AMERICAN THYROID ASSOCIATION
ATA | Founded 1923

Clinical Thyroidology® for the Public

VOLUME 10 | ISSUE 12 | DECEMBER 2017

Because there are effective treatments for most forms of thyroid cancer leading to an overall excellent prognosis, some providers to refer to thyroid cancer as the "good cancer" to their patients. However, there is increasing awareness that patients and physicians often differ in how they perceive the seriousness and consequences of a particular illness. The goal of this study was to determine the reaction of selected patients with thyroid cancer to perceptions of their illness as conveyed to them by health care providers, their family members, and their support network.

Randle RW, et al Papillary thyroid cancer: the good and bad of the "good cancer." Thyroid 2017;27:902-7. Epub June 12, 2017.

Women with untreated hypothyroidism during pregnancy are at risk of having a miscarriage and complications such as premature birth and low birth weight babies. However, universal screening for hypothyroidism is very controversial and most guidelines support an approach of case-finding to test only those women who are truly at risk of hypothyroidism, such as those with symptoms. The following study was designed to determine the association between TSH levels and symptoms of hypothyroidism in women during early pregnancy.

Pop VJ et al. Thyroid disease symptoms during early pregnancy do not identify women with thyroid hypofunction that should be treated. Clin Endocrinol (Oxf). July 26, 2017 [Epub ahead of print].

Prematurity is one of the most important causes of death in newborns and babies. Research has shown that both hyperthyroidism and hypothyroidism are associated with poor outcomes for the mother and the developing newborn, including premature delivery. This study aimed to determine whether mild variations of thyroid function during pregnancy are associated with preterm delivery in women without thyroid disease.

Johns LE et al. Longitudinal profiles of thyroid hormone parameters in pregnancy and associations with preterm birth. PLoS One 2017;12: e0169542.

While thyroid nodules are a common medical problem, 90-95% of nodules are benign. Given the high frequency of thyroid nodules with a low risk of cancer, it is important to rank thyroid nodules based on their risk of being a cancer to detect thyroid cancer and avoid unnecessary biopsy in benign nodules. The 2015 ATA guidelines suggest ranking the cancerous potential of thyroid nodules based on their ultrasound appearance. The goal of this study was to validate ATA risk ranking system for thyroid nodules measuring 1 to 2 cm.

Lee JH et al. Validation of the modified 4-tiered categorization system through comparison with the 5-tiered categorization system of the 2015 American Thyroid Association guidelines for classifying small thyroid nodules on ultrasound. Head Neck. 2017 Nov;39(11):2208-2215.

Follicular variant of papillary thyroid carcinoma (FVPTC) is one of the subtypes of papillary thyroid carcinoma, which has been classified to three different forms that vary on their aggressiveness. In this study the authors reviewed the thyroid ultrasound images that were obtained before thyroid surgery in patients with different types of FVPTC. The goal was to identify certain ultrasound characteristics specific to each subtype of FVPTC, which could potentially predict the type and thus invasiveness of FVPTC before thyroid surgery.

Hahn SY et al. Role of Ultrasound in Predicting Tumor Invasiveness in Follicular Variant of Papillary Thyroid Carcinoma. Thyroid 2017; 27: 1177-84.

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EDITOR'S COMMENTS

Welcome to another issue of *Clinical Thyroidology for the Public*. In this journal, we will bring to you the most up-to-date, cutting edge thyroid research. We also provide even faster updates of late-breaking thyroid news through Twitter at @thyroidfriends and on Facebook. Our goal is to provide patients with the tools to be the most informed thyroid patient in the waiting room.

The American Thyroid Association (ATA) extends its appreciation to all of the patients and their families that are part of the ATA community — our Friends of the ATA. It is for you that the ATA is dedicated to carrying out our mission of providing reliable thyroid information and resources, clinical practice guidelines for thyroid detection and treatments, resources for connecting you with other patients affected by thyroid conditions, and cutting edge thyroid research as we search for better diagnoses and treatment outcomes for thyroid disease and thyroid cancer.

As we think of all those who make a difference in our lives this holiday season, we thank you for being part of the ATA family and for all of the Friends of the ATA who support our mission and work throughout the year to support us. We invite you to help keep the ATA mission strong by choosing to make a donation that suits you — it takes just one moment to give online at: www.thyroid.org/donate and all donations are put to good work. The ATA is a 501(c)3 nonprofit organization and your gift is tax deductible.

The editorial board of CTFP, the ATA Board of Directors, Members, and ATA Headquarters Staff, wish you the best this season and look forward to being part of your thyroid network in 2018.

December is Thyroid and Development Awareness Month.

In this issue, the studies ask the following questions:

- Does calling thyroid cancer the "good cancer" do more harm than good?
- How well do hypothyroid symptoms predict hypothyroidism in pregnant women?
- Do changes of thyroid function tests during pregnancy predict premature delivery?
- How well do the ATA guidelines do on classifying the risk of cancer in thyroid nodules based on ultrasound findings?
- Can ultrasound predict how invasive is papillary 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, FACE

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THYROID CANCER

Is it appropriate to refer to thyroid cancer as the "good cancer" in discussions with patients with thyroid cancer?

BACKGROUND

Thyroid cancer is the fastest rising cancer, especially in women. Fortunately, there are effective treatments for most forms of thyroid cancer leading to an overall excellent prognosis for thyroid cancer patients. This has led to some providers to refer to thyroid cancer as the "good cancer" to their patients. However, there is increasing awareness that patients and physicians often differ in how they perceive the seriousness and consequences of a particular illness. Less information is available regarding how these differences affect the interaction of patients with their health care providers and others. The goal of this study was to determine the reaction of selected patients with thyroid cancer to perceptions of their illness as conveyed to them, directly or indirectly, by health care providers, their family members, and their support network.

THE FULL ARTICLE TITLE

Randle RW, et al Papillary thyroid cancer: the good and bad of the "good cancer." Thyroid 2017;27:902-7. Epub June 12, 2017.

SUMMARY OF THE STUDY

Study patients were already participating in a thyroid cancer clinical trial. All had a preoperative diagnosis or suspicion of papillary thyroid cancer on the basis of ultrasound and thyroid biopsy. Patients were interviewed by 10 trained interviewers who were not members of the clinical staff. Interviews were conducted at the time of the patient's pre-thyroidectomy clinic visit, 2 weeks after surgery, and 6, 26, and 52 weeks post- thyroidectomy. "Good cancer" was a theme that emerged unprompted from the interviews at multiple time points.

A total of 31 participants with thyroid cancer (7 men and 24 women) underwent the 113 interviews that were included in the analysis. They ranged from 22 to 67 years in age. The average size of their cancers was 1.5 cm. In approximately half (46%) of their interviews, the theme of papillary thyroid cancer being widely considered to be a good cancer emerged unprompted from almost all (94%) of the interviewed participants. Discussion relating to papillary thyroid cancer being regarded as a good cancer was most common (50%) during the preoperative interview. A total of 14 participants brought up the theme of thyroid cancer being a good cancer during more than one interview.

Reactions of patients to their perception that they were viewed as having a good type of cancer were mixed. A total of 14 patients were interviewed at all of the five scheduled times prior to and up to 1 year after thyroid surgery. The comments of three patients were consistently indicative that they were glad to receive the message that they had a cancer with a good prognosis. A total of 5 patients were either positive or at other times neutral to being perceived as having a "good cancer," and 4 patients were at times negative and other times positive. Two patients had a consistently negative response to the good cancer theme. Some patients expressed gratitude that they had been told that the thyroid cancer they had was one of the best to have. Others conveyed the impression that "the most pervasive negative impact of 'good cancer' themes were its tendency to invalidate and diminish the struggles of thyroid cancer patients."

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study confirms that there is often a disconnect with patients in the message of thyroid cancer being a "good cancer". This message comes from their presurgical and postsurgical interactions with health care providers, family and friends, and information on the Internet and in the media. In some such patients, the impression that their cancer is considered to be a good cancer is consistently viewed as being a positive experience. However, in the majority of patients, the good cancer theme does not reliably produce positive emotions and, in a few, it may consistently evoke negative feelings. This is important to consider and suggested that providers should largely refrain from calling thyroid cancer the "good cancer".

— Alan P. Farwell, MD, FACE

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THYROID CANCER, continued

ATA THYROID BROCHURE LINKS

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

Thyroid Cancer (Medullary): https://www.thyroid.org/medullary-thyroid-cancer/

ABBREVIATIONS & DEFINITIONS

Thyroid nodule: an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

Thyroid fine needle aspiration biopsy: 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.

Papillary thyroid cancer: the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

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THYROID AND PREGNANCY

Hypothyroid symptoms in pregnant women fail to predict hypothyroid status

BACKGROUND

Women with untreated hypothyroidism during pregnancy are at risk of having a miscarriage and of experiencing other complications such as premature birth and low birth weight babies. In addition, decreased availability of thyroid hormone from hypothyroidism in the mother may delay brain development in the fetus. Since treatment with levothyroxine can prevent many of these complications, it is important to identify women who have hypothyroidism (or are at high risk of developing hypothyroidism) early during a pregnancy so that treatment can be initiated. One way to accomplish this would be to simply test all women seeking pregnancy or who are newly pregnant for hypothyroidism with a serum TSH level; a high TSH level (along with a low free T_4 level) would indicate overt hypothyroidism and identify women at the highest risk of having problems during pregnancy. However, universal screening is very controversial and most guidelines, including the those published by the American Thyroid Association, support an approach of aggressive case-finding using specific criteria to identify and subsequently test only those women who are truly at risk of hypothyroidism.

One of the case-finding criteria that may lead to further testing is whether a pregnant woman has current symptoms or signs of hypothyroidism. However, symptoms of hypothyroidism such as fatigue, weight gain and constipation are very common and may be the result of pregnancy itself, as opposed to from true hypothyroidism. Consequently, the following study was designed to determine the association between TSH levels and symptoms of hypothyroidism in women during early pregnancy.

THE FULL ARTICLE TITLE

Pop VJ et al. Thyroid disease symptoms during early pregnancy do not identify women with thyroid hypofunction that should be treated. Clin Endocrinol (Oxf). July 26, 2017 [Epub ahead of print].

SUMMARY OF THE STUDY

The investigators administered a questionnaire at the first 12-week appointment of 2198 pregnant women in the Netherlands who did not have a history of thyroid dysfunction, autoimmune disease, twin or in-vitro fertilization pregnancy and who were not taking medications that interfere with thyroid function. The questionnaire used a 5 point scale to assess for the presence of symptoms typical of hypothyroidism. Participants also had blood tests for serum TSH, Free T_4 and thyroid peroxidase (TPO) antibody levels measured around the same time. The authors defined "treatment requiring hypothyroidism" as those with high TSH and low free T_4 level (called overt hypothyroidism) as well as those with normal T_4 but a TSH level over 10mIU/L (called subclinical hypothyroidism). They then compared those who reported high scores based on the questionnaire with those who had treatment requiring hypothyroidism based on the blood tests

A total of 302 women reported high symptom scores for hypothyroidism based on the questionnaire and 15 women (0.7% of entire group) had treatment requiring hypothyroidism based on blood tests. Only 1 of the 302 women with a high symptom score was actually found to have treatment requiring hypothyroidism. As such high symptom scores for hypothyroidism did not predict true hypothyroidism based on blood tests.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that symptoms alone, in the absence of laboratory tests, do not predict hypothyroidism in pregnant women. Many of the symptoms of hypothyroidism overlap with the symptoms of pregnancy and, as such, clinicians must evaluate for other risk factors of hypothyroidism in order to identify pregnant women who should receive screening blood tests.

— Philip Segal, MD

THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

Thyroid Disease and Pregnancy: https://www.thyroid.org/thyroid-disease-pregnancy/

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

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

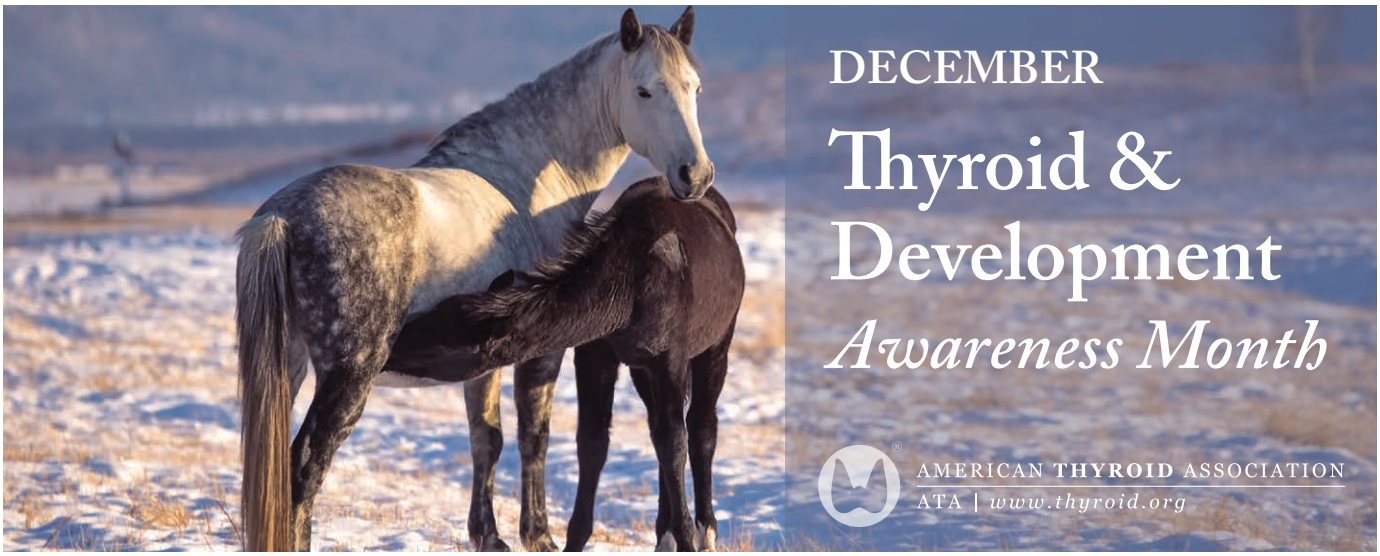
ABBREVIATIONS & DEFINITIONS

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

Thyroxine (T4): the major hormone produced by the thyroid gland. T_4 gets converted to the active hormone T_3 in various tissues in the body.

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.

Levothyroxine (T4): the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tyrosint™ and generic preparations.



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THYROID AND PREGNANCY

Thyroid hormone levels during pregnancy may be associated with premature delivery

BACKGROUND

Prematurity, or delivery before the baby is ready to be born, is one of the most important causes of death in newborns and babies. It is also associated with major health problems later in life, leading to long term health and economic costs. Prevention of preterm delivery is difficult as the factors involved in causing premature birth are not well understood. Thyroid hormone level in the mother are very important in the growth and development of the baby, especially early in pregnancy. Thyroid hormones are also important for the normal development of the placenta, a critical component to maintain pregnancy. Research has shown that high thyroid hormone levels (hyperthyroidism) or low thyroid hormones (hypothyroidism) are associated with poor outcomes for the mother and the developing newborn. However, most studies have not followed levels during pregnancy and have only checked levels once during the first or the second trimester of pregnancy. In addition, the influence of mild thyroid dysfunction is not known. This study aimed to determine whether mild variations of thyroid function, measured four times during pregnancy, are associated with preterm delivery in women without thyroid disease.

THE FULL ARTICLE TITLE

Johns LE et al. Longitudinal profiles of thyroid hormone parameters in pregnancy and associations with preterm birth. PLoS One 2017;12: e0169542.

SUMMARY OF THE STUDY

Women were recruited before 15 weeks of pregnancy at the Brigham and Women's hospital in Boston. A total of 130 women who delivered babies before 37 weeks of gestation (premature deliveries) were cases and 352 women were controls. Women who had thyroid disease before or during pregnancy were excluded (41 women). Samples were collected up to four times during pregnancy, at a 10, 18, 26, and 35 weeks of gestation. TSH, active, free T_4 (FT_4), Total T_4, and total T_3 were measured. They studied the difference in the changes of thyroid-function measurements and the association of thyroid function at each time point with premature birth. The final study population included 116 patients with preterm birth and 323 controls, for which 1443 blood samples were available.

The mothers were predominantly white, highly educated, nonsmokers, and either were pregnant for the 1st or 2nd time. Results showed significant differences in the changes of TSH, FT_4, T_4, and T_3 between the cases and controls. Notably, during normal pregnancy, there is a decrease in TSH during early pregnancy, which was seen in the control women but not in the women who delivered premature babies. Also, FT_4 concentrations were lower during early pregnancy in cases than in controls. For total T_4 and total T_3 concentrations, controls displayed a larger increase during early pregnancy than cases. Levels were similar after week 15 of pregnancy. When analyses were done per measurement, higher FT_4 concentrations at weeks 10 and 26 showed a protective effect, while these analyses indicated that higher total T_4 and total T_3 concentrations were associated with a higher risk of prematurity.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors conclude that changes of thyroid function over time during pregnancy are associated with premature delivery. The study shows that the changes seen normally during pregnancy are important determinants for normal pregnancy. As noted, women who delivered premature babies did not have the usual decrease in TSH and had lower FT_4 levels in early pregnancy. It is possible that these variations are critical in the early development of the placenta. If these results can be confirmed, this study may have impact in the care of pregnant women in the future.

— Liuska Pesce, MD

THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): https://www.thyroid.org/hyperthyroidism/
Hypothyroidism (Underactive): https://www.thyroid.org/hypothyroidism/
Thyroid Disease and Pregnancy: https://www.thyroid.org/thyroid-disease-pregnancy/
Thyroid Function Tests: https://www.thyroid.org/thyroid-function-tests/

ABBREVIATIONS & DEFINITIONS

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

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.

Thyroxine (T4): the major hormone produced by the thyroid gland. T_4 gets converted to the active hormone T_3 in various tissues in the body.

Triiodothyronine (T3): 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.

Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of **December** is **Thyroid and Development Awareness Month** and a bracelet is available through the **ATA Marketplace** to support thyroid cancer awareness and education related to thyroid disease.

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THYROID NODULES

Large study confirms the 2015 American Thyroid Association guidelines for classifying small thyroid nodules on ultrasound

BACKGROUND:

Thyroid nodules are a common medical problem affecting up to 65% of the population in the United States, especially women and older age groups. Thyroid nodules are being diagnosed more often at present, because of increasing use of medical imaging such at CT scans and MRIs. Ultrasound-guided fine-needle biopsy is the most accurate and cost-effective test available to differentiate between benign and cancerous thyroid nodules. Fortunately, 90-95% of nodules are benign. Given the high frequency of thyroid nodules with a low risk of cancer, it is important to rank thyroid nodules based on their risk of being a cancer to detect thyroid cancer and avoid unnecessary biopsy in benign nodules.

The 2015 American Thyroid Association (ATA) guidelines suggest ranking the cancerous potential of thyroid nodules in five groups based on their ultrasound appearance: group A, highly suspicious nodules with estimated risk of cancer higher than 70–90%; group B with intermediate cancer risk of 10–20%; group C with low cancer risk of 5–10%, group D with very low cancer risk of 3%, and group E, clearly benign nodules with risk of less than 1%. Based on their predicted cancer potential, biopsy to detect cancer is recommended for thyroid nodules 1 cm or larger in groups A and B, 1.5 cm or larger in group C, and 2 cm or larger in group D. The ATA ranking system has not yet been validated in a large series. The goal of this study was to validate this five-group risk ranking system for thyroid nodules measuring 1 to 2 cm.

THE FULL ARTICLE TITLE:

Lee JH et al. Validation of the modified 4-tiered categorization system through comparison with the 5-tiered categorization system of the 2015 American Thyroid Association guidelines for classifying small thyroid nodules on ultrasound. Head Neck. 2017 Nov;39(11):2208-2215.

SUMMARY OF THE STUDY:

A total of 2749 thyroid nodules in 2552 patients underwent ultrasound-guided biopsy between January 2015 and December 2015 at a single South Korean institution. Using the recorded ultrasound features, such as composition, echogenicity, margin, calcification, and shape, the nodules were classified according to the 2015 ATA five-group risk ranking system. Of all 2749 thyroid nodules, 964 nodules in 915 patients measured between 1 and 2 cm. Among these, 147 nodules were surgically removed, and 590 nodules that were not excised had benign or cancer results on biopsy; these two groups were included in the study. Of the total of 737 thyroid nodules in 723 patients, 162 (22%) were cancerous and 575 (78%) were benign. The average age of the patients was 51 years, and the average size of the nodules was 14 mm.

Using the ATA five-group ranking system, the cancer rate was 58% in group A/high suspicion, 6.5% in group B/intermediate, 2.1% in group C/low and 1.3 % in group D/very low. Since there was no statistical difference between the cancer rates of the low/C and very low/D risk groups, the authors proposed to combine these two groups in one category in a modified four-group stratification system. Biopsy of nodules 2 cm or larger was proposed for the revised low suspicion group.

When comparing their diagnostic performance, the modified four-group system performed better overall than the five-group ATA system. With the revised 4-group ranking system, a larger number of unnecessary biopsies in benign nodules could be avoided.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This is one of the first large series to validate that the 2015 ATA risk assessment system for thyroid nodules measuring between 1 and 2 cm effectively differentiates nodules with high, intermediate, and low risk of cancer based on their ultrasound appearance. The proposed modified four-group risk stratification system is easier to use and suggests that fewer nodules should undergo biopsy; however, it needs further confirmation in other studies.

— Alina Gavrila, MD, MMSC

THYROID NODULES, continued

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

Thyroid nodule: an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (benign), 5-10% are cancerous (malignant).

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.

Echogenicity: the ability of a thyroid nodule to reflect or transmit ultrasound waves.

Thyroid fine needle aspiration biopsy: 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.

Calcification: small or large fleck of calcium that can be seen either inside a thyroid nodule or in the periphery, usually seen as bright spots on ultrasonography.

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THYROID CANCER

The role of ultrasound in predicting thyroid cancer invasiveness

BACKGROUND

Papillary thyroid carcinoma is the most common form of thyroid cancer. Follicular variant of papillary thyroid carcinoma (FVPTC) is one of the subtypes of papillary thyroid carcinoma, which has been classified to three different forms: non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP), invasive encapsulated (iE-FVPTC) and infiltrative FVPTC (I-FVPTC). In contrast to iE-FVPTC, there is no evidence of invasion of thyroid cancer cells into blood vessels or the nodule capsule in NIFTP. The important feature of I-FVPTC is the lack of a complete capsule around the nodule. Each one of these types is associated with a different prognosis; for example NIFTP is a non-invasive tumor without risk of spread outside the thyroid; iE-FVPTC is a low risk cancer and I-FVPTC is the most aggressive variant.

Ultrasound has an important rule in evaluation of thyroid nodules. Different types of thyroid cancer have various characteristics in ultrasound images. In this study the authors reviewed the thyroid ultrasound images that were obtained before thyroid surgery in patients with different types of FVPTC. The goal was to identify certain ultrasound characteristics specific to each subtype of FVPTC, which could potentially predict the type and thus invasiveness of FVPTC before thyroid surgery.

THE FULL ARTICLE TITLE

Hahn SY et al. Role of Ultrasound in Predicting Tumor Invasiveness in Follicular Variant of Papillary Thyroid Carcinoma. Thyroid 2017; 27: 1177-84.

SUMMARY OF THE STUDY

The authors reviewed the thyroid ultrasound images of 151 individuals who had thyroid surgery and were found to have FVPTC. The ultrasounds were done prior to surgery between January-2014 to May-2016. The average age of patients were 49 year old. Two radiologists who were unaware of final diagnosis after thyroid surgery studied the ultrasound images. They used the previously published criteria and divided the thyroid nodules into groups based on the degree of suspicious for thyroid carcinoma (from very low risk for thyroid cancer to high risk). A total of 152 thyroid nodules were found to be FVPTC after surgery; 31.6% were NIFTP, 39.5% were iE-FVPTC and 28.9% were I-FVPTC.

They found that I-FVPTCs were significantly smaller than the other types. While some of the ultrasound characteristics were similar between these cancers, others were different. The thyroid nodules that were found to be I-FVPTC had irregular shape and margin as well as small calcium deposits more often than NIFTP and iE-FVPTC (which were round or oval with regular margin and often with a halo around them).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that ultrasound could be beneficial to estimate the invasiveness of thyroid nodules before surgery. This could be important because a patient who has a thyroid nodule with highly suspicious features suggestive for an invasive cancer can consider total thyroidectomy; however in the absence of suspicious features, a lobectomy can be performed.

— Shirin Haddady, MD MPH

ATA THYROID BROCHURE LINKS

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

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

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

THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer: the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

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

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.

Total thyroidectomy: surgery to remove the entire thyroid gland.

Lobectomy: surgery to remove one lobe of the thyroid.

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ATA Alliance for Thyroid Patient Education

GOAL

The goal of our organizations is to provide accurate and reliable information for patients about the diagnosis, evaluation and treatment of thyroid diseases.

We look forward to future collaborations and continuing to work together toward the improvement of thyroid education and resources for patients.

WHO WE ARE (in alphabetical order)

AMERICAN THYROID ASSOCIATION
www.thyroid.org
ATA Patient Resources:
http://www.thyroid.org/thyroid-information/
Find a Thyroid Specialist: www.thyroid.org
(Toll-free): 1-800-THYROID
thyroid@thyroid.org

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GRAVES' DISEASE AND THYROID FOUNDATION
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(Toll-free): 877-643-3123
info@ngdf.org

LIGHT OF LIFE FOUNDATION
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THYCA: THYROID CANCER SURVIVORS' ASSOCIATION, INC.
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AMERICAN THYROID ASSOCIATION
FOUNDED 1923

Light of Life Foundation
checkyourneck.com

GRAVES' DISEASE & THYROID FOUNDATION

Thyroid Federation International

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

Thyroid Cancer Canada
Cancer de la thyroïde Canada

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FOUNDED 2005

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"The ATA was a valuable resource for our family when my dad was diagnosed with Anaplastic Thyroid Cancer. When you're faced with a detrimental diagnosis where even a few days can make the difference in life or death, understanding your options quickly is critical. The ATA website offers a one-stop shop for patients and caregivers to find specialists, current clinical trials, general thyroid cancer information, and links to other patient support groups and information."

Mary Catherine Petermann
- Father who was diagnosed with Anaplastic Thyroid Cancer in 2006
- He was treated at Mayo Clinic
- He has clean scans as of October 2016

PLEASE JOIN OUR JOURNEY TO ADVANCED DISCOVERIES AND TREATMENT FOR THYROID DISEASE AND THYROID CANCER

As patients with thyroid disease navigate the challenges to their quality of life and researchers and physicians look for more effective directions, we at the ATA have our own destination– **funding for critical thyroid research, prevention, and treatment.** For 94 years, the ATA has led the way in thyroidology. It's a daily obstacle course to find new drugs, better treatments, advanced surgical methods, and more rapid diagnoses for the 20 million Americans who have some form of thyroid disease.

The ATA has paved the way with management guidelines for clinicians who diagnose and treat thyroid disease. For physicians treating pregnant women diagnosed with thyroid disease, our recent publication presents 97 evidence-based recommendations making sure that best practices are implemented with the latest, most effective treatment.

Through your generous support and donations, research takes the lead and hope is on the horizon. **Will you join us** in our campaign to raise **$1.5 million** for thyroid research, prevention, and treatment? Your compassionate, tax-deductible gift will provide funds for:

- Research grants that pave the way for 1,700 ATA physicians and scientists who have devoted their careers to understanding the biology of and caring for patients affected by thyroid disease.
- Patient education for individuals and families looking for life-changing clinical trials, the best thyroid specialists, and cutting edge treatment and drugs.
- Professional education that offers a wealth of knowledge and leading-edge research for trainees and practitioners.
- A website that is the go-to resource for thyroid information for patients and practitioners alike. In 2016 alone, there were more than 3,700,000 website views of ATA's library of online thyroid information patient brochures.

Donations **of all sizes** will change the future for thyroid patients. You will make a direct impact on patients like Mary Catherine's father as he deals with Anaplastic Thyroid Cancer. You will help scientists like ATA Associate Member Julia Rodiger, Ph.D., a scientist at the National Institutes of Health, as she analyzes thyroid hormones for intestinal stem cell development.

Congenital Hypothyroidism

WHAT IS THE THYROID GLAND?

The thyroid gland is a butterfly-shaped endocrine gland that is located in the lower front of the neck, just above the collarbone. The thyroid's job is to make thyroid hormones, which are released into the blood and then carried to every tissue in the body. In children, thyroid hormone helps to ensure that growth and development occur normally and that the body's energy, metabolism, heart, muscles, and other organs are working properly.

WHAT DOES THYROID HORMONE DO?

Thyroid hormone plays an important role in growth and development. Before a baby is born and up to 2 to 3 years of life, thyroid hormone is very important for brain development. After this time, thyroid hormone is important for growth as well as enabling the body to use energy and stay warm (metabolism) and to help the brain, heart, muscles, and other organs work as they should.

WHAT IS CONGENITAL HYPOTHYROIDISM?

When thyroid hormone deficiency is detected at birth it is called "congenital hypothyroidism". Babies with congenital hypothyroidism are born with an underactive or absent thyroid gland. Because thyroid hormone plays such an important role in brain development and growth, all babies born in the United States, Canada and other developed countries undergo a screening test to check thyroid function shortly after birth. Early detection and treatment of hypothyroidism generally results in normal growth and development.

WHAT CAUSES CONGENITAL HYPOTHYROIDISM?

The most common causes of congenital hypothyroidism are:

1. A thyroid gland in an abnormal location (ectopic thyroid gland)
2. An underdeveloped thyroid gland (thyroid hypoplasia)
3. A missing thyroid gland (thyroid agenesis)

- As a group, these abnormalities are called *thyroid dysgenesis* and are usually not inherited from parents; there is a low chance that additional children will have the same problem.
- Another explanation for congenital hypothyroidism is that the thyroid is in a normal location but it cannot make a normal amount of thyroid hormone. This is called *thyroid dyshormonogenesis*. This form of congenital hypothyroidism may be inherited with a 25% chance (1 in 4) that a future baby from the same parents will have the same, treatable problem.

LESS COMMON CAUSES ARE:

- A "thyroid blocking antibody" passed from mother to the baby during pregnancy; mothers who have *Hashimoto's thyroiditis* may produce this "blocking antibody". The baby may need thyroid hormone treatment, but this form of congenital hypothyroidism is often temporary, lasting a few weeks to months.
- Medications taken by mother during pregnancy. The most common is an "anti-thyroid drug" that is used for the treatment of *Graves' disease* (hyperthyroidism). If a mom ingests extremely high doses of iodine from the diet or from a supplement this may also result in congenital hypothyroidism.
- The baby cannot make the signal from the brain (pituitary gland) to tell the thyroid to work. This signal is called thyroid stimulating hormone (TSH). This may be associated with other pituitary hormone deficiencies. Additional hormone levels and brain imaging will be performed based on the clinical situation

WHAT ARE THE SIGNS AND SYMPTOMS OF CONGENITAL HYPOTHYROIDISM?

Most babies have no obvious signs or symptoms of thyroid hormone deficiency at birth. This is why newborn screening is so important. Other babies may have some of the following features either at birth or developing slowly over the first few months of life:

- A puffy-looking face
- Large, thick tongue
- Large soft spots of the skull
- Hoarse cry
- Distended stomach with outpouching of the belly button (umbilical hernia)
- Feeding problems, including needing to be awakened for feedings and difficulty swallowing
- Constipation
- "Floppy" (poor muscle tone, also called hypotonia)
- Jaundice (a yellow appearance of the skin and eyes)

Congenital Hypothyroidism

HOW IS CONGENITAL HYPOTHYROIDISM DIAGNOSED?

Babies in the United States, Canada and many other countries are tested for congenital hypothyroidism as part of the standard newborn screening program. A heel–prick blood sample is obtained at 1-2 days of age and mailed to the state screening laboratory. The screening laboratory will measure the level of:

- T4 (thyroxine)
- TSH (thyroid stimulating hormone)

If the heel-prick blood T4 level is low and the TSH is elevated, the results suggest congenital hypothyroidism. These results are sent to the baby's primary care provider. The screening test results must be confirmed by another blood test, one that is taken directly from a vein, not a repeat heel-prick. This test will also measure T4 (more often a "free T4") and TSH. If the free T4 is low and the TSH is elevated, a diagnosis of congenital hypothyroidism is confirmed. The doctor may also recommend some form of imaging, such as an ultrasound exam or thyroid scan, to look for a specific cause of congenital hypothyroidism.

HOW IS CONGENITAL HYPOTHYROIDISM TREATED?

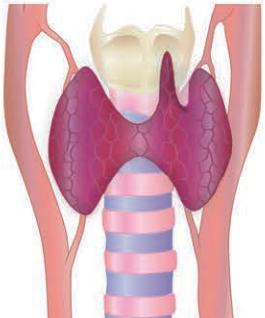
Treatment involves replacing the missing thyroid hormone to restore thyroid hormone levels to normal. The common form of thyroid hormone, considered the best treatment, is called levothyroxine (although it is synthetic, it is identical to theT4 produced by the body). Currently levothyroxine is only available in tablet form. Parents should crush up each day's tablet, and then mix with a small volume (about 1 tsp) of liquid, either expressed breastmilk, water, or formula. This can be given to the baby on a teaspoon or by using a medicine dropper or syringe and squirting the suspension into the baby's mouth (against the side or cheek pad). Levothyroxine should not be mixed with a soy protein formula, as soy protein binds thyroid hormone, reducing absorption from the gut. It is extremely important that parents administer thyroid hormone daily to maintain steady blood levels. In order to do this, parents must fill their baby's levothyroxine prescription in a timely manner, and let their doctor know if they need a refill. Some pharmacists may suggest that they can make a 'suspension' for the baby. These preparations are not stable and they should NOT be used.

HOW OFTEN ARE BLOOD LEVELS CHECKED?

An important part of treatment involves monitoring of blood thyroid hormone levels (TSH and free T4) to make sure that the amount of medication is adjusted to keep up with how fast the baby is growing. Generally, blood tests are checked every 1 to 2 months up to 6 months of age and then every 2 to 3 months thereafter. In general, it is recommended that babies with congenital hypothyroidism be managed in consultation with a pediatric endocrine specialist. The primary care provider or the pediatric endocrine specialist will give instructions for how often the blood tests are monitored.

IS LIFELONG TREATMENT NECESSARY?

For many babies, thyroid hormone replacement therapy will be needed for their entire life. With proper treatment, these children can lead healthy and happy lives, with normal growth and development, and no restrictions as far as activities. For some babies, thyroid hormone deficiency is transient, with treatment required for several months to a few years. In cases where congenital hypothyroidism is thought to be temporary, the baby's doctor (endocrinologist) may recommend a trial off levothyroxine treatment after age 3 years (after the time of critical brain development). Once off of the medication, repeat blood tests to measure the TSH and free T4 levels will help determine if the baby can stay off of thyroid hormone replacement or whether it needs to be restarted.



FURTHER INFORMATION

Further details on this and other thyroid-related topics are available in the patient thyroid information section on the American Thyroid Association® website at *www.thyroid.org*.

For information on thyroid patient support organizations, please visit the *Patient Support Links* section on the ATA website at *www.thyroid.org*