CLINICAL THYROIDOLOGY FOR PATIENTS

AMERICAN THYROID ASSOCIATION
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CLINICAL THYROIDOLOGY **FOR PATIENTS**
A publication of the American Thyroid Association
VOLUME 3 • ISSUE 6 • JUNE 2010

EDITOR'S COMMENTS

Welcome to *Clinical Thyroidology for Patients*. This publication is a collection of summaries of the top articles from the recent medical literature that cover the broad spectrum of thyroid disorders. *Clinical Thyroidology for Patients* is published on a monthly basis and includes summaries of research studies that were discussed in the previous month's issue of *Clinical Thyroidology*, a publication of the American Thyroid Association for physicians. This means that you, the patients, are getting the latest information on thyroid research and treatment almost as soon as your physicians. The Calendar of Events highlights educational forums and support groups that are organized around the country by members of the Alliance for Thyroid Patient Education. The Alliance member groups consist of: the *American Thyroid Association*, the *Graves' Disease Foundation*, the *Light of Life Foundation* and *ThyCa: Thyroid Cancer Survivors Association*.

Please see the important message regarding Thyrogen, a drug frequently used in the management of thyroid cancer (page 3).

In this issue, studies ask the following questions:

- What are the predictors of thyroid cancer in patients undergoing thyroid fine needle aspiration biopsy?
- Do older patients with hyperthyroidism have the same symptoms as younger patients?
- Are new anticancer drugs effective against progressive metastatic thyroid cancer?
- Is it better to extensively remove lymph nodes during the first surgery for thyroid cancer or wait until the cancer returns?
- Does rhTSH preparation change the exposure of radioactive iodine to body tissues outside of the thyroid?

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

HOW TO NAVIGATE THIS DOCUMENT: The Table of Contents and the Bookmarks are linked to the articles. To navigate, move your cursor over the article title you wish to see (either in the Contents or in the Bookmarks panel) and the hand will show a pointing finger, indicating a link. Left-click the title and the article will instantly appear. To return to the Contents, move the cursor to the bottom of the page and left-click Back to Table of Contents.

A Message to Patients Regarding Thyrogen

WHAT IS THYROGEN?

Thyrogen (recombinant human thyrotropin, rhTSH) is human TSH that is produced in the laboratory and used to produce high levels of TSH in patients after an intramuscular injection. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan and/or stimulated serum thyroglobulin test.

WHAT HAPPENED

On May 24, 2010, Genzyme Corporation, which manufactures Thyrogen, entered into a Consent Decree of Permanent Injunction with the United States Food and Drug Administration (FDA) to resolve litigation in which the FDA has alleged that Genzyme manufactured, labeled and distributed drugs (Cerezyme, Fabrazyme and Thyrogen) at its Allston, Massachusetts facility in violation of current good manufacturing practice requirements for drugs. Genzyme has agreed to correct manufacturing quality violations and will turn over to the federal government $175 million in profits from the sale of products made at the plant. To date, these violations have not been associated with reports of adverse events in patients.

The consent decree requires Genzyme to move operations out of the Allston plant, which may result in restricted availability of these drugs. The consent decree is designed to permit Genzyme to provide for the United States market enough Thyrogen to meet the needs of patients for whom FDA considers the drug to be medically necessary. This restriction will remain in place until Genzyme transfers manufacturing operations to other manufacturing facilities operating in compliance with FDA regulations. This decree does not affect the availability of Thyrogen outside of the US.

While the FDA has developed a set of criteria to help healthcare professionals identify patients for whom Thyrogen is considered medically necessary, physicians are not being required to individually certify medical necessity. It is expected that if your physician determines that Thyrogen is indicated for the management of your thyroid cancer, then it will be available for your use.

WHAT THIS MEANS FOR PATIENTS

Before Thyrogen was available, all thyroid cancer patients that were treated with radioactive iodine or were undergoing diagnostic scanning/testing had to do so after thyroid hormone withdrawal (stopping thyroid hormone and becoming hypothyroid for a short time). Thyroid hormone withdrawal is still indicated in certain situations. However, Thyrogen offers the option for many thyroid cancer patients to undergo these procedures while staying on their thyroid hormone pills. Because of Genzyme's agreement with the FDA, it is expected that Thyrogen will become less available than in the past, and some physicians may opt to stop using Thyrogen altogether until the FDA lifts the decree. You should discuss these options with your physician if you require either radioactive iodine treatment or diagnostic testing for your thyroid cancer.

Most importantly, there has not been any report of a patient having an unexpected adverse reaction to Thyrogen based on the manufacturing problems. We will keep you updated on this issue as it continues to evolve in the coming months.

— Alan P. Farwell, MD

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THYROID CANCER

Thyroid cancer diagnosed by fine needle aspiration biopsy is associated with younger age, male gender and solitary nodules

WHAT IS THE STUDY ABOUT?

Thyroid nodules are very common and can be found in up to 50% of the population. The possibility that a nodule contains a thyroid cancer is 5-8%. Most thyroid cancers are discovered by fine needle aspiration biopsy (FNAB) of thyroid nodules. While FNAB is a very accurate test, there are occasional cancers that are missed with the initial biopsy cytology reading. Further, FNAB cannot diagnose follicular or hurtle cell cancer; it can only state that the results are indeterminate or non-diagnostic. Up to 20-25% of FNABs are reported as being indeterminate or non-diagnostic. When these nodules are removed, only 15-20% are cancerous and the rest are noncancerous follicular or hurtle cell adenomas. This means that many patients are operated on for non-cancerous thyroid nodules. A lot of research has been done in trying to do a better job in diagnosing all thyroid cancers with FNAB. This study sought to evaluate potential risk factors for prediction of thyroid cancer in thyroid FNAB samples.

THE FULL ARTICLE TITLE:

Rago et al. Male sex, single nodularity, and young age are associated with the risk of finding a papillary thyroid cancer on fine-needle aspiration cytology in a large series of patients with nodular thyroid disease. European J. Endocrinology. 2010; 162: 763-770.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to determine clinical risk factors associated with thyroid cancer, specifically papillary thyroid cancer.

WHO WAS STUDIED?

A total of 34,266 patients who underwent FNAB of one or more thyroid nodules in the Department of Endocrinology at the University of Pisa, Italy between 1997 and 2004 were studied.

HOW WAS THE STUDY DONE?

The records of the patients were examined and clinical, radiologic, and laboratory data were analyzed. Thyroid function tests, as well as pathology of the FNAB, were determined and correlations were made with clinical characteristics. Potential clinical risk factors predictive of papillary thyroid cancer on FNAB were determined.

WHAT WERE THE RESULTS OF THE STUDY?

A total of 47,775 nodules in 34,266 subjects were assessed by FNAB. Most of the nodules (74.7%) were benign. A smaller number of nodules were determined to be indeterminate (5.7%) or nondiagnostic (17.1%). Approximately two percent (2.4%) of the nodules were suspicious or consistent with papillary thyroid cancer. All nodules indicative of cancer on FNAB were confirmed on surgical pathology to be cancer, as were >98% of nodules suspicious for cancer on FNAB.

Several clinical characteristics were found to be associated with the diagnosis of papillary thyroid cancer. These clinical features included male gender, presence of a single nodule and age, with papillary thyroid cancer being more common in younger subjects. Further, patients with papillary thyroid cancer had a higher TSH than those with benign thyroid nodules.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

This study is one of the largest series of patients with thyroid nodules in the literature and the results are consistent with previous studies. As with prior studies, this study confirms the overall excellent diagnostic accuracy of the FNAB for assessment of thyroid nodules. The rates of indeterminate or nondiagnostic FNAB results of approximately 20% are also consistent with the published literature on this topic. This study also confirms risk factors thought to be associated with increased risk of thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that male gender, younger age and solitary nodules are more likely to be associated with thyroid cancer. These investigators have developed an

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THYROID CANCER, continued

algorithm for predicting the risk of papillary thyroid cancer in a thyroid nodule when the FNAB does not definitively confirm the diagnosis. This study contributes importantly to our understanding of nodular thyroid disease and prediction of risk for thyroid cancer.

— Whitney Woodmansee, MD

ATA THYROID BROCHURE LINKS

Thyroid Nodules: http://thyroid.org/patients/patient_brochures/nodules.html

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS

Thyroid fine needle aspiration biopsy (FNAB) — a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

Indeterminate thyroid biopsy — this happens usually when the diagnosis is a follicular or hurtle cell lesion. Follicular and hurtle cells are normal cells found in the thyroid. Current analysis of thyroid biopsy results cannot differentiate between follicular or hurtle cell cancer from noncancerous adenomas. This occurs in 15-20% of biopsies and often results in the need for surgery to remove the nodule.

Non-diagnostic thyroid biopsy — this happens when some atypical cells are found but not enough to provide a diagnosis. This occurs in 5-10% of biopsies. This often results in the need to repeat the biopsy.

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.

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HYPERTHYROIDISM

Older patients with hyperthyroidism have fewer symptoms as compared with younger patients

WHAT IS THE STUDY ABOUT?

Thyroid disorders are common in the elderly population. In general, elderly patients have been shown to have less severe signs of hyperthyroidism than younger patients. In fact, the term "apathetic thyrotoxicosis" has been coined to refer to the elderly patient with few, if any, symptoms of hyperthyroidism and appearing more clinically hypothyroid. The aim of this study was to characterize these observations further and to determine the frequency of the signs and symptoms of hyperthyroidism in an elderly population.

THE FULL ARTICLE TITLE:

Boelaert et al. Older subjects with hyperthyroidism present with a paucity of symptoms and signs: a large cross-sectional study. J Clin Endocrinol Metab 2010. jc.2009- 2495 [pii];10.1210/jc.2009-2495 [doi].

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine the frequency of the signs and symptoms of hyperthyroidism in an elderly population.

WHO WAS STUDIED?

The study group included 3409 patients with overt hyperthyroidism (increased T_4 and T_3 levels and suppressed TSH levels) seen at the University Hospital of Birmingham, England, between 1984–2006.

HOW WAS THE STUDY DONE?

Patients were seen at a thyroid clinic at the University Hospital of Birmingham where they were evaluated by a clinician. A questionnaire was given to patients to assess their symptoms of thyroid disease. All patients had a physical exam and a laboratory test of serum free thyroxine (fT_4) was drawn. Patients were divided into quartiles of age at the time of diagnosis of hyperthyroidism: 766 were 16 to 32 years of age, 772 were 33 to 44 years of age, 779 were 45 to 60 years of age and 732 were ≥61 years of age. They were also divided into three groups depending on their diagnosis: (1) Grave's hyperthyroidism, (2) toxic nodular hyperthyroidism or (3) indeterminate (unable to provide accurate diagnosis, but lab and exam consistent with hyperthyroidism).

WHAT WERE THE RESULTS OF THE STUDY?

The most common symptom in all ages was weight loss. Weight loss and shortness of breath were more common in patients >61 years of age and atrial fibrillation was more common in those patients >45 years of age. Symptoms such as heat intolerance, tremor, palpitations and anxiety were less common in patients >61 years of age. The majority of patients older than 61 years of age reported a maximum of two symptoms.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other studies have shown similar findings. A prior study by this group had found that elderly patients have less severe symptoms of Grave's hyperthyroidism. They also found that elderly patients have lower serum T_4 concentrations as compared to younger patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Elderly patients may have fewer signs and symptoms of hyperthyroidism than younger patients. It is important for the clinician to have a lower threshold in ordering thyroid function tests in older patients with atrial fibrillation, shortness of breath or weight loss.

— Heather Hofflich, MD

ATA THYROID BROCHURE LINKS

Graves disease: http://thyroid.org/patients/patient_brochures/graves.html

Hyperthyroidism: http://thyroid.org/patients/patient_brochures/hyperthyroidism.html

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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.

Toxic nodular goiter — 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.

Thyroxine (T_4) — the major hormone secreted by the thyroid gland. Thyroxine is broken down to produce Triiodothyronine which causes most of the effects of the thyroid hormones.

Triiodothyronine (T_3) — the active thyroid hormone, usually produced from thyroxine.

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.

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THYROID CANCER

Sorafenib and Sunitinib are effective in patients with progressive metastatic thyroid cancer

WHAT IS THE STUDY ABOUT?

In general, thyroid cancer grows slowly and is usually responds very well to treatment. Most patients with thyroid cancer can be treated with a combination of surgery, radioactive iodine therapy and thyroid hormone therapy. Unfortunately, some patients are not cured with these treatments and have cancers that spread and continue to grow. Frequently, these cancers no longer take up iodine and, thus, no longer respond to radioactive iodine. In the past, there was little to offer these unfortunate patients as there had been no effective chemotherapy drugs. Recently, research studies have shown that a group of drugs known as tyrosine kinase inhibitors have shown great promise in being effective in the rare patient that has metastatic thyroid cancer that does not respond to radioactive iodine. Two such tyrosine kinase inhibitor drugs that are undergoing clinical trials are Sorafenib and Sunitinib. While clinical trials are the best way to evaluate how effective a new drug is again a disease, not everyone with a disease is available to participate formally. This study examined the response of patients with widespread metastatic thyroid cancer that were treated with Sorafenib and Sunitinib outside of a clinical trial.

THE FULL ARTICLE TITLE:

Cabanillas et al. Treatment with tyrosine kinase inhibitors for patients with differentiated thyroid cancer: the M. D. Anderson experience. J Clin Endocrinol Metab 2010. jc.2009-1923;10.1210.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to determine the response to Sorafenib and Sunitinib in patients with advanced differentiated thyroid cancer that no longer responded to radioactive iodine therapy.

WHO WAS STUDIED?

The study group included a total of 15 patients treated at MD Anderson Cancer Center with advanced differentiated thyroid cancer who had not responded to conventional treatment with surgery, radioiodine and external-beam radiotherapy and who were unable or unwilling to participate in clinical trials.

HOW WAS THE STUDY DONE?

The medical records of all patients with metastatic differentiated thyroid cancer who were treated with Sorafenib and/or Sunitinib outside of a clinical trial between 2006 and 2008, were reviewed and entered into a database. Tumor response was assessed using the Response Evaluation Criteria In Solid Tumors (RECIST). All patients but one were treated twice daily with 400 mg of sorafenib. Dose reductions occurred frequently due to side effects or toxicity. The patients treated with sunitinib received either 50 mg by mouth once daily for 4 weeks, followed by 2 weeks off drug or 50 mg daily for 2 weeks followed by 1 week off the drug.

WHAT WERE THE RESULTS OF THE STUDY?

A total of 33 patients were identified from the database, of which 15 were included in the study. The median age was 61 and 60% of the patients were women, 53% had papillary thyroid cancer, 47% had follicular thyroid cancer and 5% had poorly differentiated cancer. The most common location of metastases (73%) was in the lung, followed by bone (27%), and most patients spread of cancer to more than one site. In all of these patients the cancer was progressively growing and spreading.

Overall, 3 patients (20%) had a partial response, 9 patients (60%) had stable disease and 3 patients (20%) had progressive disease. All together, clinical benefit was seen in 80% of the patients. The response was similar for all types of cancer. Lung metastases responded better than lymph node metastases. The time before the cancers started progressing again was 3 times longer than expected in the 80% that responded to the drugs. However, side effects were common and included diarrhea, hypertension and skin problems.

This study suggests that sorafenib and sunitinib are effective in patients with widely progressive metastatic differentiated thyroid cancer. Most patients achieved stable disease or a partial response despite having progressive disease before drug therapy.

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THYROID CANCER, continued

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Two other studies have also shown that these drugs are effective in treating metastatic thyroid cancer. One study (Kloos et al. *Clinical Thyroidology for Patients* August 2009) showed that 87% of patients responded to Sorafenib for an average of 15 months. Another study showed a 100% response rate to Sorafenib for an average of 21 months.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that tyrosine kinase inhibitors may be a good option for treatment of patients with advanced differentiated thyroid cancer who have failed to respond to more conventional treatment modalities, such as surgery, radioiodine and external radiation.

— M. Regina Castro, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer — the most common type of thyroid cancer

Follicular thyroid cancer — the second most common type of thyroid 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).

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

RECIST: Response Evaluation Criteria in Solid Tumors — this is a set of published rules that define when cancer patients improve ("respond"), stay the same ("stable") or worsen ("progression") during treatments.

Tyrosine kinases — proteins that are overactive in many of the pathways that cause cells to be cancerous.

Sorafenib — an anticancer tyrosine kinase inhibitor drug that has been shown to be effective in thyroid cancer.

Sunitanib — an anticancer tyrosine kinase inhibitor drug that has been shown to be effective in thyroid cancer.

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THYROID CANCER

Thyroid cancer surgeons find comparable results achieved with second operations versus initial operations to remove lymph nodes for papillary thyroid cancer

WHAT IS THE STUDY ABOUT?

A total thyroidectomy is the usual first treatment for papillary thyroid cancer, the most common type of thyroid cancer. Thyroid papillary cancer that extends outside of the thyroid often initially spreads into the neck lymph nodes. Thyroid cancer experts debate how aggressive the initial surgery should be when people are first diagnosed with papillary thyroid cancer. One approach is to remove the thyroid gland and neck lymph nodes located in the center of the neck, even if no obvious cancer is apparent in these lymph nodes (prophylactic central neck lymph node dissection). Another approach is to remove the thyroid gland and only lymph nodes that look like they contain cancer. The American Thyroid Association guidelines recommend routine more extensive surgery for patients with papillary thyroid carcinoma, especially for those with more aggressive cancers. The potential advantage of more extensive initial surgery is decreased return of papillary thyroid cancer and, thus, decreased need for more surgery. The potential disadvantages of more extensive surgery are complications from surgery, such as low calcium levels (hypocalcemia) or hoarseness. This study compared surgeries where the central neck lymph nodes were removed with the initial surgery to those where the central neck lymph nodes were removed in a second surgery after the cancer relapsed. They examined the frequency of the cancer returning and any surgical complications that occurred.

THE FULL ARTICLE TITLE:

Shen et al. Central neck lymph node dissection for papillary thyroid cancer: comparison of complication and recurrence rates in 295 initial dissections and reoperations. Arch Surg 2010;145:272-5.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to compare extensive initial surgery with extensive repeat surgery in terms of how often complications occur and how often thyroid cancer returns.

WHO WAS STUDIED?

The study group included patients who had undergone thyroid surgery at UCSF Mount Zion Medical for papillary thyroid cancer between 1998 and 2007. Patients had undergone 295 surgeries, including 189 (64%) initial operations and 106 (36%) repeat operations. Central neck lymph node removal at the time of initial operations were performed only if enlarged central nodes had been identified. Repeat operations were performed to remove lymph nodes containing papillary thyroid cancer in patients who had undergone prior surgery.

HOW WAS THE STUDY DONE?

The authors reviewed patient records from prior surgeries and assessed how often the papillary thyroid cancer returned in the central neck or in the side of the neck. In addition, they assessed how often complications occurred. The complications studied included neck bleeding, short-term hoarseness, long-term hoarseness (lasting at least 6 months), short-term hypocalcemia and long-term hypocalcemia requiring medication.

WHAT WERE THE RESULTS OF THE STUDY?

Among initial surgeries removing the central neck lymph nodes, 62.4% removed lymph nodes from both sides of the central neck. However, among the reoperative surgeries, 71.7% removed lymph nodes from only one side. Papillary thyroid cancer relapsed at similar rates whether the central lymph nodes were removed at the initial or at a repeat surgery (25.9% initial surgeries compared to 29.2% repeat surgeries). Surprisingly, short-term hypocalcemia occurred more frequently in initial operations compared to repeat operations (41.8% as compared to 23.6%). All other complications were rare (<5%) and there were no differences in the rates between the initial surgery as compared to the repeat surgery.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Like other studies, this study cannot exclude that factors other than the type of surgery, such as underlying aggressiveness of the papillary cancer, contributed to the results. Patients who underwent initial central lymph node

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THYROID CANCER, continued

dissection had more visible progression of disease at time of diagnosis, more extensive initial surgeries and perhaps less use of technology for protection from nerve damage.

Similar to other studies, the rates of complications from more extensive surgeries are higher than seen with total thyroidectomy that does not involve central neck lymph node removal.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study support an approach of performing central lymph node removal at the time of initial papillary thyroid cancer surgery only when abnormal lymph nodes have been diagnosed. In addition, this study emphasizes the need for a definitive, well-designed study to settle uncertainties about best initial surgery for papillary thyroid cancer.

— Ruth Belin, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

Thyroid Surgery: http://thyroid.org/patients/patient_brochures/surgery.html

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer — the most common type of thyroid cancer.

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..

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.

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.

Central neck compartment — the central portion of the neck between the hyoid bone above, and the sternum and collar bones below and laterally limited by the carotid arteries.

Prophylactic central neck dissection — Careful removal of all lymphoid tissue in the central compartment of the neck, even if no obvious tumor is apparent in these lymph nodes

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THYROID CANCER

Radioactive iodine treatment after recombinant TSH is associated with longer retention of the radioactive iodine in the thyroid remnant while reducing exposure to the rest of the body

WHAT IS THE STUDY ABOUT?

After surgery for thyroid cancer, many patients are treated with Radioactive Iodine (I-131). This is to destroy any remaining thyroid cancer cells as well as any remaining normal thyroid tissue (thyroid remnant) to allow monitoring of the thyroid cancer long-term. Recombinant TSH (rTSH) has become a mainstay of diagnosis and treatment of thyroid cancer, allowing doctors to produce a high level of TSH in patients without having to stop the thyroid hormone replacement and producing significant symptoms of hypothyroidism. This is important to stimulate any thyroid cells to take up the Radioactive Iodine and, thus, be destroyed. Questions have been raised whether there are differences in levels of I-131 in various body tissues after rTSH treatment as compared to after thyroid hormone withdrawal. It has been theorized that thyroid hormone withdrawal ought to slow the metabolism of the I-131 in the body but might also slow the clearance of the I-131 from thyroid cancer tissue and possibly making the treatment more effective. In this study, I-131 levels were measured in various tissues of thyroid cancer patients after either TSH preparation or thyroid hormone withdrawal.

THE FULL ARTICLE TITLE

Taïeb et al. Iodine biokinetics and radioiodine exposure after recombinant thyrotropin-associated remnant ablation in comparison with thyroid hormone withdrawal. J Clin Endocrinol Metab 2010. Jc.2009-2528-2528 [pii];101210/jc.2009-2528 [doi].

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to measure I-131 levels in various tissues of thyroid cancer patients after rhTSH preparation or thyroid hormone withdrawal.

WHO WAS STUDIED?

The study group included 88 patients with thyroid cancer at the time of their first treatment with radioactive iodine after surgery a single center in Marseille, France. Patients were randomized to receive either rhTSH (43 patients) or thyroid hormone withdrawal (45 patients).

HOW WAS THE STUDY DONE?

All of the patients went on a low-iodine diet for two weeks before treatment. Patients either received rhTSH injections on consecutive days before receiving the I-131 or were withdrawn for thyroid hormone for 6 weeks after surgery before receiving the I-131. After receiving the I-131, blood and urine samples were collected for several days and radioactivity given off by the I-131 was measured for several days in thyroid remnant tissue in the neck.

WHAT WERE THE RESULTS OF THE STUDY?

The total-body half-life of I-131 was 14.8 h in the rhTSH group as compared to 17.1 h in the thyroid hormone withdrawal group. Thus the overall clearance of I-131 from the body was faster in the rhTSH group than in the thyroid hormone withdrawal group. Surprisingly, the half-life of I-131 in the thyroid remnant tissue was significantly longer after rhTSH (43.5 h) than during thyroid hormone withdrawal (28.7 h).

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other smaller studies had shown that patients treated with I-131 after rhTSH had a lower radiation exposure to the blood as compared to patients treated after thyroid hormone withdrawal. Several other studies have shown that thyroid remnant ablation by radioactive iodine was the same whether the patients received I-131 after rhTSH or after thyroid hormone withdrawal.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Treating thyroid cancer patients with I-131 after rhTSH is associated with longer retention of the I-131 in the thyroid remnant while also reducing exposure to the rest of the body and to the general public who came in contact with patients treated with the radioactive iodine. Thus, not only do patients feel dramatically better after rTSH therapy than with after thyroid hormone withdrawal, they are treated just as effectively while reducing the exposure

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THYROID CANCER, continued

to family members and/or others living with the patient. In countries in which patients are admitted to the hospital for treatment, they should be able to be discharged sooner, thus lowering costs of the hospitalization.

Please see "A Message to Patients Regarding Thyrogen" on page 3 of this issue.

— Henry Fein, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

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).

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

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

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

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.

WHO WE ARE

AMERICAN THYROID ASSOCIATION

www.thyroid.org
ATA Patient Resources: http://www.thyroid.org/patients/
Find a Thyroid Specialist: www.thyroid.org
Phone (toll-free): 1-800-THYROID
e-mail: thyroid@thyroid.org

ATA Mission: The ATA leads in promoting thyroid health and understanding thyroid biology.
ATA Vision: The ATA is the leading organization focused on thyroid biology and the prevention and treatment of thyroid disorders through excellence and innovation in research, clinical care, education, and public health.
ATA Values: The ATA values scientific inquiry, clinical excellence, public service, education, collaboration, and collegiality.

To further our mission, vision and values the ATA sponsors "Friends of the ATA" online to advance the information provided to patients and the public such as this publication, *Clinical Thyroidology for Patients*. We welcome your support.

GRAVES' DISEASE FOUNDATION

www.ngdf.org
Phone (toll-free): 1-877-NGDF-123 or 643-3123
e-mail: Gravesdiseasefd@gmail.com

Founded in 1990, the Graves' Disease Foundation offers support and resources to Graves' disease patients, their families, and health care professionals. Their mission is to find the cause of and the cure for Graves' thyroid disease through research, to improve the quality of life for persons with Graves' disease and their caregivers and to educate persons with Graves' disease, their caregivers, healthcare professionals, and the general public about Graves' disease and its treatment. The web site features a monitored bulletin board.

LIGHT OF LIFE FOUNDATION

www.checkyourneck.com
email: info@checkyourneck.com

The Light of Life Foundation, founded in 1997, is a nonprofit organization that strives to improve the quality of life for thyroid cancer patients, educate the public and professionals about thyroid cancer, and promote research and development to improve thyroid cancer care.

THYCA: THYROID CANCER SURVIVORS' ASSOCIATION, INC.

www.thyca.org
Phone (toll-free): 877 588-7904
e-mail: thyca@thyca.org

ThyCa: Thyroid Cancer Survivors' Association, Inc., founded in 1995, is an international nonprofit organization, guided by a medical advisory council of renowned thyroid cancer specialists, offering support and information to thyroid cancer survivors, families, and health care professionals worldwide.

AMERICAN THYROID ASSOCIATION®
FOUNDED 1923
www.thyroid.org

ATA Alliance for Thyroid Patient Education
CALENDAR OF EVENTS

Educational forums, patient support groups and other patient-oriented meetings

ATA Conferences www.thyroid.org

Graves' Disease Conferences www.ngdf.org

Fall 2010 — San Diego, CA
Annual Meeting

Light of Life Foundation www.checkyourneck.com

ThyCa Conferences www.thyca.org

Saturday, July 17, 2010 — Stanford, California
California Thyroid Cancer Survivors' Workshop.
FREE — One-day educational program with physician speakers.
Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc. www.thyca.org

September 2010
Thyroid Cancer Awareness Month
Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc. Plus year-round awareness campaigns.
Visit the Raise Awareness Page to download free flyers, or request free awareness materials.

October 15–17, 2010 — Dallas, Texas.
The 13th International Thyroid Cancer Survivors' Conference
Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.

October 16, 2010 — Dallas, Texas
The 8th Annual Dinner/Auction Fundraiser for Thyroid Cancer Research
Thyroid Cancer Survivors' Conference. Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.