AMERICAN THYROID ASSOCIATION
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PEDIATRIC GRAVES' DISEASE

Factors Affecting Response to Radioactive Iodine Therapy in Children with Graves' Disease

WHAT IS THE STUDY ABOUT?

Graves' disease is the most common cause of hyperthyroidism in children and adolescents. Graves' disease is an autoimmune condition, meaning that it is caused by antibodies that attack the thyroid and turn it on. Graves' disease may be treated with antithyroid drugs (methimazole or propylthiouracil), radioactive iodine I-131 or surgery. In general, many endocrinologists are less likely to recommend the use of radioactive iodine in children than they are in adults with Graves' disease, possibly due to concerns for an increased risk of thyroid cancer or genetic damage. This study examined the response of Graves' disease in children to radioactive iodine therapy and identified the factors that affected the outcome of such therapy.

THE FULL ARTICLE TITLE:

McCormack et al. Radioactive iodine for hyperthyroidism in children and adolescents: referral rate and response to treatment. Clin Endocrinol (Oxf) 2009.

WHAT WAS THE AIM OF THE STUDY?

To determine the factors that affect the outcome of radioactive iodine therapy in children and adolescents with Graves' disease.

WHO WAS STUDIED?

Out of a group of 720 patients treated in the Pediatric Endocrine Unit or the Thyroid Unit of the Massachusetts General Hospital, a total of 48 patients were found with Graves' disease who received radioactive iodine treatment.
How was the study done?
The patients' charts were reviewed for treatment outcome, as well as a variety of factors that could affect the outcome of treatment.

WHAT WERE THE RESULTS OF THE STUDY?

The indication for radioactive iodine treatment was patient preference in half the group, intolerance to methimazole or propylthiouracil in 29%, poor control of the hyperthyroidism in 19% and indication unknown in 2%. Of the 48 patients treated with radioactive iodine, 35 (73%) were successfully treated while 13 (27%) had a poor response or required a second treatment with radioactive iodine. The factors that predicted a poor response were the use of antithyroid drugs prior to the radioactive iodine, poor control of hyperthyroidism, the presence of Graves' eye disease, and a delay in administering radioactive iodine for more than 12 months after the diagnosis of hyperthyroidism.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

A long-term study of children or adolescents treated with radioactive iodine for Graves' disease have not shown an increased risk of thyroid cancer or genetic damage, and therefore, this therapy is considered to be relatively safe. The major effect of radioactive iodine is hypothyroidism from destruction of the thyroid, which actually is a desired outcome. Studies in adults also have shown that prior treatment of patients with Graves' disease with antithyroid drugs is associated with an increased risk of treatment failure if the antithyroid drugs are given in the week before or the week after the administration of radioactive iodine.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Children and young adults may be safely treated with radioactive iodine for Graves' disease. However, the effectiveness of the therapy is reduced if the patient has received antithyroid drugs prior to the radioactive iodine , or if they have Graves' eye disease or hyperthyroidism that has been present for over a year before they receive the radioactive iodine .

— Glen Braunstein, MD

ATA THYROID BROCHURE LINKS

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

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

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PEDIATRIC 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.

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.

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

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).