

# CLINICAL THYROIDOLOGY FOR PATIENTS



AMERICAN  
THYROID  
ASSOCIATION  
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## THYROID AND PREGNANCY

Thyroid hormone is very important for the baby to develop normally. Thyroid problems in the mother have been associated with both developmental problems in the baby and unfavorable pregnancy outcomes. The presence of anti-thyroid antibodies is common in people with thyroid problems (particularly hypothyroidism) and has also been linked to problems carrying out a successful pregnancy. This study examined the effect of thyroid problems and the presence of anti-thyroid antibodies on pregnancy outcomes.

Männistö T, Väärasmäki M, Pouta A, Hartikainen AL, Ruokonen A, Surcel HM, Bloigu A, Järvelin MR, Suvanto-Luukkonen E. Perinatal outcome of children born to mothers with thyroid dysfunction or antibodies: a prospective population-based cohort study. *J Clin Endocrinol Metab* 2009;94:772-9.....3

## HYPERTHYROIDISM

Down syndrome is the most common genetic form of mental retardation and the leading cause of certain birth defects and medical conditions. Thyroid disorders are common in patients with Down syndrome, with hypothyroidism occurring in almost 50%. There have been a few cases reported of hyperthyroidism in these patients. The aim of this study was to determine how common hyperthyroidism was in a population with Down syndrome and how these patients were diagnosed and treated.

Goday-Arno A, Cerda-Esteve M, Flores-Le-Roux JA, Chillaron-Jordan JJ, Corretger JM, Cano-Perez JF. Hyperthyroidism in a population with Down syndrome (DS). *Clin Endocrinol (Oxf)* 2009;71:110-4..... 5

## HYPERTHYROIDISM

Vasculitis is a generalized disorder of the immune system where antibodies attack blood vessels and cause inflammation. Drugs are a major cause of vasculitis, often by causing the development of specific antibodies known as myeloperoxidase antineutrophil cytoplasmic antibody (MPO-ANCA) which then attack blood vessels. The development of MPO-ANCA has been reported by both Methimazole (MMI) and Propylthiouracil (PTU), the two antithyroid drugs that are used in treating patients with hyperthyroidism. The aim of this study was to determine what doses of the drug are involved and what symptoms are the most common in patients with MPO-ANCA-associated vasculitis caused by PTU or MMI.

Noh JY, Yasuda S, Sato S, Matsumoto M, Kunii Y, Noguchi Y, Mukasa K, Ito K, Ito K, Sugiyama O, Kobayashi H,

Nihojima S, Okazaki M, Yokoyama S. Clinical characteristics of myeloperoxidase antineutrophil cytoplasmic antibody-associated vasculitis caused by antithyroid drugs. *J Clin Endocrinol Metab* 2009;94:2806-11..... 7

## THYROID CANCER

After surgery to remove the cancer, most thyroid cancer patients are treated with radioactive iodine (I-131, RAI) to destroy any remaining thyroid cells, both normal and cancerous. I-131 works because it is taken up by the normal and cancerous thyroid cells and, once inside, the radiation produced by the I-131 destroys the cell. The aim of the I-131 therapy is to achieve the highest radiation dose in thyroid tissue to destroy both remaining normal and cancerous thyroid cells with the lowest possible radiation exposure to the rest of the body. In an attempt to reduce the whole body radiation in patients, some physicians use water pills (diuretics) to increase the flow of urine from the kidneys and, hopefully, hasten the removal of I-131 from the body. This study was done to determine if diuretics are useful in reducing the whole body radiation produced by I-131 in patients with thyroid cancer.

Matovic MD, Jankovic SM, Jeremic M, Tasic Z, Vljakovic M. Whole-body radioiodine retention 72 hours after I-131 therapy is paradoxically higher in patients treated with furosemide and potassium chloride than in control group. *Thyroid* 2009;19:843-8..... 9

## THYROID CANCER

There has been a rapid increase in the number of new cases of papillary thyroid cancer over the last 30 years. Some studies suggest that microcarcinomas (cancers <1 cm) are much less likely to spread than larger cancers (>1 cm) while some suggest that size does not make any difference in cancer spread. This study looks at outcomes of patients with papillary microcancers as compared to those with those papillary cancers >1 cm (macrocarcinomas) in size.

Tzvetov G, Hirsch D, Shraga-Slutsky I, Weinstein R, Manistersky Y, Kalmanovich R, Lapidot M, Grozinsky-Glasberg S, Singer J, Sulkes J, Shimon I, Benbassat C. Well-differentiated thyroid carcinoma: comparison of microscopic and macroscopic disease. *Thyroid* 2009;19:487-94. .... 11

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# CLINICAL THYROIDOLOGY FOR PATIENTS

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## EDITOR'S COMMENTS

Welcome to *Clinical Thyroidology for Patients*. This publication is a collection of summaries of recently published articles from the medical literature that covers 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. The **Calendar of Events** highlights educational forums and support groups that are organized 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:

- Does the presence of thyroid antibodies affect pregnancy outcomes?
- Should patients with Down syndrome be screened for hyperthyroidism?
- What are the clinical features of vasculitis due to antithyroid drugs?
- Are diuretics helpful in reducing whole body radiation exposure after I-131 therapy for thyroid cancer?
- Are the outcomes in patients with thyroid cancers <1 cm in size different than outcomes in patients with larger thyroid cancers?

We welcome your feedback and suggestions. Please follow this [link](#) to let us know what you want to see in this publication. I hope you find these summaries interesting and informative.

—Alan P. Farwell, MD

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## THYROID AND PREGNANCY

# The Presence Of Anti-Thyroid Antibodies During The First Trimester Of Pregnancy Is A Major Risk For Perinatal Death

### WHAT IS THE STUDY ABOUT?

Thyroid hormone is very important for the baby to develop normally. During pregnancy, the mother's thyroid supplies thyroid hormone for the developing baby until the baby's thyroid begins to work on its own. Thyroid problems in the mother have been associated with both developmental problems in the baby and unfavorable pregnancy outcomes. For example, it appears that the rate of miscarriage is higher in mothers that are hypothyroid during their pregnancy. The presence of anti-thyroid antibodies is common in people with thyroid problems (particularly hypothyroidism) and has also been linked to problems carrying out a successful pregnancy. This study examined the effect of thyroid problems and the presence of anti-thyroid antibodies on pregnancy outcomes.

### THE FULL ARTICLE TITLE:

Männistö T, Vääräsmäki M, Pouta A, Hartikainen AL, Ruokonen A, Surcel HM, Bloigu A, Järvelin MR, Suvanto-Luukkonen E. Perinatal outcome of children born to mothers with thyroid dysfunction or antibodies: a prospective population-based cohort study. *J Clin Endocrinol Metab* 2009;94:772-9.

### WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to examine the effect of thyroid problems and the presence of thyroid antibodies on pregnancy outcomes.

### WHO WAS STUDIED?

The study included women from the Northern Finland Birth Cohort that delivered a single baby from July 1985 through June 1986. A total of 9247 women were included and 5805 had a blood sample available for analysis.

### HOW WAS THE STUDY DONE?

Pregnant women were enrolled in the study up until the 24th week of pregnancy and followed throughout their pregnancy. Blood levels of T<sub>4</sub>, TSH and anti-thyroid antibodies were obtained up to the 20th week of pregnancy.

Three questionnaires gathered information about general health, socioeconomic status, mother's health and

health behavior during the pregnancy and pregnancy outcomes. The women were separated into groups based on thyroid hormone levels (hypothyroid, hyperthyroid and normal) and the presence of anti-thyroid antibodies (positive or negative).

### WHAT WERE THE RESULTS OF THE STUDY?

Women with positive anti-thyroid antibodies had a 2-3 fold increase in perinatal death as compared to women with negative anti-thyroid antibodies. A number of infants that died in the perinatal period were born very early (before the 28th week of the pregnancy) which may have contributed to their death. Women with positive anti-thyroid antibodies were more likely to have a baby with abnormal birth weight, either higher than normal or lower than normal. Surprisingly, women with either hypothyroidism or hyperthyroidism did not have higher perinatal death rate than women with normal thyroid function in this study.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

Many studies have shown that severe hypothyroidism in the mother is associated with increased child death and risk for child death has been shown to be related to TSH levels, with higher levels being associated with higher child death rates. In contrast, this study shows that abnormal TSH values were not associated with increased child death rates. Another study showed that women with positive anti-thyroid antibodies were more likely to deliver early. This study extended those findings and showed that women with positive anti-thyroid antibodies are at risk for increased risk for perinatal death.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Women with positive anti-thyroid antibodies are at increased risk of perinatal death, possibly related to an increased risk of preterm (early) delivery. Identification of positive anti-thyroid antibodies may help target women that should be followed more closely to attempt to decrease preterm delivery.

— Whitney Woodmansee, MD

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## THYROID AND PREGNANCY, continued

### ATA THYROID BROCHURE LINKS

Thyroid and Pregnancy: [http://thyroid.org/patients/patient\\_brochures/pregnancy.html](http://thyroid.org/patients/patient_brochures/pregnancy.html)

Thyroid Function Tests: [http://thyroid.org/patients/patient\\_brochures/function\\_tests.html](http://thyroid.org/patients/patient_brochures/function_tests.html)

### 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 (T<sub>4</sub>):** 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.

**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.

**Anti-thyroid antibodies:** these are antibodies that attack the thyroid instead of bacteria and viruses and they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States. The two antibodies that are often measured are: anti-thyroid peroxidase (TPO) and anti-thyroglobulin (Tg).

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

**Fetal death:** this occurs when a baby dies later in pregnancy (usually after 22 weeks of pregnancy) before delivery.

**Perinatal death:** this occurs when a baby is born dead or dies in the first 7 days after being born (also referred to as early neonatal death).

**Neonatal death:** this occurs when a baby dies after birth.



## HYPERTHYROIDISM

# There Is An Increased Incidence Of Hyperthyroidism In Down Syndrome That Should Be Regularly Tested For At All Ages

### WHAT IS THE STUDY ABOUT?

Down syndrome is the most common genetic form of mental retardation and the leading cause of certain birth defects and medical conditions. Remarkably, Down syndrome patients share many similarities in appearance and in medical conditions regardless of their racial or ethnic background. Thyroid disorders are common in patients with Down syndrome, with hypothyroidism occurring in almost 50%. There have been a few cases reported of hyperthyroidism in these patients. It is unknown if hyperthyroidism is seen more often in patients with Down syndrome. The aim of this study was to determine how common hyperthyroidism was in a population with Down syndrome and how these patients were diagnosed and treated.

### THE FULL ARTICLE TITLE:

Goday-Arno A, Cerda-Esteva M, Flores-Le-Roux JA, Chillaron-Jordan JJ, Corretger JM, Cano-Perez JF. Hyperthyroidism in a population with Down syndrome (DS). *Clin Endocrinol (Oxf)* 2009;71:110-4.

### WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine how common hyperthyroidism was in a population with Down syndrome and how these patients were diagnosed and treated.

### WHO WAS STUDIED?

The study group included 1832 patients registered with the Catalan Down Syndrome Foundation in Spain. The information on these patients was obtained from January 1991 through February 2006.

### HOW WAS THE STUDY DONE?

The records of 1832 patients registered with the Catalan Down Syndrome Foundation in Spain were reviewed. The following information was gathered: age, vital signs, symptoms and physical examination, thyroid blood test results, thyroid scan results, ultrasound result and diagnosis.

### WHAT WERE THE RESULTS OF THE STUDY?

Among 1832 individuals with Down syndrome, 12 had hyperthyroidism, 5 of whom were male and 7 of whom were female, with ages ranging from 10.9 to 28.9 years.

The incidence of Graves' disease in the Down syndrome population was 43 cases per 10,000 persons per year, as compared with 24 cases per 100,000 persons per year in the population of Spain. The most common symptoms leading to a diagnosis of hyperthyroidism were increased heat intolerance and sweating (92%), increased emotional irritability (83%), a mean weight loss of 25.1 lb, palpitations (75%), insomnia (58%) and shaking of the hands (58%). The thyroid examination revealed diffuse thyroid enlargement in all the patients. All patients had undetectable serum TSH concentrations with elevated serum FT<sub>4</sub> concentrations and elevated serum total T<sub>3</sub> concentrations. Thyroid antibodies were present in 11 of 12 patients (92%). A thyroid scan showed diffuse thyroid uptake in all patients, which was suggestive of Graves' disease. All patients were initially treated with antithyroid drugs and 10 (83%) eventually were treated with radioactive iodine which resulted in hypothyroidism requiring levothyroxine therapy in all patients.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

The association of Down syndrome with thyroid disorders has been recognized for decades and up to 54% of individuals with Down syndrome are reported to have thyroid disorders, mainly hypothyroidism. The recommendation is to regularly screen individuals with Down syndrome for hypothyroidism. A total of 46 cases of hyperthyroidism have been previously reported in Down syndrome but details of the therapy were unclear in most of these cases.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

There is an increased incidence of hyperthyroidism, specifically Graves' disease, in Down syndrome. Most patients have typical symptoms of hyperthyroidism. Physicians taking care of these patients need to be aware of this association and consider a low threshold for obtaining thyroid function tests.

— Alan Farwell, MD

### ATA THYROID BROCHURE LINKS

Hyperthyroidism: [http://thyroid.org/patients/patient\\_brochures/hyperthyroidism.html](http://thyroid.org/patients/patient_brochures/hyperthyroidism.html)

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## **HYPERTHYROIDISM**, continued

### **ABBREVIATIONS & DEFINITIONS**

**Down syndrome:** the most common genetic form of mental retardation and the leading cause of certain birth defects and medical conditions.

**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.

**Methimazole:** an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.



## HYPERTHYROIDISM

### The Onset Of Vasculitis With Antithyroid Drugs Is Both Rare And Unpredictable, But Is More Common With PTU

#### WHAT IS THE STUDY ABOUT?

Vasculitis is a generalized disorder of the immune system where antibodies attack blood vessels and cause inflammation. There are many causes of vasculitis and the problems it can cause range from simple lab abnormalities without symptoms to severe reactions that may cause death. Drugs are a major cause of vasculitis, often by causing the development of specific antibodies known as myeloperoxidase antineutrophil cytoplasmic antibody (MPO-ANCA) which then attack blood vessels. The development of MPO-ANCA has been reported by both Methimazole (MMI) and Propylthiouracil (PTU), the two antithyroid drugs that are used in treating patients with hyperthyroidism. The aim of this study was to determine what doses of the drug are involved and what symptoms are the most common in patients with MPO-ANCA-associated vasculitis caused by PTU or MMI.

#### THE FULL ARTICLE TITLE:

Noh JY, Yasuda S, Sato S, Matsumoto M, Kunii Y, Noguchi Y, Mukasa K, Ito K, Ito K, Sugiyama O, Kobayashi H, Nihojima S, Okazaki M, Yokoyama S. Clinical characteristics of myeloperoxidase antineutrophil cytoplasmic antibody-associated vasculitis caused by antithyroid drugs. *J Clin Endocrinol Metab* 2009;94:2806-11.

#### WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine what doses of the drug are involved and what symptoms are the most common in patients with MPO-ANCA-associated vasculitis caused by PTU or MMI.

#### WHO WAS STUDIED?

The study included 92 patients with Graves' disease who had MPO-ANCA-associated vasculitis as an adverse reaction to antithyroid drugs and thus were reported, as required by law in Japan, to Chugai Pharmaceutical, which makes PTU and MMI.

#### HOW WAS THE STUDY DONE?

The adverse drug reports were reviewed on the 92 patients reported to the drug company.

#### WHAT WERE THE RESULTS OF THE STUDY?

Of the 92 patients with MPO-ANCA-associated vasculitis, 23 (25%) were taking MMI and 68 were taking PTU (75%); in 1 patient it was not clear which of the two had been taken. There was ~3.5-fold more women than men that developed this complication. Symptoms were severe in 79 patients (86%), moderate in 2 (2%), and mild in 2 (2%). MPO-ANCA-associated vasculitis resolved in 62 patients (67%) and caused death in 2 (2%). The most common systems involved were 1) the kidneys with blood in the urine (38%), 2) the lungs with coughing up blood (19%), 3) the skin with ulcers and bruising (13.8%) and 4) the joints with swelling and pain (13.1%). MPO-ANCA-associated vasculitis affected one system in 41 patients (45%), two systems in 32 patients (35%) and three or four systems in the rest. MPO-ANCA-associated vasculitis occurred with almost any dose of drug, with 50% of patients being on MMI 15 mg/day or less or PTU 200 mg/d or less. Vasculitis occurred after being on the drug anywhere from 1 month to >10 years.

#### HOW DOES THIS COMPARE WITH OTHER STUDIES?

MPO-ANCA-associated vasculitis due to PTU has been recognized for some time. Several studies have shown that the vasculitis could spontaneously resolve after cessation of antithyroid drugs and that the long-term outcomes were relatively good. The present study is the largest study of this complication.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Antithyroid drug-induced MPO-ANCA-associated vasculitis is both rare and unpredictable. It occurs more frequently with PTU, but is not correlated with the dose of antithyroid drugs or the duration of therapy. While rare, this complication should be considered in any patient on PTU or MMI who develops blood in the urine, coughs up blood, developed ulcers and bruising or joint pain and swelling.

— Alan Farwell, MD

#### ATA THYROID BROCHURE LINKS

Hyperthyroidism: [http://thyroid.org/patients/patient\\_brochures/hyperthyroidism.html](http://thyroid.org/patients/patient_brochures/hyperthyroidism.html)

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## **HYPERTHYROIDISM**, continued

### **ABBREVIATIONS & DEFINITIONS**

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

**Graves' disease:** the most common cause of hyperthyroidism in the United States.

**Methimazole (MMI):** an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.

**Propylthiouracil (PTU):** an antithyroid medication that blocks the thyroid from making thyroid hormone. Propylthiouracil is used to treat hyperthyroidism, especially in women during pregnancy.

**Vasculitis:** a generalized disorder of the immune system where antibodies attack blood vessels and cause inflammation.

**Myeloperoxidase antineutrophil cytoplasmic antibody (MPO-ANCA):** specific antibodies that may be induced by drugs which then attack blood vessels.



## THYROID CANCER

### <sup>131</sup>I Therapy Surprisingly Is Kept In The Body Longer In Patients Treated With Furosemide And Potassium Chloride Than In A Control Group

#### WHAT IS THE STUDY ABOUT?

In most patients with thyroid cancer, surgery is performed to remove the cancer and the entire thyroid tissue. After surgery, most thyroid cancer patients are treated with radioactive iodine (I-131, RAI) to destroy any remaining thyroid cells, both normal and cancerous. I-131 works because it is taken up by the normal and cancerous thyroid cells and, once inside, the radiation produced by the I-131 destroys the cell. I-131 is very effective because thyroid cells are the only cells in the body that actively take up and concentrate iodine. Some cells, such as those that make of the salivary glands, also can take up iodine but, because it is not concentrated within the cell, the I-131 radiation usually does not severely damage the cell. Only a small fraction of the total dose used to treat a patient is actually taken up by the thyroid cells, with the rest removed from the body, mainly through the urine. However, because the I-131 circulates in the blood before it is removed from the body, the whole body is exposed to the I-131 radiation to some degree. The aim of the I-131 therapy is to achieve the highest radiation dose in thyroid tissue to destroy both remaining normal and cancerous thyroid cells with the lowest possible radiation exposure to the rest of the body. In order for the RAI to be effective, the patient's TSH levels need to be increased to stimulate both the normal and cancerous thyroid cells to take up the I-131 and be destroyed. When the TSH levels are increased by withdrawing patients from thyroid hormone and making them hypothyroid, patients tend to hold onto fluid and the flow of urine through the kidneys is decreased. In an attempt to reduce the whole body radiation in these patients, some physicians use water pills (diuretics) to increase the flow of urine from the kidneys and, hopefully, hasten the removal of I-131 from the body. This study was done to determine if diuretics are useful in reducing the whole body radiation produced by I-131 in patients with thyroid cancer.

#### THE FULL ARTICLE TITLE

Matovic MD, Jankovic SM, Jeremic M, Tasic Z, Vlajkovic M. Whole- body radioiodine retention 72 hours after I-131 therapy is paradoxically higher in patients treated with furosemide and potassium chloride than in control group. *Thyroid* 2009;19:843-8.

#### WHAT WAS THE AIM OF THE STUDY?

The aim of this study is to determine the usefulness of diuretics in reducing the whole body radiation in patients with thyroid cancer receiving I-131 therapy.

#### WHO WAS STUDIED?

A total of 43 patients with thyroid cancer treated with I-131 in the Department of Nuclear Medicine at the Clinical Center in Kragujevac, Serbia, from September 2007 through September 2008. All patients were withdrawn from thyroid hormone before receiving the I-131 therapy.

#### HOW WAS THE STUDY DONE?

The patients were divided in 2 groups:

**Furosemide** — the 23 patients in this group received 20 mg of the diuretic furosemide 3 hours after the administration of the I-131. In addition to increasing the removal of fluid from the body, potassium is also lost after furosemide therapy. To replace the potassium lost, all patients in this group received 250 mg of potassium chloride every 8 hours for the next 3 days.

**Control** — the 20 patients in this group received neither furosemide nor potassium chloride.

The radiation exposure to the patients was measured three ways:

- 1) All patients collected their urine after I-131 treatment to measure the excretion of I-131,
- 2) Whole body radiation measurements were performed immediately after the I-131 treatment and 72 hours later.
- 3) Blood samples were collected 72 hours after the I-131 treatment to measure the radiation exposure to the blood.

#### WHAT WERE THE RESULTS OF THE STUDY?

Surprisingly, the amount of I-131 retained in the body after the I-131 treatment was 1.6 times higher in the furosemide group as compared to controls without furosemide. Patients taking furosemide also had significantly lower removal of I-131 in the urine over 72 hours and the blood radioactivity was almost 3 times higher as compared to controls.

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## THYROID CANCER, continued

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several studies have looked at the use of diuretics to increase the radioactivity excretion after I-131 treatment. A few studies showed that diuretics did increase the elimination of I-131 in the urine. However, the present study found the opposite, with decreased elimination of I-131 in the urine and higher whole body radiation. Interestingly, in all these studies, THW was used to prepare patients for I-131 therapy, which may cause decreased elimination of I-131 in the urine due to hypothyroidism.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In patients with thyroid cancer receiving I-131 after THW, diuretics surprisingly increased the whole body

radiation rather than decreasing it, which was expected. Because of this, it is not recommended to use these medications after I-131 therapy. The decreased elimination of I-131 in the urine due to hypothyroidism could possibly be avoided by increasing the patients TSH level with rhTSH before I-131 instead.

— Jamshid Farahati, MD

### ATA THYROID BROCHURE LINKS

Thyroid cancer: [http://thyroid.org/patients/patient\\_brochures/cancer\\_of\\_thyroid.html](http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html)

Radioactive Iodine Therapy: [http://thyroid.org/patients/patient\\_brochures/radioactive.html](http://thyroid.org/patients/patient_brochures/radioactive.html)

### ABBREVIATIONS AND DEFINITIONS

**Radioactive iodine (RAI):** this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

**Furosemide:** is a water pill (diuretic). Diuretics decrease the body fluid by allowing the kidneys to get rid of unneeded water and salt from the body into the urine.

**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.

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

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



## THYROID CANCER

# In Patients With Thyroid Microcarcinoma, Spread Of The Cancer To The Lymph Nodes Or Outside Of The Neck At The Time Of Diagnosis Is Associated With An Unfavorable Outcome

### WHAT IS THE STUDY ABOUT?

There has been a rapid increase in the number of new cases of thyroid cancer over the last 30 years. Almost all of the increase has been in papillary thyroid cancer. While there has been an increase of papillary cancer of all sizes, of particular interest has been in the increase in the so-called papillary microcarcinomas – those <1 cm in size. Some studies suggest that these microcarcinomas are much less likely to spread than larger cancers while some suggest that size does not make any difference in cancer spread. Because of this, there has been a wide range of opinions as to how patients with papillary microcarcinomas should be treated. This study looks at outcomes of patients with papillary microcancers as compared to those with those papillary cancers >1 cm (macrocarcinomas) in size.

### THE FULL ARTICLE TITLE:

Tzvetov G, Hirsch D, Shraga-Slutsky I, Weinstein R, Manistersky Y, Kalmanovich R, Lapidot M, Grozinsky-Glasberg S, Singer J, Sulkes J, Shimon I, Benbassat C. Well-differentiated thyroid carcinoma: comparison of microscopic and macroscopic disease. *Thyroid* 2009;19:487-94.

### WHAT WAS THE AIM OF THE STUDY?

The aim of this study is to look at outcomes of patients with papillary microcancers as compared to those with those papillary cancers >1 cm (macrocarcinomas) in size.

### WHO WAS STUDIED?

This study looked at a total of 768 patients treated for thyroid cancer in the Rabin Medical Center in Israel from 1973 through 2005. Of the 768 patients, 543 had cancers > 1 cm (71%) and 225 had cancers ≤1 cm (29%).

### HOW WAS THE STUDY DONE?

The patient's records were reviewed as to patient age, sex, cancer type, primary therapy and the extent of cancer, local recurrence of the cancer, and distant metastases. Persistent or recurrent cancer was defined as detectable cancer 1 year after initial therapy. Patients were considered

cancer-free if they had no evidence of the cancer by blood tests and ultrasonography at their last visit.

### WHAT WERE THE RESULTS OF THE STUDY?

At the time of initial treatment, there was no difference between the microcarcinomas and the macrocarcinomas in terms of spread to the lymph nodes (26% vs 30%) or spread outside of the neck (2% vs 5%). In the follow up period, cancer recurrence was found more frequently in patients with macrocarcinomas (32% vs 11%), as was spread outside of the neck (10% vs 5%). At the end of follow-up, 216 patients (96%) in the microscopic and 543 (77%) in the macroscopic cancer group were cancer-free. In patients with microcarcinomas, spread of the cancer to the lymph nodes or outside of the neck at the time of diagnosis was associated with an unfavorable outcome.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

In other studies, the recurrence rate for papillary microcarcinomas ranges from 5-17%, so the 11% recurrence falls about in the middle. Spread to lymph nodes in the neck and extension of the cancer outside of the neck has also been shown to be associated with unfavorable outcomes in other studies.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Patients with papillary microcarcinoma are more likely to have a favorable outcome than patients with larger cancers. However, the factors associated with unfavorable outcomes (spread of the cancer to the lymph nodes or outside of the neck at the time of diagnosis) are similar in both the papillary microcarcinomas and macrocarcinomas.

— Alan Farwell, MD

### ATA THYROID BROCHURE LINKS

Thyroid cancer: [http://thyroid.org/patients/patient\\_brochures/cancer\\_of\\_thyroid.html](http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html)

*continued on next page*



## **THYROID CANCER,** continued

### **ABBREVIATIONS & DEFINITIONS**

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

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

**Lymph node** — bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

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



AMERICAN  
THYROID  
ASSOCIATION  
FOUNDED 1923



*Friends of the ATA*  
Founded 2005

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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.



## 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](http://www.thyroid.org)

ATA Patient Resources: <http://www.thyroid.org/patients/>

Find a Thyroid Specialist: [www.thyroid.org](http://www.thyroid.org)

Phone (toll-free): 1-800-THYROID

e-mail: [thyroid@thyroid.org](mailto: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](http://www.ngdf.org)

Phone (toll-free): 1-877-NGDF-123 or 643-3123

e-mail: [Gravesdiseasefd@gmail.com](mailto: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](http://www.checkyourneck.com)

email: [info@checkyourneck.com](mailto: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](http://www.thyca.org)

Phone (toll-free): 877 588-7904

e-mail: [thyca@thyca.org](mailto: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

DATE	EVENT	PLACE	ORGANIZATION
Spring 2010	<b>Light of Life Educational Symposium</b> <a href="http://www.checkyourneck.com">www.checkyourneck.com</a>	New York City	Light of Life