt, meaning that the TSH is high and the FT4 level is low. Overt hypothyroidism is almost always treated. Subclinical/mild hypothyroidism is seen where the FT4 is normal and the TSH is high and the benefits of treatment are much less clear. It is well-recognized that overt hypothyroidism is one risk factor for kidney problems. At the same time, the kidney contributes to the regulation of thyroid hormone levels by producing enzymes that convert T4 to the active hormone T3 and by eliminating the thyroid hormones from the body through the urine. The relationship between subclinical hypothyroidism and kidney function has been studied with unclear results.

This large population study evaluated the risk of subclinical hypothyroidism on the development of chronic kidney disease (CKD).

THE FULL ARTICLE TITLE

Kim HJ et al 2023 Subclinical thyroid dysfunction and chronic kidney disease: A nationwide population-based study. BMC Nephrol 24:64. PMID: 36949396.

SUMMARY OF THE STUDY

The Korea National Health and Nutrition Examination Survey (KNHANES; a nationwide, cross-sectional survey) VI (2013–2014) data was analyzed for this study. Included in the analysis were 3257 adult participants who underwent both thyroid and kidney function tests. The participants had normal FT4 levels, no history of thyroid disease, no other chronic diseases and were not on any medications that could influence thyroid function. CKD was defined as a decreased estimated glomerular filtration rate, the main measurement of kidney function.

Of the 3257 participants, 54.1% were men with an average age of 44.1 years and 6.7% had CKD. Participants with CKD were significantly older (average age, 54.7 vs. 43.3 years), had relatively lower income/education and higher measurements of body-mass indexes, systolic and diastolic blood pressures, total cholesterol, triglycerides and fasting glucose. Comparing the entire group participants, there was no difference in serum TSH levels. However, examining the group of individuals with subclinical hypothyroidism demonstrated a ~2-fold greater risk of CKD than those with normal TSH levels. Even with adjustments made for multiple variables including sex, age, household income, education, smoking, alcohol use, walking activity, obesity, high blood pressure and diabetes, individuals with subclinical hypothyroidism continued to have a >2-fold risk factor for CKD.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This broad, population-based survey from South Korea suggests that subclinical hypothyroidism independently predicted and was associated with increased odds of CKD. What is unclear is whether treatment of subclinical hypothyroidism affected this risk and should be the basis of future studies. However, this data shows that it is important to follow kidney function in patients with subclinical hypothyroidism.

— Alan P. Farwell, MD

ATA RESOURCES

Hypothyroidism (Underactive): https://www.thyroid.org/hypothyroidism/

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

HYPOTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

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.

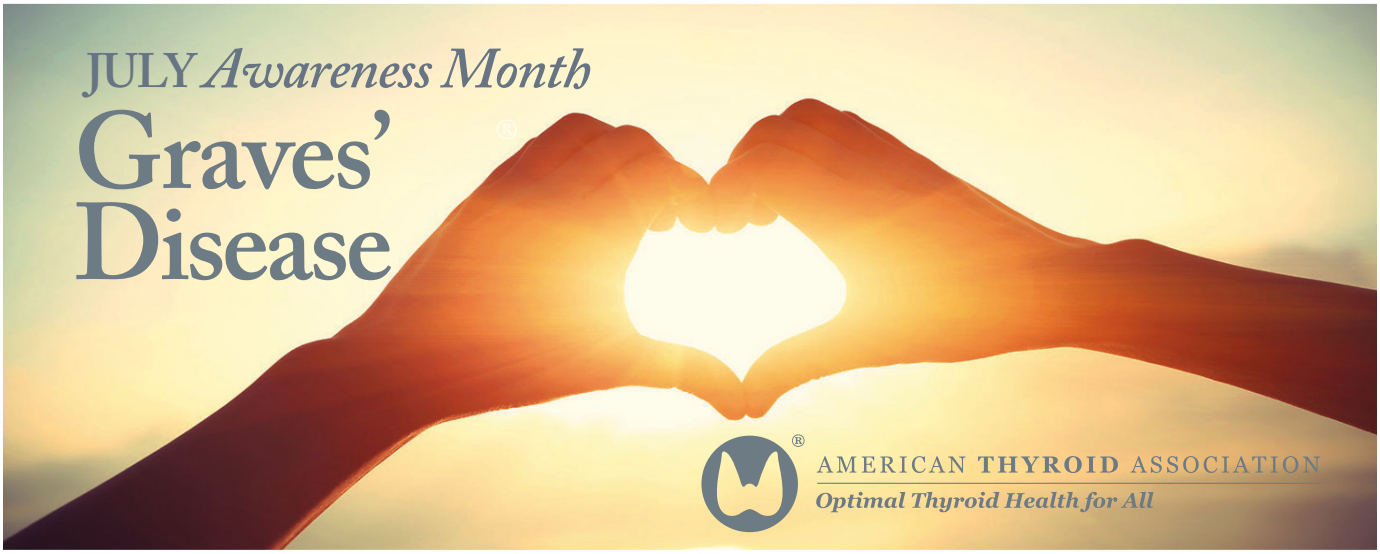
TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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.

Body-mass index (BMI): a standardized measure of obesity calculated by dividing the weight in kilograms by the square of the height. A normal BMI is 18.5-24.9, overweight is 25-30 and obese is >30.

Chronic Kidney Disease (CKD): this occurs when kidneys are damaged and lose their ability to filter waste and fluid out of the blood. Waste can build up in the body and harm overall health. CKD is diagnosed with a decreased estimated glomerular filtration rate, which is a main measurement of kidney function.



AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

THYROID CANCER

Extent of surgery for papillary thyroid cancer differs between country and urban settings

BACKGROUND

In 2015, the American Thyroid Association (ATA) issued updated guidelines for the treatment of thyroid cancer. Previous ATA guidelines favored removal of the all the thyroid (total thyroidectomy) for most papillary thyroid cancers greater than 1 cm in diameter. Now, the 2015 guidelines are much more flexible as they recommend removal of only the lobe containing the nodule (lobectomy) in addition to total thyroidectomy as options for surgery if the cancer is between 1-4 cm and limited to one lobe with no evidence of spread of the cancer to the lymph nodes in the neck. This has led to a significant increase in lobectomies being performed, especially in hospitals associated with medical centers associated with medical schools. Most medical centers associated with medical schools are located in or near cities (urban settings) while most hospitals in rural/country settings are located far away from medical schools.

This study looked to see whether there was a difference in extent of surgery between rural/country and urban settings in the United States and whether the 2015 guidelines changed any differences seen.

THE FULL ARTICLE TITLE

Collins R et al 2023 Urban and rural surgical practice patterns for papillary thyroid carcinoma. Thyroid.. Epub 2023 Apr 4. PMID: 37014086.

SUMMARY OF THE STUDY

The authors used a cancer data base called the U.S. Surveillance, Epidemiology, and End Results (SEER) and analyzed data from 2004 to 2019. Place of residence (urban vs. rural/country) was based on the 2013 Rural-Urban Continuum Codes. Data was broken down into two time periods (2004-2015 and 2016-2019) to evaluate the effect of the 2015 guidelines.

The study group was composed of 89,294 patients; 90% were from urban setting and only 10% from rural settings. Overall, prior to the 2015 guidelines, the percent of patients getting a total thyroidectomy were 79.9% and 83.1% for rural and urban settings, respectively. Overall, patients in rural settings were approximately 20% less likely to have total thyroidectomy compared to patients in urban settings. Following the publication of the 2015 guidelines, the percent of patients getting a total thyroidectomy in rural and urban settings were similar (75.5% and 74.3%, respectively) as there was an increase in lobectomies being done in both settings.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Differences in care for rural versus urban patients are well-established and may be driven by many factors including lower income, lack of health insurance, higher unemployment rates and less high volume thyroid surgeons. It is surprising that the rate of lobectomies was higher in rural settings initially, given that patients from rural areas are more likely to present with advanced disease that would usually results in a total thyroidectomy. However, it is after publication of the 2015 guidelines that recommended lobectomy as an option that the proportion of patients undergoing total thyroidectomy is decreasing and is now similar in both rural vs urban settings.

— Marjorie Safran, MD

ATA RESOURCES

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

THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Total thyroidectomy: surgery to remove the entire thyroid gland.

Lobectomy: surgery to remove one lobe of the thyroid.

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

THYROID CANCER

Large thyroid cancers that do not have high risk features have a low recurrence rate even after only a lobectomy

BACKGROUND

Thyroid cancer is very common and carries an excellent prognosis. This is because we have very effective treatment options and we know more about identifying high risk thyroid cancers so we can target more aggressive treatment. Many thyroid cancers are small (<1-2 cm) and often are treated with removal of the lobe containing the cancer (lobectomy). Cancers >4 cm are considered high risk by the major national guidelines including the ATA cancer guidelines. These large cancers are recommended to be treated with a total thyroidectomy initially, with the recommendation of following with radioactive iodine therapy if any additional high risk feature are present. There is a higher risk of cancer recurrence and poorer prognosis associated with larger cancer due to the size, therefore, endocrinologists and surgeons feel hesitant about treating large cancers with lobectomy alone. However, there has been a shift towards more conservative surgical approaches for certain cases of thyroid cancers, particularly those with low-risk features.

This study was done to understand the clinical course and best management of large thyroid cancers. The goal was to investigate the extent of surgery needed for large thyroid cancers that do not exhibit other high risk features other than size.

THE FULL ARTICLE TITLE

Ghossein R et al 2023 Large (>4 cm) intrathyroidal encapsulated well-differentiated follicular cell-derived carcinoma without vascular invasion may have negligible risk of recurrence even when treated with lobectomy alone. Thyroid. Epub 2023 Mar 8. PMID: 36884299.

SUMMARY OF THE STUDY

This study was conducted at Memorial Sloan Kettering Cancer Center (MSKCC, New York, NY) and recruited 88 patients between 1995 and 2001. They included patients with thyroid cancers >4 cm with no other high risk features. Only patients that had been followed up for a year or longer were considered. Some of the other parameters recorded were sex, age at diagnosis, surgery (lobectomy or total thyroidectomy), lymph nodes sampled and postoperative radioactive iodine therapy.

There was a slight female predominance observed (female to male ratio of 1.2:1) with the average age of diagnosis of 51 years. Overall, 70% of the cancers were papillary thyroid cancer, 21% of the cases were follicular thyroid cancer and 9% were oncocytic thyroid cancer. The average cancer size was 5 cm. In total, 36% of patients received a lobectomy while the rest underwent a total thyroidectomy. The average period of follow-up was 4.8 years. Lymph nodes were examined in 44% of cases and 5 of 20 cases (25%) showed spread of the thyroid cancer to the lymph nodes. All 5 of these cases underwent total thyroidectomy.

The total thyroidectomy group was more likely to have postop radioactive iodine therapy although only 34 patients received this, and they had longer follow-up. However, no difference was observed between both the groups in terms of pathological features. There was no cancer recurrence or cancer-related death noted in the entire group.

WHAT ARE THE IMPLICATIONS OF THE STUDY?

The study makes a case for more conservative surgical management options such as lobectomy/ partial thyroidectomy in cases of large (>4 cm) cancers that have no other high risk features. The risk of recurrence or cancer-related death in these cases no different than in patients with more aggressive treatment, although this is a small study. This is an important study that shows additional surgical options for these patients.

— Sargun Singh, MD and Maria Brito, MD

THYROID CANCER, continued

ATA RESOURCES

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

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

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

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*.

Total thyroidectomy: surgery to remove the entire thyroid gland.

Near-total thyroidectomy: removal of nearly all of each thyroid lobe, leaving only a small portion of the thyroid gland.

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*).

Lobectomy: surgery to remove one lobe of the thyroid.

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.

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

THYROID CANCER

Understanding childhood thyroid cancer and how children are unique

BACKGROUND

Thyroid cancer in children is different than in grown-ups. When children have thyroid cancer, the cancer is often at an advanced stage and has spread more throughout the body compared to adults. In adults, advanced stage thyroid cancer means there is an increased risk of the cancer coming back after treatment. The good news is that children with thyroid cancer usually get better regardless of the stage at presentation and have a very low chance of dying from it. Overall, the prognosis for patients with thyroid cancer is excellent in all patients but is better in children than in adults.

Because of these differences, it is important to study thyroid cancer in children separately from adults. The information we learn about thyroid cancer in adults may not be true for children and may result in giving too much treatment. For example, radioactive iodine therapy used as a treatment for thyroid cancer may have a higher risk at causing future health problems in children than in adults, like getting another type of cancer much later.

This study was done to better understand how thyroid cancer behaves in children and to figure out which factors could cause bad outcomes.

THE FULL ARTICLE TITLE

Review of: Saliba M et al 2022 Clinicopathologic and prognostic features of pediatric follicular cell-derived thyroid carcinomas: A retrospective study of 222 patients. Am J Surg Pathol 46:1659–1669. PMID: 36040037.

SUMMARY OF THE STUDY

The researchers looked at information from a group of 222 patients who were diagnosed with thyroid cancer before the age of 21 and treated at Memorial Sloan Kettering Cancer Center from 1994 to 2018. They collected data about their surgeries, like how much of the thyroid gland was removed and if lymph nodes were checked. They also studied specific things about the cancers, like their size, where they were located, how they looked under the microscope, if they had spread to lymph nodes or other parts of the body. They classified the cancers using the World Health Organization guidelines but there were also a few types described in a newer system. They wanted to understand which factors were related to a higher risk of the cancer coming back or spreading. They also looked at factors like the patients' age, gender, stage of the cancer, and outcome of the treatment. The main thing they wanted to know was how long the patients remained cancer-free after having their thyroid removed. The researchers also wanted to learn if the cancer came back in the same area, or if it spread to other parts of the body.

Thyroid cancer was more common in girls (78%). Age did not affect how serious the cancer was. Most of the group (79%) had papillary thyroid carcinoma (PTC). In almost two thirds of the patients, the cancer had spread to nearby lymph nodes. This was more common in boys and in cancer larger than 4 cm. Cancer that was surrounded by a protective layer was less likely to invade lymph nodes. A total of 14 patients (6%) had cancer that had spread to other parts of the body at the time of diagnosis. They found that a type of papillary thyroid cancer called tall cell variant behaves much less aggressively in children compared to adults. While this is an aggressive type in adults, in children it behaved similar to low-risk papillary thyroid cancer. They found that two subtypes of thyroid cancer had worse outcomes. The diffuse sclerosing variant of papillary thyroid cancer and high-grade follicular cell thyroid carcinoma with necrosis (cell death) were more serious and had a very high chance of spreading to lymph nodes.

Overall, being a boy, having a high-risk type of cancer, having a cancer larger than 4 cm, having cancer outside of the thyroid, having cancer cells at the edges of the removed tissue, and having necrosis in the cancer were associated with worse outcomes.

THYROID CANCER, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Based on the findings, the researchers suggested that the classification of high-risk thyroid cancers in children should be based on specific criteria, mainly cancer necrosis (dead tissue) and certain subtypes of the cancer. They also point out that more research on the genes and characteristics of the cancer could help us better understand the disease.

In conclusion, this study gives us valuable information about how thyroid cancer behaves in children and how it differs from the thyroid cancer in adults. It shows that we should think about thyroid cancer in children differently and not use information from studies of adults with thyroid cancer. It also reminds how important it is to have accurate ways of classifying the type of cancer a child has in order to plan the best treatment for them.

— 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).

Follicular variant of papillary thyroid cancer: one of the subtypes of papillary thyroid carcinoma, which has been classified to three different forms: non-invasive follicular thyroid neoplasm with papillary-like nuclear features, invasive encapsulated and infiltrative FVPTC

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*.

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
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

Clinical Thyroidology® for the Public

THYROID CANCER

"Smart medicines" for advanced thyroid cancers

BACKGROUND

Thyroid cells are the only cells in the body that take up and concentrate iodine. Iodine is used to make the thyroid hormones. This feature is used to treat advanced thyroid cancer by using radioactive iodine therapy. The radioactive iodine is taken up by normal and cancerous thyroid cells and destroys them. While most thyroid cancer has an excellent prognosis, some advanced thyroid cancers can be very difficult to treat. A common reason for this is that some advanced cancer cells lose the ability to take up and concentrate the radioactive iodine.

In the past decade, there have been oral "smart medicines" developed aimed at restoring the thyroid cancer cells ability to take up iodine with mixed success. In recent years, physicians have started looking at the genetic make-up of a particular thyroid cancer on a surgical specimen to find a gene mutation that can act as a target for therapy. These genetic mutations might be able to guide physicians as to the specific type of "smart medicine" which will change the non-responsive, very altered thyroid cancer cell closer to its more natural thyroid cell form that did concentrate iodine well. As thyroid cancers respond less and less to radioactive iodine, they get more active and start showing up more and more on PET-CT scans, which measure how active the cells are. This shows that the cancer is getting worse.

The goal of the study is to assess the ability of "smart medicines" known as tyrosine kinase inhibitors to bring thyroid cancer cells closer to their more natural form of the thyroid cell to make radioactive iodine more effective.

THE FULL ARTICLE TITLE

Weber M et al 2022 Enhancing radioiodine incorporation into radioiodine-refractory thyroid cancer with MAPK inhibition (ERRITI): A single-center prospective two-arm study. Clin Cancer Res 28:4194–4202. PMID: 35594174.

SUMMARY OF THE STUDY

The study analyzed 20 patients at the University of Duisburg-Essen Hospital in Germany who had structural evidence of thyroid cancer that could not be completely removed or had thyroid cancer that had changed so much that they are no longer responding to radioactive iodine treatments. A PET-CT scan was used both before the treatment with these "smart medicines" and after to assess how much more the thyroid cancer cells were able to take up iodine compared to the original thyroid cell. To qualify for the study, each of the patients' surgical pathology was evaluated for whether the thyroid cancer contained a mutation of the BRAF V600E gene mutation common in thyroid cancer. Patients with a mutated version were treated with two "smart medicines" dabrafenib and trametinib, while patients without the gene mutation were treated with only dabrafenib for three weeks.

The PET-CT scan performed after 3 weeks of treatment with either the one or two of the "smart medicines" showed that 7 patients' cancers (35% of the 20 patients studied) were less active and able to respond better to standard radioactive iodine therapy. These cancers were subsequently were treated with high dose (300 mCi) radioactive iodine therapy. After the "smart medicines" treatment and radioactive iodine, 4 out of these 7 patients showed a response with a decrease in blood thyroglobulin levels. The size of the thyroid cancer lesions slightly decreased in 6 out of the 7 patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that in some patients with persistent advanced thyroid cancer that no longer responds to radioactive iodine therapy, treatment with certain novel "smart medicines" can be used to make the cancer more responsive to radioactive iodine therapy. Whether this has any effect on long term prognosis and survival is unclear. However, this provides some hope to thyroid cancer patients for treatment of these advanced thyroid cancers. Over all, this study provides patients and physicians more tools to treat advanced thyroid cancers.

— Pinar Smith, MD

THYROID CANCER, continued

ATA RESOURCES

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

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

ABBREVIATIONS & DEFINITIONS

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.

Mutation: A permanent change in one of the genes.

BRAF gene: this is gene that codes for a protein that is involved in a signaling pathway and is important for cell growth. Mutations in the *BRAF* gene in adults appear to cause cancer.

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*).

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.

Positron-Emission-Tomography (PET-CT) scans: a nuclear medicine imaging test that uses a small amount of radiolabeled glucose to identify cancer. Since cancer cells are more active than normal cells, the cancer cells take up more of the radiolabeled glucose and show up on the PET scan. PET scans are combined with CT scans to accurately identify where the cancer is located.

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.

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

Volume 16 | Issue 7 | July 2023

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

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
(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

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.

Become a Friend of the ATA!
Subscribe to *Friends of the ATA e-news*

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