Clinical THYROIDOLOGY FOR PATIENTS

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Carswell JM et al. Generic and brand-name L-thyroxine are not bioequivalent for children with severe congenital hypothyroidism. J Clin Endocrinol Metab. December 21, 2012.

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Hoermann R et al. Is pituitary thyrotropin an adequate measure of thyroid hormone-controlled homeostasis during thyroxine treatment? Eur J Endocrinol. November 26, 2012 [Epub ahead of print].

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Maternal thyroid function during pregnancy may influence infant birth weight

Thyroid hormone is important for normal for growth and development of the baby during pregnancy. This study was done to better understand the relationships between women's thyroid hormone levels during pregnancy and their babies' size and weight at birth.

Medici M et al. Maternal thyroid hormone parameters during early pregnancy and birth weight: the Generation R Study. J Clin Endocrinol Metab 2013;98:59-66. Epub November 12, 2012; doi: 10.1210/jc.2012-2420.

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Subacute thyroiditis is usually due to a viral infection of the thyroid which often leads to neck pain. For severe pain and other symptoms, a course of high dose corticosteroids can be effective but may have undesirable side effects. The current study is an evaluation of the efficacy of a low dose corticosteroids given for 2 weeks followed by a slow taper as tolerated.

Kubota S et al. Initial treatment with 15 mg of prednisolone daily is sufficient for most patients with subacute thyroiditis in Japan. Thyroid. December 10, 2012 [Epub ahead of print]

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A survey of management of uncomplicated Graves' disease shows a change in treatment practices

Graves' disease is the most common cause of hyperthyroidism in the United States. Treatment options include antithyroid drugs, radioactive iodine or surgery. In 2011, the authors performed a survey of the management of Graves' disease by members of various endocrine societies here and abroad. The results were compared with those of a similar survey published in 1990.

Burch HB et al. A 2011 survey of clinical practice patterns in the management of Graves' disease. J Clin Endocrinol Metab 2012;97:4549-58. Epub October 5, 2012; doi: 10.1210/jc.2012-2802.

THYROID CANCER 12

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Thyroid cancer is common and appears to be increasing in incidence. There has been controversy in the literature as to whether thyroid glands with single thyroid nodules carry the same risk of cancer as nodules found in multinodular goiters. The authors of this study analyzed results from many different studies to determine whether nodules in multinodular goiters are more or less likely cancerous than single thyroid nodules.

Brito JP et al. Prevalence of thyroid cancer in multinodular goiter vs. single nodule: a systematic review and meta-analysis. Thyroid. October 15, 2012 [Epub ahead of print].

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EDITOR'S COMMENTS

Welcome to Clinical Thyroidology for Patients, bringing to you, the patient, the most up-to-date, cutting edge thyroid research. What you read here as research studies will likely become the accepted practice in the future. *Clinical Thyroidology for Patients* is published on a monthly basis and includes summaries of research studies that were discussed in a recent 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.

We will be providing even faster updates of late-breaking thyroid news through Twitter at @thyroidfriends and on Facebook. Our goal is to provide you with the tools to be the most informed thyroid patient in the waiting room. Also check out our friends in the ATA Alliance for Thyroid Patient Education. The Alliance member groups consist of: the American Thyroid Association, the Graves' Disease and Thyroid Foundation, the Light of Life Foundation, ThyCa: Thyroid Cancer Survivors Association, Thyroid Cancer Canada and Thyroid Federation International.

LEVOXYL Alert — there is a nationwide shortage in LEVOXYL that may not be resolved until 2014. Please see details here.

In this issue, the studies ask the following questions:

- Are generic and branded levothyroxine preparations equal?
- Is TSH the best measure for levothyroxine treatment in hypothyroid patients?
- Can the mother's thyroid function affect her baby's birth weight?
- Should subacute thyroiditis be treated with corticosteroids?
- Is the treatment of Graves' disease changing?
- How common in cancer in nodular goiters?

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

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LEVOXYL Alert

In mid-March, we were made aware of a nationwide shortage of LEVOXYL, a branded levothyroxine product. The parent company, Pfizer, released a letter containing the following notice:

"We are writing to inform you that LEVOXYL (levothyroxine sodium), a prescription medicine approved to treat hypothyroidism and for the treatment or prevention of certain types of goiter, is currently on backorder. Pfizer stopped shipping all strengths of the product on February 13, 2013. Pfizer is discussing the backorder situation with the FDA and will resume shipment once the issue is resolved."*
http://www.thyroid.org/wp-content/uploads/news/2013/LEVOXYL.pdf

Subsequently, Pfizer released a letter on April 1 that LEVOXYL is being recalled and that it may not be available again until 2014.

" King Pharmaceuticals LLC, a wholly owned subsidiary of Pfizer Inc, has initiated a recall of LEVOXYL (levothyroxine sodium) at retail pharmacies. LEVOXYL is a prescription medicine approved to treat hypothyroidism and prevent certain types of goiter.

The voluntary LEVOXYL recall is due to complaints from pharmacists and patients of an uncharacteristic odor after some LEVOXYL bottles have been opened. The odor is related to the oxygen-absorbing canister that is packaged in the 100-count and 1000-count bottles. Pfizer has conducted a careful health assessment and has concluded that the odor is not likely to cause any adverse health consequences. However, the company discussed this situation with the FDA and decided, out of an abundance of caution, to voluntarily recall all strengths of LEVOXYL to the retail level. There is no need for patients to return or discard the medication they have, as they may continue to take the medication in accordance with their health care provider's prescribed directions."*
http://www.thyroid.org/wp-content/uploads/news/2013/Levoxyl_Recall_Letter3.28.13.pdf

We will keep you informed as we receive further updates. In the absence of LEVOXYL, other levothyroxine preparations include the branded preparations SYNTHROID® (AbbVie) and TIROSINT® (Akrimax) (and others) and the generic preparations. The ATA recommends that you have your thyroid levels check 6-8 weeks after a change to another levothyroxine preparation.

— Alan P. Farwell, MD
Editor

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HYPOTHYROIDISM

Generic and branded levothyroxine preparations are not the same in children with congenital hypothyroidism

BACKGROUND

Hypothyroidism is treated by thyroid hormone replacement therapy, usually in the form of levothyoxine. There are branded levothyroxine preparations (ie Synthroid™, Levoxyl™) as well as generic preparations. While the FDA has deemed generic and branded preparations equal, this has been based on short-term studies in healthy adult volunteers and not long-term treatment of hypothyroid patients. In infants with severe congenital hypothyroidism, even small changes in thyroid hormone levels may have negative effects on their development. Few clinical studies have been performed to date to determine whether generic and branded levothyroxine preparations are truly equal in patients with hypothyroidism. In this study, generic and branded levothyroxine preparations are compared as treatment in a group of hypothyroid children.

THE FULL ARTICLE TITLE

Carswell JM et al. Generic and brand-name L-thyroxine are not bioequivalent for children with severe congenital hypothyroidism. J Clin Endocrinol Metab. December 21, 2012.

SUMMARY OF THE STUDY

This study evaluated 31 children and adolescents 3 to 18 years of age with known hypothyroidism (serum TSH concentration at diagnosis, >100 mIU/L). A total of 20 of the children had congenital hypothyroidism, while the rest had Hashimoto's thyroiditis as the cause of their hypothyroidism. The children were assigned to receive their usual levothyroxine dose as either Synthroid™ (Abbott Laboratories) or generic levothyroxine (Sandoz) for 8 weeks and then were switched to the other preparation for 8 weeks. Serum TSH, free T_4, and total T_3 were measured at the end of each 8 week treatment period were compared for each subject.

The serum TSH was significantly lower (0.7 mIU/L vs. 1.8 mIU/L) after 8 weeks of Synthroid™ than after 8 weeks of the generic levothyroxine. This difference did not depend on age and was seen only in children with congenital hypothyroidism. In the children with Hashimoto's disease, TSH did not differ between branded and generic levothyroxine. There were no differences in free T_4 or total T_3 following each treatment period.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study demonstrates that Synthroid and generic levothyroxine are not equal in children with congenital hypothyroidism, even though the FDA states they are interchangeable. This difference was not observed in patients with Hashimoto's thyroiditis, possibly because they have an intact thyroid although it is not working. The results in the children with congenital hypothyroidism may possibly be seen in other patients (such as those with thyroid cancer) who have had a thyroidectomy. In any event, this study reinforces the need for checking thyroid tests to adjust the dose when the levothyroxine preparations are being changed. Further studies with larger number of patients would be helpful to confirm these results.

— M. Regina Castro, MD

ATA THYROID BROCHURE LINKS

Hypothyroidism: http://www.thyroid.org/what-is-hypothyroidism

Thyroid Function Tests: http://www.thyroid.org/blood-test-for-thyroid

Thyroid Hormone Treatment: http://www.thyroid.org/thyroid-hormone-treatment

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HYPOTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

Hashimotos thyroiditis: the most common cause of hypothyroidism in the United States. It is caused by antibodies that attack the thyroid and destroy it.

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

Congenital hypothyroidism: thyroid hormone deficiency (hypothyroidism) present at birth.

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.

Levothyroxine (T_4): the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levothroid™ and generic preparations.

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

Thyroxine (T_4): 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 (T_3): the active thyroid hormone, usually produced from thyroxine.

TSH: thyroid stimulating hormone – produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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THYROID FUNCTION TESTS

Is serum TSH the best measure for levothyroxine treatment in hypothyroid patients?

BACKGROUND

Thyroid stimulating hormone (TSH) is a hormone produced by the pituitary gland and released into the circulation. TSH binds to thyroid cells to stimulate the production and secretion of the thyroid hormones T_4 and T3. When thyroid hormone levels are low, TSH secretion is increased and stimulates the thyroid to produce and secrete more T_4 and T_3. When thyroid hormone levels are high, TSH secretion is decreased and T_4 and T_3 fall. In patients with hypothyroidism, TSH is thought to be the most sensitive test to guide thyroid hormone treatment. Recent studies have questioned whether monitoring thyroid hormone treatment with TSH alone is adequate. The aim of this study was to compare serum T_4 and T_3 levels in hypothyroid patients treated with thyroid hormone to those in untreated patients.

THE FULL ARTICLE TITLE

Hoermann R et al. Is pituitary thyrotropin an adequate measure of thyroid hormone-controlled homeostasis during thyroxine treatment? Eur J Endocrinol. November 26, 2012 [Epub ahead of print].

SUMMARY OF THE STUDY

The study included 1994 patients seen in a thyroid clinic between October 2006 and January 2007. The majority of patients were women and the average age was 61 years. There were 785 hypothyroid patients who were taking between 50 to 200 µg of levothyroxine daily. These patients were compared with 1159 patients who were not treated with thyroid hormone. The cause of hypothyroidism was thyroid surgery or radioactive iodine treatment in most patients as only 1/3 of these patients had Hashimoto's thyroiditis. Serum T_3 levels were lower in hypothyroid patients taking levothyroxine as compared to those of untreated patients at that same TSH level. Serum T_4 levels were lower in control subjects than in levothyroxine-treated subjects for a similar TSH level. Based on a complex mathematical program, the authors postulated that in hypothyroid patients treated with levothyroxine there is increased conversion of T_4 to T_3 within the pituitary but decreased conversion of T_4 to T_3 in the rest of the body. Therefore, some hypothyroid patients treated with levothyroxine who have TSH within normal range will have T_3 levels below the normal range of healthy individuals. The authors concluded that in hypothyroid patients undergoing levothyroxine treatment, TSH cannot be considered to be the gold standard of adequate replacement.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors suggest that TSH is not the best measure of thyroid hormone replacement in hypothyroid patients. A major limitation to the study is that their analysis is based on mathematical models as opposed to actual data. Certainly there are patients who have low T_3 levels despite normal T_4 and TSH levels. In these patients, adding a T_3 preparation to levothyroxine therapy may be indicated, especially if they continue to have hypothyroid symptoms on their own. However, it appears that levothyroxine therapy alone is sufficient for most hypothyroid patients.

— Alina Gavrila, MD, MMSC

ATA THYROID BROCHURE LINKS

Hypothyroidism: http://www.thyroid.org/what-is-hypothyroidism

Thyroid Hormone Treatment: http://www.thyroid.org/thyroid-hormone-treatment

Thyroid Function Tests: http://www.thyroid.org/blood-test-for-thyroid

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THYROID FUNCTION TESTS, continued

ABBREVIATIONS & DEFINITIONS

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.

Pituitary gland: this endocrine gland sits at the base of the brain and secretes hormones that control thyroid and adrenal function, growth and reproduction. The pituitary gland secretes TSH to control thyroid function.

Thyroxine (T_4): the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levothroid™ and generic preparations. T_4 gets converted to the active hormone T_3 in various tissues in the body.

Triiodothyronine (T_3): the active thyroid hormone, usually produced from thyroxine, available in pill form as Cytomel™.

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. Replacement therapy means the goal is a TSH in the normal range and is the usual therapy.

Hashimoto's thyroiditis: of hypothyroidism in the United States. This represents an autoimmune disease and it is caused by antibodies that attack and destroy the thyroid.

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 an overactive thyroid.

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THYROID AND PREGNANCY

Maternal thyroid function during pregnancy may influence infant birth weight

BACKGROUND

Thyroid hormone is important for normal for growth and development of the baby during pregnancy. The mother provides all the thyroid hormone for the baby during the 1st trimester. Even small changes in thyroid hormone levels in the mother within the normal range may affect the growth of the baby. While the essential role of thyroid hormone in brain development is clear, the effects of changes in thyroid hormone on growth are less clear. This study was done to better understand the relationships between women's thyroid hormone levels during pregnancy and their babies' size and weight at birth.

THE FULL ARTICLE TITLE

Medici M et al. Maternal thyroid hormone parameters during early pregnancy and birth weight: the Generation R Study. J Clin Endocrinol Metab 2013;98:59-66. Epub November 12, 2012; doi: 10.1210/jc.2012-2420.

SUMMARY OF THE STUDY

This was a study of over 4,400 pregnant women and their infants in Rotterdam, Netherlands from 2002-2006. Using medical records, the researchers studied thyroid function tests (which had been done in all the mothers and in over 2,700 of the infants) as well as the birth weights of the infants. Mothers who had free T_4 levels at the high end of the normal range were more likely to have smaller babies with a lower birth weight.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The main finding of the study, that pregnant women with higher thyroid hormone levels had smaller babies, is surprising. The results may be influenced by many factors, including changes in thyroid hormone levels during pregnancy in women with normal thyroid glands. More research is needed to better understand this. For now, the study does not provide strong enough evidence to suggest that pregnant women with thyroid dysfunction should managed differently than current standards.

— Angela M. Leung, MD, MSc

ATA THYROID BROCHURE LINKS

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

Thyroid Function Tests: http://www.thyroid.org/blood-test-for-thyroid

Thyroid and Weight: http://www.thyroid.org/weight-loss-and-thyroid

ABBREVIATIONS & DEFINITIONS

Thyroxine (T_4): 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.

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THYROIDITIS

Treatment of subacute (viral) thyroiditis with low dose corticosteroids

BACKGROUND

Subacute thyroiditis is usually due to a viral infection of the thyroid which often leads to neck and ear pain, fever, muscle aches and tenderness over a swollen thyroid. It may result in initial hyperthyroidism as the thyroid gland releases its stored hormone, followed by hypothyroidism and then a return to normal. This process may take many months to evolve. The pain occurs in the beginning of the illness and can be severe. The usual treatment for the pain is to use nonsteroidal anti-inflammatory drugs such as ibuprofen. For severe pain, a course of corticosteroids can be effective, starting with a high dose of 40 mg of prednisone and then a slow taper of the drug. The response to prednisone is usually quite rapid, but the thyroiditis may recur while the drug is tapered and high doses of corticosteroids, like prednisone, may have undesirable side effects. The current study is an evaluation of the efficacy of a low dose (15 mg per day) of a different corticosteroid, prednisolone, given for 2 weeks followed by a reduction by 5 mg every 2 weeks as tolerated.

THE FULL ARTICLE TITLE

Kubota S et al. Initial treatment with 15 mg of prednisolone daily is sufficient for most patients with subacute thyroiditis in Japan. Thyroid. December 10, 2012 [Epub ahead of print].

SUMMARY OF THE STUDY

Over almost a 4 year period the authors diagnosed 384 patients with subacute thyroiditis, of which 219 patients were treated with low dose prednisolone. About 80% of the patients had elevated free thyroxine levels at the beginning of the study. Thyroiditis improved in 6 weeks in 113 patients (51.6%), while 106 patients took prednisolone for 7 weeks or longer, including 27 who took it for more than 12 weeks. About 20% of the patients took more than 8 weeks to recover. Of interest, the higher the free thyroxine and triiodothyroine levels, the shorter the period of time that the therapy had to be given. Transient hypothyroidism occurred in 31% of patients and permanent hypothyroidism in 3.6%.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that subacute thyroiditis could be treated effectively with a low dose of prednisolone for 2 weeks followed by a tapering dose. This is an important study as it shows that patients with painful, subacute thyroiditis could be effectively treated with a dose of corticosteroid that is about half of the dose that previously has been recommended, with similar results of 80% remission and 20% relapse rate.

— Glenn Braunstein, MD

ATA THYROID BROCHURE LINKS

Thyroiditis: http://www.thyroid.org/what-is-thyroiditis

ABBREVIATIONS & DEFINITIONS

Steroids/Glucocorticoids: general antiinflammatory and immunosuppressive drugs that are commonly used for the treatment of many autoimmune diseases associated with inflammation. Prednisone is one of the most commonly used corticosteroid.

Thyroxine (T_4): 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 (T_3): the active thyroid hormone, usually produced from thyroxine.

TSH: thyroid stimulating hormone – produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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GRAVES' DISEASE

A survey of management of uncomplicated Graves' disease shows a change in treatment practices

BACKGROUND

Graves' disease is the most common cause of hyperthyroidism in the United States. It is caused by an antibody (thyroid stimulating immunoglobulin, TSI) that attacks and turns on the thyroid, causing it to be overactive. Antithyroid drugs such as methimazole are used to return thyroid function to normal. Long-term (1-2 years) treatment with methimazole can occasionally cause the TSI to go away and the Graves' disease go into remission. Alternatively, the thyroid can be destroyed by treatment with either radioactive iodine or surgery. In the United States, radioactive iodine is the most common treatment for Graves' disease. In 2011, the authors performed a survey of the management of Graves' disease by members of various endocrine societies here and abroad. The results were compared with those of a similar survey published in 1990.

THE FULL ARTICLE TITLE

Burch HB et al. A 2011 survey of clinical practice patterns in the management of Graves' disease. J Clin Endocrinol Metab 2012;97:4549-58. Epub October 5, 2012; doi: 10.1210/jc.2012-2802.

SUMMARY OF THE STUDY

A survey that contained several clinical cases, including a 42 year old woman and a 22 year old woman who was thinking about getting pregnant in the next year. These was the same clinical cases that were included in the 1990 survey. The survey was web-based and the target groups were members of the American Thyroid Association (ATA), The Endocrine Society (TES) and the American Association of Clinical Endocrinologists (AACE). There were 730 respondents, including 162 members of ATA, 648 of TES and 333 of AACE, many having dual membership in the societies.

For primary therapy, 54% preferred antithyroid drugs, 45% preferred radioactive iodine and only 1% preferred thyroidectomy. In North America, 59% would choose radioactive iodine as compared with 69% in 1990. With regard to the choice of antithyroid drugs, 83.5% would use methimazole whereas in 1990 73% selected PTU. With regard to the duration of antithyroid drug therapy, 19.3% would treat for 24 months, 35.4% for 18 months, 30.2% for 12 months and 13.9% for less than 1 year. With regard to pretreatment of patients with antithyroid drugs before radioactive iodine, 49% used this only in selected patients, 13% never did this and 38% did this routinely.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

During the past two decades there has been a shift away from radioactive iodine and toward antithyroid drugs for treatment of patients with uncomplicated Graves' disease. This is especially true for physicians in North America. There also has been a shift from PTU to methimazole in choice of antithyroid drug. This is consistent with recently released guidelines for management of hyperthyroidism published by ATA and AACE.

— Alan Farwell, MD

ATA THYROID BROCHURE LINKS

Hyperthyroidism: http://www.thyroid.org/what-is-hyperthyroidism

Graves' disease: http://www.thyroid.org/what-is-graves-disease

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GRAVES' DISEASE, continued

ABBREVIATIONS & DEFINITIONS

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

Graves' disease: the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

Antithyroid drugs: medications that block the thyroid from making thyroid hormone. They are is used to treat hyperthyroidism, especially when it is caused by Graves' disease. The main antithyroid drugs in the United States are Methimazole and Propylthiouracil.

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. It is usually given once a day.

Propylthiouracil (PTU): an antithyroid medication that blocks the thyroid from making thyroid hormone. PTU is used to treat hyperthyroidism, especially when it is caused by Graves' disease. It is usually given more than once a day.

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).

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THYROID CANCER

Prevalence of thyroid cancer in nodular goiter

BACKGROUND

Thyroid cancer is common and appears to be increasing in incidence. The diagnosis of thyroid cancer results from the evaluation of thyroid nodules. There has been controversy in the literature as to whether thyroid glands with single thyroid nodules carry the same risk of cancer as nodules found in multinodular goiters. Initially, research suggested that nodules in multinodular goiters carried a lower risk of thyroid cancer than single nodules, then later studies demonstrated they carried the same risk of cancer. The authors of this study analyzed results from many different studies to answer the question of whether nodules in multinodular goiters are more or less likely cancerous than single thyroid nodules.

THE FULL ARTICLE TITLE:

Brito JP et al. Prevalence of thyroid cancer in multinodular goiter vs. single nodule: a systematic review and meta-analysis. Thyroid. October 15, 2012 [Epub ahead of print].

SUMMARY OF THE STUDY

The authors reviewed the literature for studies of thyroid cancer in thyroid glands with single thyroid nodules and multinodular goiters. A total of 14 studies were identified for use in the analysis and included 23,565 patients in the multinodular goiter group and 20,723 patients with thyroid glands with single nodules. These authors pooled results from all these studies and found that multinodular goiters were associated with ~20% lower risk of thyroid cancer than single nodules. Interestingly, this lowered risk was only seen in studies form Europe, as there was no difference in studies conducted in the United States.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors conclude thyroid cancer may be less frequent in multinodular goiters compared to thyroid glands with single nodules, especially outside the United States. At this time, these results do not change the general recommendations that nodules greater than 1-1.5 cm in size be considered for fine needle aspiration biopsy to evaluate for thyroid cancer, regardless if they were a solitary nodule or within a multinodular goiter.

—Whitney Woodmansee, MD

ATA THYROID BROCHURE LINKS

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

Thyroid Nodules: http://www.thyroid.org/what-are-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% are cancerous.

Goiter: a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

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ATA Alliance for Thyroid Patient Education

WELCOME

The American Thyroid Association is pleased to welcome our two newest members, **Thyroid Federation International** and **Thyroid Cancer Canada**, to the 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 towards 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/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 AND THYROID FOUNDATION

www.gdatf.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.

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AMERICAN THYROID ASSOCIATION FOUNDED 1923

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

GRAVES' DISEASE & THYROID FOUNDATION

Thyroid Cancer Canada
Cancer de la thyroïde Canada

Light of Life Foundation
checkyourneck.com

Thyroid Federation International

ATA Alliance for Thyroid Patient Education

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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.

THYROID CANCER CANADA

www.thyroidcancercanada.org
Phone: 416-487-8267
Fax: 416-487-0601
e-mail: info@thyroidcancercanada.org

Thyroid Cancer Canada is a non-profit organization founded in 2000. The organization works towards creating an environment in which people who are dealing with thyroid cancer, especially the newly diagnosed, are met with support and information. Their goals & objectives include facilitating communication among thyroid cancer patients, providing credible information about the disease, providing emotional support, and assisting thyroid cancer patients with voicing their needs to health care professionals and those who are responsible for health care policy.

THYROID FEDERATION INTERNATIONAL

http://www.thyroid-fed.org/
e-mail: tfi@thyroid-fed.org

Thyroid Federation International (TFI) was established in Toronto in 1995. Thyroid Federation International aims to work for the benefit of those affected by thyroid disorders throughout the world by providing a network of patient support organizations.