

Clinical THYROIDOLOGY FOR PATIENTS



AMERICAN
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Durante et al. Identification and optimal postsurgical follow-up of patients with very low-risk papillary thyroid microcarcinomas. *J Clin Endocrinol* 2010;95:4882-8. 3

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Valle LA, Kloos RT. The prevalence of occult medullary thyroid carcinoma at autopsy. *J Clin Endocrinol Metab*. October 13, 2010. doi:10.1210/jc.2010-0959. 4

Chambon G et al. The use of preoperative routine measurement of basal serum thyrocalcitonin in candidates for thyroidectomy due to nodular thyroid disorders: results from 2733 consecutive patients. *J Clin Endocrinol Metab*. September 29, 2010. doi:10.1210/jc.2010-0162. 4

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Shear wave elastography is a new ultrasound technique used to measure the stiffness of a thyroid nodule to attempt to determine if it is cancerous. This study was performed to determine if shear wave elastography could correctly identify cancerous thyroid nodules.

Shear wave elastography: A new ultrasound imaging mode for the differential diagnosis of benign and malignant thyroid nodules. *J Clin Endocrinol Metab* 2010; 95:5281-8. 6

THYROID AND PREGNANCY Universal screening for thyroid disorders during pregnancy

Thyroid disorders during pregnancy may be associated with a number of complications in the pregnancy and in the baby.

Pregnant women with known risk factors for thyroid disease are easily screened for thyroid disease with blood tests and can be treated decrease the risk of complications during pregnancy. However, screening all pregnant women for the presence of thyroid disease regardless of risk factors is controversial and is not currently done on a routine basis. The goal of this study was to determine how often thyroid disorders are found in pregnant women who have no risk factors for thyroid disease.

Wang W et al The prevalence of thyroid disorders during pregnancy in China: the benefits of universal screening in the first trimester of pregnancy. *Eur J Endocrinol*. November 8, 2010 [Epub ahead of print]. 7

HYPERTHYROIDISM The natural progression of subclinical hyperthyroidism

Hyperthyroidism occurs when the thyroid gland is overactive, producing too much of the thyroid hormones. Subclinical hyperthyroidism occurs when the TSH is suppressed but the T₄ and T₃ levels are normal. About 1-2% of the population has subclinical hyperthyroidism and this condition may not require any treatment. This study was done to see how often subclinical hyperthyroidism will progress to become overt hyperthyroidism and require treatment.

Vadiveloo T et al. The Thyroid Epidemiology, Audit, and Research Study (TEARS): the natural history of endogenous subclinical hyperthyroidism. *J Clin Endocrinol Metab*. October 6, 2010 [Epub ahead of print]. 9

HYPERTHYROIDISM T₃-predominant Graves' disease

Graves' disease is one of the most common causes of hyperthyroidism. It is caused by thyroid stimulating antibodies that attack the thyroid and turn it on, producing high levels of the thyroid hormones T₄ and T₃. A severe form of this disorder is known as T₃-predominant Graves' disease. The present study was done to determine the basis for the increased T₃ production in T₃-predominant Graves' disease.

Ito M et al. Type 1 and type 2 iodothyronine deiodinases in the thyroid gland of patients with 3,5,3'-triiodothyronine-predominant Graves' disease. *Eur J Endocrinol*. October 11, 2010 [Epub ahead of print]. 10

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CLINICAL THYROIDOLOGY FOR PATIENTS

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EDITOR'S COMMENTS

Welcome to a new format for *Clinical Thyroidology for Patients*. This change came as a result of the new format for *Clinical Thyroidology*, a publication of the American Thyroid Association for physicians. This will allow for more articles to be reviewed with more succinct summaries and, most importantly, more details on what the studies mean for patients. *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*. 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*. In this issue, we are highlighting the **Graves' Disease Foundation** as they report on their annual meeting held this past October.

In this issue, the studies ask the following questions:

- How aggressive should therapy be in patients with small thyroid cancers?
- How effective are new ultrasound tests in diagnosing thyroid cancer?
- Should all pregnant women be tested for thyroid disorders?
- What is the natural progression of subclinical hyperthyroidism?
- What is the cause of a severe form of Graves' disease?

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**.

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THYROID CANCER

Management of patients with papillary thyroid microcarcinoma

BACKGROUND

Thyroid cancer is the fastest rising cancer diagnosed in women. Many of these patients have small papillary thyroid cancer < 1 cm in size, so called papillary thyroid microcarcinoma. Since very few of these patients will die from their cancer, there is a debate on how aggressively these patients should be treated. The aim of this study was to identify the best management for these patients with very low risk thyroid cancer.

THE FULL ARTICLE TITLE:

Durante et al. Identification and optimal postsurgical follow-up of patients with very low-risk papillary thyroid microcarcinomas. *J Clin Endocrinol* 2010;95:4882-8

SUMMARY OF THE STUDY

A total of 312 patients from 9 centers in Italy with low risk papillary microcarcinoma without a family history of thyroid cancer, no previous radiation to the neck and head and no spreading of tumor outside the thyroid gland were included in this study and followed for 5-23 years. In all these patients, the thyroid gland was removed and patients were treated with suppressive doses of levothyroxine. After the thyroid surgery, additional radioactive iodine therapy was performed in 44% of the patients and 56% received no radioactive

iodine ablation. There was no evidence of recurrent cancer in any patient during the study and a negative ultrasound exam 1 year after the initial surgery was found in all of these patients. Persistent cancer was seen in only 3% of patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study confirmed that papillary microcarcinoma is a very low risk thyroid cancer. None of the patients developed recurrent thyroid cancer whether or not they were treated with radioactive iodine ablation. This study suggests that patients with papillary microcarcinoma do not need radioactive iodine therapy. Ultrasound of the neck is the most important study for the follow-up in these patients.

— Jamshid Farahati, 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

Thyroid Hormone Treatment: http://thyroid.org/patients/patient_brochures/hormonetreatment.html

ABBREVIATIONS & DEFINITIONS

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

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

Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

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).

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



THYROID CANCER

Medullary Thyroid Carcinoma: prevalence and the case for screening

BACKGROUND

Medullary cancer is a rare form of thyroid cancer that accounts for <10% of all thyroid cancers. Many of these cancers are associated with a genetic mutation and run in families, especially those that occur in younger patients. The prognosis of medullary thyroid carcinoma depends greatly on the completeness of the first surgical treatment. Calcitonin is a hormone that is secreted by medullary cancer cells and serves as a cancer marker. The utility of routine calcitonin level screening for patients with thyroid nodules, has been the subject of debate for years. Some studies support the notion that screening may detect medullary thyroid cancer at an earlier stage and therefore may improve overall survival. However, as with other thyroid cancers, the clinical consequence of small medullary thyroid cancers (<1 cm, micromedullary cancer) that may be identified by screening is unclear. Further, a pre-cancerous condition known as C-cell hyperplasia also secretes calcitonin. In the first study, the authors look at autopsy studies to try to identify how frequently micromedullary cancer is found. In the second study, the authors attempted to link preoperative calcitonin levels with the findings at surgery.

Article 1:

THE FULL ARTICLE TITLE:

Valle LA, Kloos RT. The prevalence of occult medullary thyroid carcinoma at autopsy. *J Clin Endocrinol Metab.* October 13, 2010. doi:10.1210/jc.2010-0959.

SUMMARY OF THE STUDY

The authors screened the autopsy reports on a total of 7900 subjects for the finding of micromedullary thyroid carcinoma. These subjects were without known thyroid disease at time of death. Based on this study, micromedullary thyroid carcinoma was found in 0.14% to 0.42 % of subjects at the time of autopsy. In comparison, the more common micropapillary cancer was found in 7.6% to 8.4% of subjects at autopsy.

Article 2:

THE FULL ARTICLE TITLE:

Chambon G et al. The use of preoperative routine measurement of basal serum thyrocalcitonin in candidates for thyroidectomy due to nodular thyroid disorders: results from 2733 consecutive patients. *J Clin Endocrinol Metab.* September 29, 2010. doi:10.1210/jc.2010-0162.

SUMMARY OF THE STUDY

A total of 2733 French patients with thyroid nodules who were scheduled for thyroid surgery had calcitonin levels measured before surgery. Only 43 patients had elevated calcitonin levels and all had a total thyroidectomy. A total of 7 patients had elevated calcitonin levels had a pre-operative diagnosis of medullary thyroid cancer by biopsy of a known thyroid nodule. A total of 5 patients had micromedullary thyroid cancer and 31 had C-cell hyperplasia. Patients with micromedullary thyroid cancer had no evidence of the cancer prior to surgery other than elevated calcitonin levels. One of these patients was found to have spread of the cancer to the lymph nodes at the time of surgery. Of the 2690 patients whose calcitonin level was not elevated before surgery, 2 had micromedullary thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THESE STUDIES?

Medullary thyroid cancer is often diagnosed early in life, with most genetically-linked cases diagnosed in early adulthood and sporadic cases in fourth decade of life. It is clear that calcitonin screening should be performed in patients with a family history of medullary cancer. Further, surgery is indicated in patients with elevated calcitonin levels even if these turn out to be micromedullary cancers or C-cell hyperplasia. It is unclear what to do with micromedullary cancers that do not have a genetic mutation. The first study indicates that micromedullary cancer is found in <1% of individuals

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THYROID CANCER, continued

without known thyroid disease. Screening all patients with thyroid nodules would identify mostly C-cell hyperplasia. While C-cell hyperplasia is a precancerous condition, little is known about how frequently C-cell hyperplasia progresses to medullary thyroid cancer. Thus, calcitonin screening before surgery subjected 31 patients who had C-cell hyperplasia to surgery that may well be unnecessary. However, 5 patients were identified with micromedullary cancer and 20% of these patients had spread of the cancer to the lymph nodes, indicating that even micromedullary

cancer can be aggressive. Thus, more studies are needed to define the behavior of C-cell hyperplasia and micromedullary cancer before recommending general calcitonin screening.

— Mona Sabra, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

Medullary thyroid cancer — a relatively rare type of thyroid cancer that also may be inherited through a genetic mutation. Medullary cancer arises from the C-cells in the thyroid.

Micro-medullary thyroid cancer — a medullary thyroid cancer <1 cm in size.

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.

C-cell hyperplasia — An abnormal growth of parafollicular (C-cells) cells that usually occurs before the development of familial forms of medullary thyroid cancer and is considered a pre-cancerous condition

Calcitonin — a hormone that is secreted by cells in the thyroid (C-cells) that has a minor effect on blood calcium levels. Calcitonin levels are increased in patients with medullary thyroid cancer.



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THYROID NODULES

Shear wave elastography for thyroid nodules

BACKGROUND

Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Despite many studies, there are no specific findings that will clearly determine if a nodule is cancerous without performing a biopsy and/or surgery. Shear wave elastography is a new ultrasound technique used to measure the stiffness of a thyroid nodule to attempt to determine if it is cancerous. This is based on the assumption that cancerous nodules are stiffer than benign ones. This study was performed to determine if shear wave elastography could correctly identify cancerous thyroid nodules.

THE FULL ARTICLE TITLE:

Shear wave elastography: A new ultrasound imaging mode for the differential diagnosis of benign and malignant thyroid nodules. *J Clin Endocrinol Metab* 2010; 95:5281-8

SUMMARY OF THE STUDY

A total of 93 patients with thyroid nodules were evaluated with both shear wave elastography and usual ultrasound imaging. A total of 61 patients had a single nodule and 32 patients had many nodules. All patients with multiple nodules and 47 of the 61 patients with single nodules underwent surgery. The average elasticity index was significantly higher in cancerous nodules than in non-cancerous nodules and normal thyroid

glands. All follicular cancers had an increased elasticity index. Fifteen of the solitary nodules were cancerous and 8 patients with multiple nodules had a total of 14 separate cancers. In this small group of patients, shear elastography seemed to be more accurate than conventional ultrasound and was able to correctly exclude malignancy in a larger proportion of patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Shear wave elastography appears to be a more accurate method than conventional ultrasound to evaluate thyroid nodules. It seems to be particularly helpful in the diagnosis of follicular thyroid cancers because these cancers often do not have the typical ultrasound characteristics of thyroid cancer and they usually cannot be diagnosed by biopsy. However, further studies including larger number of patients are needed to confirm these findings and to determine the true value of this new technique in the evaluation of patients with thyroid nodules.

— M. Regina Castro, 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

Shear wave elastography — an ultrasound technique used to measure the stiffness of a thyroid nodule. Cancerous nodules are stiffer than benign nodules.

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.

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



THYROID AND PREGNANCY

Universal screening for thyroid disorders during pregnancy

BACKGROUND

Thyroid disorders during pregnancy may be associated with a number of complications including miscarriage, preterm delivery, impaired brain development in the children and postpartum thyroid inflammation in the mother. Several studies have shown that abnormal thyroid hormone levels may be seen in ~5% of pregnant women and positive thyroid peroxidase antibodies (TPO AB, a marker of autoimmune thyroid disease) with normal thyroid levels may be seen in up to 20% of pregnant women. There are known risk factors for developing thyroid disorders during pregnancy, including: a family history of autoimmune thyroid disorders, presence of a goiter, signs and symptoms of thyroid disease, known thyroid dysfunction, history of type 1 diabetes mellitus or other autoimmune diseases, prior neck irradiation and previous miscarriages or preterm deliveries. Pregnant women with these known risk factors are easily screened for thyroid disease with blood tests of TSH and TPO AB. Women with abnormal levels of TSH or TPO AB can be treated with thyroid hormone to decrease the risk of complications during pregnancy. However, screening all pregnant women for the presence of thyroid disease regardless of risk factors is controversial and is not currently done on a routine basis. The goal of this study was to determine how often abnormal TSH and/or TPO AB levels are found in pregnant women who have no risk factors for thyroid disease.

THE FULL ARTICLE TITLE:

Wang W et al The prevalence of thyroid disorders during pregnancy in China: the benefits of universal screening in the first trimester of pregnancy. *Eur J Endocrinol*. November 8, 2010 [Epub ahead of print].

SUMMARY OF THE STUDY

The study group included 2899 pregnant women in their first trimester living in Shenyang, China. Thyroid hormones were measured in all women and a questionnaire was obtained asking about thyroid risk factors. The average age of the women was 27.6 years and 367 of the 2899 women (12.7%) were identified as having one or more thyroid risk factors. The most common

risk factor was a personal or family history of thyroid disease or a previous miscarriage. A total of 294 women (10.2%) had abnormal thyroid hormone levels, with most having an increased TSH and/or a low FT₄. TPO AB with normal thyroid hormone levels were present in 279 (9.6%) women. Abnormal thyroid levels were more common in the women with one or more thyroid risk factors as compared to no risk factors. However, most of the women with an increased TSH (171, 78.8%) had no risk factors. Of the 28 patients with hyperthyroidism, only 7 were in the high-risk group. This study suggests that only screening women with thyroid risk factors would miss >80% of women with thyroid disorders.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

It is clear that untreated thyroid disorders during pregnancy may lead to complications including miscarriage, preterm delivery and impaired brain development in the children. The current standard of care includes screening all women with risk factors for thyroid disorders, usually with a TSH and TPO AB level. However this study is one of several recent studies that conclude that most women that have undiagnosed thyroid disorders during pregnancy do not have any risk factors (see [Leung, A “Thyroid disorders are common in pregnant women without risk factors for thyroid disease” *Clinical Thyroidology for Patients*, November 2010](#) and [Braunstein, G “Effects of detection and treatment of hypo- and hyperthyroidism in pregnancy” *Clinical Thyroidology for Patients*, May 2010](#)). Thus, the only way they would be diagnosed would be through screening all women. In this study, only 198 of the 2532 women (7.8%) with no risk factors had thyroid disorders, so >90% of women screened would have normal thyroid function. In summary, this study shows that screening only women with risk factors would miss a significant number of women with thyroid disorders and provides further evidence to support screening all pregnant women for thyroid disorders.

— Alan P. Farwell, MD

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THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

Thyroid Disease and Pregnancy: http://www.thyroid.org/patients/patient_brochures/pregnancy.html

Thyroiditis: http://www.thyroid.org/patients/patient_brochures/thyroiditis.html

Hypothyroidism: http://www.thyroid.org/patients/patient_brochures/hypothyroidism.html

ABBREVIATIONS & DEFINITIONS

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

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.

Goiter — a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning

normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

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

Levothyroxine — the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levothroid™ and generic preparations.

Miscarriage — this occurs when a baby dies in the first few months of a pregnancy, usually before 22 weeks of pregnancy.



HYPERTHYROIDISM

The natural progression of subclinical hyperthyroidism

BACKGROUND

Hyperthyroidism occurs when the thyroid gland is overactive, producing too much of the thyroid hormones. Overt hyperthyroidism occurs when levels of the thyroid hormones (T_4 and T_3) are elevated and the TSH is suppressed. This is usually caused by Graves' disease or toxic nodules. Patients with overt hyperthyroidism usually receive some form of treatment which may include medications, radioactive iodine or thyroid surgery. Subclinical hyperthyroidism occurs when the TSH is suppressed but the T_4 and T_3 levels are normal. About 1-2% of the population has subclinical hyperthyroidism and this condition may not require any treatment. Previous studies suggest that only very few of these patients will progress to develop an overt hyperthyroidism. This study was done to see how often subclinical hyperthyroidism will progress to become overt hyperthyroidism.

THE FULL ARTICLE TITLE:

Vadiveloo T et al. The Thyroid Epidemiology, Audit, and Research Study (TEARS): the natural history of endogenous subclinical hyperthyroidism. *J Clin Endocrinol Metab.* October 6, 2010 [Epub ahead of print].

SUMMARY OF THE STUDY

The study included nearly 300,000 patients in Scotland who had thyroid blood tests done between 1993-

2009. Of these, about 2,000 patients had subclinical hyperthyroidism. These patients were followed for 7 years. The major finding was that only 10% of patients with an undetectable TSH developed overt hyperthyroidism. None of the patients with a slightly low but detectable TSH developed overt hyperthyroidism and ~1/3 of patients had their TSH return to the normal range. Thus, very few patients with subclinical hyperthyroidism develop overt hyperthyroidism. In the majority, the TSH returns to normal or remain stable.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The conclusions of this study reassure us that very few patients with subclinical hyperthyroidism go on to develop overt hyperthyroidism. Those at highest risk are those with an undetectable TSH. Despite this, over 40% may end up on treatment at some point; thus these patients need to be followed closely. This study provides support that watching without treatment is a reasonable approach for most patients with subclinical hyperthyroidism.

— Angela Leung, MD

ATA THYROID BROCHURE LINKS

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

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.

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

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.

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 (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.



HYPERTHYROIDISM

T₃-predominant Graves' disease

BACKGROUND

Graves' disease is one of the most common causes of hyperthyroidism. It is caused by thyroid stimulating antibodies that attack the thyroid and turn it on, producing high levels of the thyroid hormones T₄ and T₃. Most patients with Graves' disease respond well to medical treatment, but a small number of patients have persistent increased levels of T₃ despite taking antithyroid medication (T₃-predominant Graves' disease). This group of patients tends to have a more severe form of the disease with higher thyroid hormone levels and more thyroid gland enlargement, as well as relative resistance to treatment with antithyroid medications. The present study was done to determine the basis for the increased T₃ production in T₃-predominant Graves' disease.

THE FULL ARTICLE TITLE:

Ito M et al. Type 1 and type 2 iodothyronine deiodinases in the thyroid gland of patients with 3,5,3'-triiodothyronine-predominant Graves' disease. *Eur J Endocrinol*. October 11, 2010 [Epub ahead of print].

SUMMARY OF THE STUDY

Data from 31 patients who underwent thyroidectomy for treatment of Graves' disease were evaluated, 13 patients with T₃-predominant Graves' disease and 18 patients with "common-type" Graves' disease. In addition, deiodinase enzyme activity was determined from thyroid tissue obtained at surgery. The deiodinase enzymes convert T₄ to T₃ by removing an iodine molecule from T₄. It was found that patients with T₃-predominant Graves' disease

were significantly younger and had much larger thyroid glands. Thyroid stimulating antibodies were 40-fold greater and thyroid-stimulating antibody 3-fold greater in patients with T₃-predominant Graves' disease compared to those with "common-type" Graves' disease. Levels of the deiodinase enzymes were significantly higher in patients with T₃-predominant Graves' disease compared to patients with the usual Graves' disease and correlated with the high levels of the thyroid stimulating antibodies.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

T₃-predominant Graves' disease was first described in 1984 and has been a form of Graves' disease that has been particularly difficult to treat with antithyroid medications alone. The current study has given us a better understanding of the mechanisms underlying T₃-predominant Graves' disease. In so doing, this study may make it easier to diagnose this severe form of Graves' disease and may point the way toward newer therapies for Graves' disease in general.

— Frank Cranz, MD

ATA THYROID BROCHURE LINKS

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

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

Thyroid Function Tests: http://thyroid.org/patients/patient_brochures/function_tests.html

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.

Thyroxine (T₄): 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 (T₃): the active thyroid hormone, usually produced from thyroxine.

Deiodinase enzymes: these enzymes convert T₄ to T₃ on the cellular level by removing an iodine molecule from T₄.



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.





HIGHLIGHT: Graves' Disease Foundation

The Graves' Disease Foundation holds successful annual Patient & Family Conference

The Graves' Disease Foundation's annual Patient & Family Conference was held Oct. 22-24 at San Diego's Bahia Resort Hotel. Attendees had an opportunity to learn more about Graves' Disease and connect with fellow patients, family members and medical professionals through a series of presentations, roundtable discussions, and small group sessions.

Chief Medical and Scientific Officer Dr. Terry Smith lined up a stellar group of presenters, who traveled from all over the country to share their expertise on Graves' Disease. Many attendees commented that they learned more in three days than they had in years of living with Graves' Disease. Highlights included an overview of Graves' Disease from Dr. Smith, advice from patient and GDF Founder and Chairman Emeritus Nancy Patterson, PhD, on "Taking Control of my Graves' Disease," two different "Ask the Doctor" Q&A sessions, and a series of presentations titled "What Can I Expect?" The "What Can I Expect?" series, new to the 2010 conference, helped to "de-mystify" common procedures by giving patients in-depth information on Thyroid Surgery, Radioactive Iodine Treatment, Decompression Surgery and Strabismus Surgery.

Additional speakers included Anca Avram, MD, Lawrence Wood, MD, Barbara Miller, MD, Andrew Gianoukakis, MD, Ray Douglas, MD, Kim Cockerham, MD, Don Kikkawa, MD and Mark Lucarelli, MD. Presenters not only shared their knowledge about Graves' Disease, but also made themselves available throughout the weekend to answer one-on-one questions from patients and family members.

During Saturday night's closing banquet, several volunteers and supporters received special recognition for their outstanding service.

Lifetime Achievement

Lawrence C. Wood, MD

Dr. Wood, Associate Physician at Massachusetts General Hospital (ret.) and founder of the Thyroid Foundation of America, was recognized for his commitment to education and research, as well as his life-long service to patients with Graves' and other thyroid disorders.

Fundraising Achievement

Nicole McDonald, MD and Steven McDonald

The McDonalds were honored for hosting the "Rockin' for a Cure" event at the Quequechan Club in Fall River, MA. This event sold out in its inaugural year and raised over \$12,000 for education and research.

Corporate Leadership

Diagnostic Hybrids

Ohio-based Diagnostic Hybrids developed the TSI test, which is being increasingly used to provide Graves' patients with a timely diagnosis. As a two-time sponsor of the Foundation's annual conference, Diagnostic Hybrids has demonstrated its commitment to patient education and empowerment.

Patient Services

Becky Nicholson and Andy Nicholson

The Nicholsons lead a monthly support group in Belleville, IL. Through an innovative partnership with Memorial Hospital, the Nicholsons have expanded their outreach to patients all over the world by recording selected featured speakers and making the presentations available for viewing over the Internet.

Special Recognition

Sharon Barbour and Kaye Lee Day.

Sharon is a long-time supporter of the Graves' Disease Foundation. Perhaps better known by her screen name, "SKI", Sharon is a constant presence on the Graves' Disease Foundation's public bulletin boards, providing patients with information, encouragement, reassurance and hope. As a support group leader in Salt Lake City, UT, Kaye Lee has been instrumental in raising awareness in the Salt Lake community. Kaye Lee's expertise in graphic design has been invaluable in helping the Foundation enhance its name recognition.

The next Graves' Disease Foundation Patient & Family Conference is scheduled for Fall 2011 in Boston, MA. Dates and hotel information will be announced shortly.



ATA Alliance for Thyroid Patient Education CALENDAR OF EVENTS

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

ATA Conferences www.thyroid.org

Saturday, October 29, 2011

1:00 pm – 3:00 pm — Indian Wells, CA

FREE Public Health Forum — Thyroid Disease and You

Graves' Disease Conferences www.ngdf.org

Fall, 2011 — Boston, MA

Annual Patient & Family Conference

Light of Life Foundation www.checkyourneck.com

Ongoing

Thyroid Cancer Awareness campaign with Cindy Crawford and Brooke Shields

June 12, 2010 — available online at:

<http://www.checkyourneck.com/About-Thyroid-Cancer/Thyroid-Cancer-Symposium-Presentations>

Thyroid Cancer Symposium Presentations: What's New in Thyroid Cancer?

A Day for Patients and Their Families

Please visit the Light of Life Foundation website to view the Patient Educational Symposium which took place in NYC in 2010. As part of the Patient Educational Program these online presentations provide valuable information in hopes that patients everywhere can gain further information and support about their disease.

ThyCa Conferences www.thyca.org

October 14–16, 2011 — Los Angeles, California

14th International Thyroid Cancer Survivors' Conference

(at the Hilton Los Angeles Airport Hotel, 5711 West Century Boulevard, Los Angeles, California)

September, 2011 — Worldwide

Thyroid Cancer Awareness Month

FREE Public Health Forum

Thyroid Experts from the American Thyroid Association and thyroid patients join together to inform the general public, other thyroid patients, and their friends and families about:



Thyroid Disease and You

Have you experienced a significant change in:

Energy?

Memory?

Fatigue level after a good night's sleep?

Depression?

Rapid heart beat?

Restlessness?

Infertility?

Weight?

Hair?

A lump on your neck?

Could it be your thyroid?

Public Forum will be held on Saturday, October 29, 2011

1:00 pm – 3:00 pm

Indian Wells, California

Renaissance Esmeralda Resort and Spa, 44-400 Indian Wells Lane, Indian Wells CA 92210-8708
Phone: 760-773-4444 or toll free at 800-446-9875

Physician experts will discuss thyroid disorders. This program is free and all are welcome, including walk-in-attendees. Reservations are encouraged to ensure we have enough seating. For more information and to register, please e-mail ThyCa at thyca@thyca.org.

Who should attend? Anyone who has had an overactive or underactive thyroid, thyroiditis, a thyroid nodule, thyroid cancer, or a family history of thyroid problems or related disorders, including rheumatoid arthritis, juvenile diabetes, pernicious anemia, or prematurely gray hair (starting before age 30) Please come if you have questions, symptoms, or concerns about a thyroid problem. Receive free educational materials.

Reservations requested. Walk-ins welcome. E-mail thyca@thyca.org to RSVP
(Please indicate in your message the thyroid condition you are most concerned about.)

Online educational information for patients is provided by all members of the ATA Alliance for Patient Education co-sponsoring this forum: ThyCA: Thyroid Cancer Survivors' Association, Light of Life Foundation, and Graves' Disease Foundation. Go online to www.thyroid.org and click on "Patients and Public" to access the resources you need.