

CLINICAL THYROIDOLOGY FOR PATIENTS



AMERICAN
THYROID
ASSOCIATION
FOUNDED 1923

VOLUME 3 • ISSUE 8 • AUGUST 2010

www.thyroid.org

EDITOR'S COMMENTS 2

THYROID HORMONE AND PREGNANCY

Hypothyroxinemia and risk for delays in brain development

Thyroid hormone is essential for the brain of a baby to develop normally during pregnancy. It is clear that brain development of the fetus may be harmed if the mother is hypothyroid during the first half of pregnancy. The goal of this study was to examine the association between low thyroid hormone levels (hypothyroxinemia) in pregnant women and a variety of studies of brain development in their children.

Henrichs J et al. Maternal thyroid function during early pregnancy and cognitive functioning in early childhood: the Generation R Study. *J Clin Endocrinol Metab* 2010; jc.2010-0415 [pii];10.1210/jc.2010-0415 [doi] 3

THYROID AND PREGNANCY

First Trimester TSH levels between 2.5 and 5.0 are associated with increased pregnancy loss.

For at least the first half of pregnancy, the fetus gets thyroid hormone from the mother, so it is important that the mother has normal thyroid function during this time. However, the definition of a normal TSH during pregnancy has been changing over time. This study investigated the rate of preterm (early) delivery and pregnancy loss in women without hypothyroidism but with a TSH in the upper range of normal (TSH 2.5-5 mIU/L).

Negro R et al. Increased Pregnancy Loss Rate in Thyroid Antibody Negative Women with TSH Levels between 2.5 and 5.0 in the First Trimester of Pregnancy. *J. Clin. Endocrinol. Metab.* 95 (9): 2010. 5

THYROID CANCER

Thyroid Cancer seems to be similar in children and young adults

Thyroid cancer is relatively rare in children, but there are still a substantial number of children who are diagnosed with papillary thyroid cancer. Some studies have suggested that children often have more extensive disease as compared to adults. Despite this, most children have a good prognosis and usually have a long life expectancy that is minimally affected by the thyroid cancer. This study examined thyroid cancer in children and young adults in order to determine any differences in these two age groups in the growth pattern and metastatic behavior of papillary thyroid cancer.

Machens et al. Papillary Thyroid cancer in children and adolescents does not differ in growth pattern and metastatic behavior. *J Pediatr* 2010. S0022-3476(10)00326-4 [pii];10.1016/j.

jpeds.2010.04.026 [doi]. 7

GRAVES' OPTHALMOPATHY

Rituximab appears to be effective in the treatment of severe thyroid eye disease

Thyroid eye disease (TED), also known as Graves ophthalmopathy, is an inflammatory disorder most often associated with Graves' disease but also can be seen with Hashimotos thyroiditis. Mild TED can be treated relatively easily, but treatment of severe disease is difficult. Many immunosuppressive drugs have been tried in patients with severe TED with minimal or no effect or with too many side effects. Rituximab is a selective immunosuppressive drug that specifically targets B lymphocytes, a major cause of inflammation in Graves' disease and in TED. The goal of this study was to evaluate the safety and effectiveness of rituximab in the treatment of TED.

Silkiss RZ, et al. Rituximab for Thyroid Eye Disease. *Ophthal Plast Reconstr Surg* 2010. DOI: 10.1097/IOP.0b013e3181c4dfde. 9

THYROID CANCER

The decrease in serum calcitonin concentrations after surgery in patients with medullary thyroid cancer identifies patients with persistent cancer

Medullary cancer is a rare form of thyroid cancer, accounting for <10% of all thyroid cancers. 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 aim of this study was to determine if measurement of calcitonin during surgery is an effective predictor of residual cancer in patients with medullary thyroid cancer.

Faggiano A et al. A decrease of calcitonin serum concentrations less than 50 percent 30 minutes after thyroid surgery suggests incomplete C-cell tumor tissue removal. *J Clin Endocrinol Metab* 2010. 0-0045 [pj.201ii];10.1210/jc.2010-0045[doi]. 11

ATA ALLIANCE FOR THYROID PATIENT EDUCATION 13

Calendar of Events. 14



AMERICAN
THYROID
ASSOCIATION

FOUNDED 1923

www.thyroid.org

Editor

Alan P. Farwell, MD
Boston Medical Center
Boston University School of Medicine
88 East Newton St., Boston, MA 02115
Director of Patient Education
American Thyroid Association
e-mail: thyroid@thyroid.org
www.thyroid.org/patients/ct/index.html

Associate Editor

Ernest L. Mazzaferri, MD
University of Florida

Editorial Board

Ruth Belin, MD	Indianapolis, IN
Gary Bloom	New York, NY
Glenn Braunstein, MD	Los Angeles, CA
M. Regina Castro, MD	Rochester, MN
Frank Crantz, MD	McLean, VA
Jamshid Farahati, MD	Bottrop, Germany
Henry Fein, MD,	Baltimore, MD
Heather Hofflich, MD	San Diego, CA
Mona Sabra, MD	New York, NY
Jerrold Stock, MD	Morristown, NJ
Whitney Woodmansee, MD	Boston, MA

American Thyroid Association

President

Gregory A. Brent, MD

Secretary/Chief Operating Officer

Richard T. Kloos, MD

Treasurer

David H. Sarne, MD

President-Elect

James A. Fagin, MD

Secretary-Elect

John C. Morris, MD

Past-President

Terry F. Davies, MD

Executive Director

Barbara R. Smith, CAE
American Thyroid Association
6066 Leesburg Pike, Suite 550
Falls Church, VA 22041
Telephone: 703-998-8890
Fax: 703-998-8893
Email: thyroid@thyroid.org

Designed by

Karen Durland
Email: kdurland@gmail.com

Clinical Thyroidology for Patients

Copyright © 2010
American Thyroid Association, Inc.
All rights reserved.

CLINICAL THYROIDOLOGY **FOR PATIENTS**

A publication of the American Thyroid Association

VOLUME 3 • ISSUE 8 • AUGUST 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*.

In this issue, studies ask the following questions:

- Is there a risk for delayed brain development in children of women without hypothyroidism but lower thyroxine levels during pregnancy?
- Is there a risk for miscarriage in women without hypothyroidism but TSH values in the upper normal range during pregnancy?
- Is there a difference in thyroid cancer between children and young adults?
- How effective is a new treatment in patients with severe thyroid eye disease?
- Can inter-operative calcitonin levels predict a cure in medullary thyroid cancer?

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**.



THYROID HORMONE AND PREGNANCY

Hypothyroxinemia and risk for delays in brain development

WHAT IS THE STUDY ABOUT?

Thyroid hormone is essential for the brain of a baby to develop normally during pregnancy. For at least the first half of pregnancy, the fetus gets thyroid hormone from the mother. It is clear that brain development of the fetus may be harmed if the mother is hypothyroid during this time. What is less clear is if there are any subtle effects on brain development if the thyroid hormone levels are on the low side in the woman who does not have hypothyroidism. The goal of this study was to examine the association between low thyroid hormone levels (hypothyroxinemia) in pregnant women and a variety of studies of brain development in their children.

THE FULL ARTICLE TITLE:

Henrichs J et al. Maternal thyroid function during early pregnancy and cognitive functioning in early childhood: the Generation R Study. *J Clin Endocrinol Metab* 2010; jc.2010-0415 [pii];10.1210/jc.2010-0415 [doi].

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to examine the association between low thyroid hormone levels (hypothyroxinemia) in pregnant women and a variety of studies of brain development in their children.

WHO WAS STUDIED?

The study group included 3,659 pregnant women and their children, the so-called Generation R study, in Rotterdam, the Netherlands.

HOW WAS THE STUDY DONE?

The data was obtained from April 2002-January 2006 in pregnant woman and their children. Thyroid hormone measurements were obtained from women early in pregnancy. Their children had their thyroid hormone measured beginning at birth. The children's verbal (language) and nonverbal brain development was examined at 18 and 30 months by a test known as the MacArthur Communicative Development Inventory.

Maternal mild and severe hypothyroxinemia were defined as normal TSH levels and FT₄ concentrations in early pregnancy below the 10th percentile (FT₄, <0.91 ng/dl) and the 5th percentile (FT₄, <0.85 ng/dl), respectively.

WHAT WERE THE RESULTS OF THE STUDY?

The results showed that 1.5% of the mothers had hypothyroidism, 8.5% had mild hypothyroxinemia and 4.3% had severe hypothyroxinemia. There was a dose-response relationship in the lower range of the thyroid hormone distribution with verbal and nonverbal delays in early childhood. This means that the lower the T₄ level, the worse the delay.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other studies have shown similar results, although most of the studies examined hypothyroid pregnant women while this study included all women in the group.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that low T₄ levels in the mother can have adverse affects on the brain development of the fetus even if the mother does not have hypothyroidism. The study suggests that pregnant women with low T₄ levels should be treated with thyroid hormone early even if they are not hypothyroid.

— Heather Hofflich, MD

ATA THYROID BROCHURE LINKS

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

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

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

continued on next page



THYROID HORMONE AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

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.

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

Thyroid hormone therapy — patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal.

MacArthur Communicative Development Inventory — a psychological test that examines both verbal (language) and non-verbal brain development.



THYROID AND PREGNANCY

First Trimester TSH levels between 2.5 and 5.0 are associated with increased pregnancy loss

WHAT IS THE STUDY ABOUT?

Thyroid hormone is essential for a baby to develop normally during pregnancy. For at least the first half of pregnancy, the fetus gets thyroid hormone from the mother, so it is important that the mother has normal thyroid function during this time. In the non-pregnant woman, normal thyroid function is attributed to a TSH level in the normal range, usually 0.5 – 5 mIU/L. However, the definition of a normal TSH during pregnancy has been changing over time. In 2007, The Endocrine Society recommended that all women on thyroid hormone replacement therapy (levothyroxine) have TSH less than 2.5 mIU/L during the first trimester and less than 3 mIU/L throughout pregnancy. This study investigated the rate of preterm (early) delivery and pregnancy loss in women without hypothyroidism but with a TSH in the upper range of normal (TSH 2.5-5 mIU/L).

THE FULL ARTICLE TITLE:

Negro R et al, Increased Pregnancy Loss Rate in Thyroid Antibody Negative Women with TSH Levels between 2.5 and 5.0 in the First Trimester of Pregnancy. *J. Clin. Endocrinol. Metab.* 95 (9): 2010.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to evaluate the rate of preterm delivery and pregnancy loss in women without hypothyroidism who had a TSH between 2.5-5.0 mIU/L compared to women with TSH less than 2.5 mIU/L.

WHO WAS STUDIED?

The women in this study are a subgroup of a larger prospective study of thyroid function and pregnancy. This study included 4123 women who were all negative for anti-thyroid antibodies (ie no evidence of intrinsic thyroid disease) and had a TSH less than or equal to 5.0 mIU/L. Hyperthyroid women were excluded. The women were divided into two groups for evaluation: Group A had TSH levels less than 2.5mIU/L and Group B had TSH levels 2.5-5.0 mIU/L.

HOW WAS THE STUDY DONE?

All pregnant women in the study had a FT₄ and TSH drawn during the first trimester. They were then followed normally throughout pregnancy. Pregnancy outcomes were recorded and the rates of pregnancy loss and preterm delivery were compared between women in the two groups.

WHAT WERE THE RESULTS OF THE STUDY?

A total of 3481 (84.4%) pregnant women had a TSH less than 2.5mIU/L during the first trimester and were in Group A. The remaining 642 women (15.6%) were in Group B and had a first trimester TSH between 2.5-5.0m IU/L. The average TSH of the women in Group A was 0.82 compared to an average TSH of 3.14 in the women in Group B. The spontaneous pregnancy loss rate was significantly lower in the women in Group A compared to Group B. Only 3.6% of women with a TSH less than 2.5 during the first trimester (Group A) had a spontaneous pregnancy loss versus 6.1% of the Group B women with a TSH 2.5-5.0 mIU/L. There were no significant differences in rates of preterm delivery.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several studies have suggested that hypothyroidism is associated with pregnancy loss but the results in women with subclinical or mild hypothyroidism have been somewhat conflicting. Studies of women during pregnancy have suggested the TSH normal range is not the same as for non-pregnant individuals but the exact range had not been clearly identified. This study is the first to examine pregnancy loss and preterm delivery in women with TSH in the 2.5-5.0mIU/L range, which is generally considered to be the upper half of the normal range in non-pregnant individuals.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The clinical implication of this study is that a TSH greater than 2.5 mIU/L may not be normal during the first trimester of pregnancy. This study suggests that the upper limit of the TSH normal range should be redefined as less than 2.5 mIU/L during pregnancy.

— Whitney Woodmansee, MD

continued on next page



THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

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

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

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

ABBREVIATIONS & DEFINITIONS

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. Levothyroxine is the available medication to replace thyroid hormone.

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.

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

Pregnancy Loss — generally, this term refers to stillbirth and/or miscarriage.

Preterm Delivery — usually defined as a pregnant woman going into labor and delivering a child before full 40 weeks of pregnancy has been completed. "Preterm delivery" often refers to delivery of a child between 34-37 weeks pregnancy and "very preterm delivery" refers to delivery of a child at less than 34 weeks pregnancy.



AMERICAN
THYROID
ASSOCIATION
FOUNDED 1923



Friends of the ATA

Founded 2005

Become a Friend of the ATA! [Subscribe to Friends of the ATA e-news >>](#)

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.



THYROID CANCER

Thyroid Cancer seems to be similar in children and young adults

WHAT IS THE STUDY ABOUT?

Thyroid cancer is relatively rare in children, but there are still a substantial number of children who are diagnosed with papillary thyroid cancer. A cancer registry of cases nationwide, the Surveillance, Epidemiology and End Results (SEER), recently reported that almost 8% of all cancers in teenagers were thyroid cancer. Some studies have suggested that children often have more extensive disease as compared to adults. Despite this, most children have a good prognosis and usually have a long life expectancy that is minimally affected by the thyroid cancer. This study examined thyroid cancer in children and young adults in order to determine any differences in these two age groups in the growth pattern and metastatic behavior of papillary thyroid cancer.

THE FULL ARTICLE TITLE:

Machens et al, Papillary Thyroid cancer in children and adolescents does not differ in growth pattern and metastatic behavior. *J Pediatr* 2010. S0022-3476(10)00326-4 [pii];10.1016/j.jpeds.2010.04.026 [doi].

WHAT WAS THE AIM OF THE STUDY?

The goal of the study was to examine thyroid cancer in children and young adults in order to determine any differences in these two age groups.

WHO WAS STUDIED?

The study group included 83 patients under the age of 18 who were operated and treated at the Martin Luther Hospital in Halle, Germany. The group was divided into ages 6-11, 12-15 and 16-18 years old.

HOW WAS THE STUDY DONE?

The patients medical records were reviewed and their clinical status was recorded and summarized in this report. Patients all underwent total thyroidectomy and 96% also had removal of lymph nodes. Patients were treated with radioactive iodine as required.

WHAT WERE THE RESULTS OF THE STUDY?

There was no difference in the spread of the thyroid cancer to the lymph nodes in any age group; indeed most patients in all age groups had spread of the thyroid cancer to the lymph nodes. The larger cancers had increased extrathyroidal growth, but there was no difference between the age groups in the growth pattern of the thyroid cancer.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several other studies have shown that children have more advanced thyroid cancer at their initial diagnosis than adults. The study confirms that most of the patients had spread of the cancer to the lymph nodes. Despite the more extensive disease, children have the lowest mortality rate for thyroid cancer according to the SEER database.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that children frequently have extensive thyroid cancer but there does not appear to be any difference in the extent of the cancer between younger children and adolescents. Despite the more extensive disease, few children diagnosed with thyroid cancer will eventually die of the disease.

— Henry Fein, 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.htm

continued on next page



THYROID CANCER, continued

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.

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).

SEER — Surveillance, Epidemiology and End Results program, a nation-wide anonymous cancer registry generated by the National Cancer Institute that contains information on 26% of the United States population. Website: <http://seer.cancer.gov/>



GRAVES' OPHTHALMOPATHY

Rituximab appears to be effective in the treatment of severe thyroid eye disease

WHAT IS THE STUDY ABOUT?

Thyroid eye disease (TED), also known as Graves ophthalmopathy, is an inflammatory disorder most often associated with Graves' disease but also can be seen with Hashimoto's thyroiditis. Mild TED can be treated relatively easily but treatment of severe disease is difficult. Fortunately, severe TED with marked inflammation of the eye and eye muscles, bulging of the eyes and double vision is rare. Although steroid therapy can help to control the inflammation around the eyes and long-term treatment is effective, there can be significant side effects from this treatment. External radiation can improve the mobility of the eye muscles, but does not help with the double vision and bulging of the eyes in these patients. Many immunosuppressive drugs have been tried in patients with severe TED with minimal or no effect. Rituximab is a selective immunosuppressive drug that specifically targets B lymphocytes, a major cause of inflammation in Graves' disease and in TED. This drug has been used in other autoimmune diseases. The goal of this study was to evaluate the safety and effectiveness of rituximab in the treatment of TED.

THE FULL ARTICLE TITLE:

Silkiss RZ, et al. Rituximab for Thyroid Eye Disease. *Ophthal Plast Reconstr Surg* 2010. DOI: 10.1097/IOP.0b013e3181c4dfde.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to evaluate the safety and efficacy of rituximab in the treatment of TED.

WHO WAS STUDIED?

The study group included 12 patients from 2 centers in the United States. All patients were 18 years of age or older and had active TED that had not improved with a short course of steroids.

HOW WAS THE STUDY DONE?

Demographic data on all patients was collected, including age, sex, smoking status at time of presentation, whether 1 or 2 eyes were affected and serum autoantibody levels, including thyroid stimulating immunoglobulin, TSH receptor and TPO antibodies. All patients who had

TED which had not improved with a short course of glucocorticoids and who had negative tests for infections with hepatitis B, C and HIV were offered rituximab as an alternative to long-term steroid treatment. Patients were given 2 doses of 1000 mg of rituximab intravenously 2 weeks apart. The severity of the eye disease was calculated at the start of the study and at 4, 8, 16, 24, 36 and 52 weeks according to 2 different scores, the Clinical Activity Score (CAS) and the Thyroid Associated ophthalmopathy scale (TAOS), each of which measures the severity of different parameters of disease activity.

WHAT WERE THE RESULTS OF THE STUDY?

Twelve patients with active TED were treated with rituximab. There were no acute or long term adverse effects of the rituximab infusions. There was a significant improvement in CAS scores beginning 1 month after infusion of rituximab that was maintained during the 12-month observation period. There also was a significant improvement in the TAOS score during the course of the study. All patients had some improvement in their severe TED. The thyroid antibody and TSH levels did not change at any point during the study.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

This is a first study examining the effect of rituximab on TED. One case report showed that rituximab produced marked improvement in the eye symptoms in a patient with severe TED. Two studies in patients with Graves disease showed that rituximab was effective in inducing remission in some of the patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Rituximab appears to be a promising, safe and effective alternative to long-term steroid treatment in patients with severe TED. More studies with larger numbers of patients are needed.

— M. Regina Castro, MD

ATA THYROID BROCHURE LINKS

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

continued on next page



GRAVES' OPTHALMOPATHY, continued

ABBREVIATIONS & DEFINITIONS

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.

Hashimoto's thyroiditis — the most common cause of hypothyroidism in the United States. It is caused by antibodies that attack the thyroid and destroy the gland.

Thyroid eye disease (TED) — also known as Graves ophthalmopathy. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. TED includes inflammation of the eyes, eye muscles and the surrounding tissues. Symptoms include dry eyes, red eyes, bulging of the eyes and double vision.

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.

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.

Rituximab — a selective immunosuppressive drug that is administered intravenously and which is directed against B lymphocytes (cells of the immune system).

Steroids/Glucocorticoids — general antiinflammatory and immunosuppressive drugs that are commonly used for the treatment of many autoimmune diseases associated with inflammation.

CAS — Clinical Activity Score, a scoring system used to evaluate patients with Graves' ophthalmopathy. It is based on classical signs of inflammation (pain, redness, swelling and function) and helps predict which patients will benefit from certain medications.

TRAb — antibodies often present in the serum of patients with Graves disease that are directed against the TSH receptor, often causing stimulation of this receptor with resulting hyperthyroidism.

Thyroid stimulating immunoglobulin /TSI — antibodies often present in the serum of patients with Graves' disease that are directed against the TSH receptor, that cause stimulation of this receptor resulting in increased levels of thyroid hormones in the blood and hyperthyroidism.

Antibodies — proteins that are produced by the body's immune cells that attack and destroy bacteria and viruses that cause infections. Occasionally the antibodies get confused and attack the body's own tissues, causing autoimmune disease.

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



THYROID CANCER

The decrease in serum calcitonin concentrations after surgery in patients with medullary thyroid cancer identifies patients with persistent cancer

WHAT IS THE STUDY ABOUT?

Medullary cancer is a rare form of thyroid cancer, accounting for <10% of all thyroid cancers. Unlike the more common papillary and follicular thyroid cancer, medullary thyroid cancer does not respond to radioactive iodine, so the main treatment option is surgery. Thus, the prognosis of medullary thyroid carcinoma depends greatly on the completeness of the first surgical treatment. However, whether removal of all the lymph nodes in the central neck should be performed at the time of surgery is a matter of debate unless there are abnormal looking lymph nodes present. Calcitonin is a hormone that is secreted by medullary cancer cells and serves as a cancer marker. The aim of this study was to determine if measurement of calcitonin during surgery is an effective predictor of residual cancer in patients with medullary thyroid cancer.

THE FULL ARTICLE TITLE:

Faggiano A et al. A decrease of calcitonin serum concentrations less than 50 percent 30 minutes after thyroid surgery suggests incomplete C-cell tumor tissue removal. *J Clin Endocrinol Metab* 2010. 0-0045 [pjc.2011i];10.1210/jc.2010-0045[doi].

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine if measurement of calcitonin during surgery is an effective predictor of residual cancer in patients with medullary thyroid cancer.

WHO WAS STUDIED?

The study subjects included 20 patients, 9 men and 11 women referred for surgery on the basis of elevated calcitonin levels.

HOW WAS THE STUDY DONE?

Neck ultrasonography identified thyroid nodules on all of the patients and ultrasound-guided fine-needle aspiration biopsy was performed on thyroid nodules with features suspicious for cancer. All patients had total thyroidectomy

and removal of lymph nodes from the center of the neck. After surgery, calcitonin was measured every 3 – 6 months.

WHAT WERE THE RESULTS OF THE STUDY?

Medullary cancer was found in 10 patients, and 10 others had C-cell hyperplasia. A total of 4 of the 20 patients had persistent cancer after surgery. Calcitonin levels fell in all patients after surgery. The average calcitonin decrease was 44% at 10 minutes after surgery and 61% at 30 minutes after surgery. The calcitonin decreased greater than 50% at 30 minutes after surgery in all 16 patients who had no evidence of persistent cancer. In the 4 patients who had persistent cancer after surgery, the calcitonin decrease at 30 minutes after surgery was 16-44%.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several studies have reported that calcitonin levels before surgery were predictive of postoperative calcitonin levels of patients with medullary thyroid cancer. This is the first study to show that post-operative calcitonin levels can predict the postoperative outcome of patients this type of cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that a decrease of calcitonin greater than 50% indicated that all of the cancer was removed, while persistent cancer was present if the decrease was less than 50%. This suggests that the surgeon should extend the operation to other lymph-node compartments in these latter patients.

— Alan P. Farwell, 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

continued on next page



THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

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

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.



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.





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

October 22 - 24, 2010 — San Diego, CA.

Graves' Disease Foundation 2010 Patient & Family Conference

Sponsored by Graves' Disease Foundation

Fall 2010 — San Diego, CA

Annual Meeting

Light of Life Foundation www.checkyourneck.com

ThyCa Conferences 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.