



## GRAVES' DISEASE IN CHILDREN

### WHAT IS THE STUDY ABOUT?

Relapse of hyperthyroidism in children with Graves' disease treated with antithyroid drugs

**THE FULL ARTICLE TITLE:** Kaguelidou F, Alberti C, Castanet M, Guittény MA, Czernichow P, Leger J. Predictors of autoimmune hyperthyroidism relapse in children after discontinuation of antithyroid drug treatment. *J Clin Endocrinol Metab* 2008;93:3817  
<http://www.ncbi.nlm.nih.gov/pubmed/18628515?dopt=Citation>

### WHAT WAS THE AIM OF THE STUDY?

This study was done to identify factors that predict relapse of hyperthyroidism in children with Graves' disease treated with antithyroid drugs (ATDs).

### WHO WAS STUDIED?

This is a prospective, multicenter cohort study of 154 children with Graves' disease treated with carbimazole (an antithyroid drug). They were all younger than 19 years of age, and no neonatal thyrotoxic babies were included in the study.

### HOW WAS THE STUDY DONE?

The intent was to treat all patients with one or two daily doses of carbimazole at a starting dose of 0.5 mg/kg per day, but over time this was decreased by 20 to 40% to maintain euthyroidism. The primary outcome was relapse of hyperthyroidism. Patients had clinical evaluations on months 1, 2, 3, 6, 9, 12, 18 and 24 months.

### WHAT WERE THE RESULTS OF THE STUDY?

Older children were less likely to experience a relapse of hyperthyroidism after ATD withdrawal with a decrease in risk of 26% for every 5-year increase in age. Non-Caucasian patients were found to be 2.5-fold more likely to suffer a relapse than Caucasian patients. Also, a 10-point increase in serum FT<sub>4</sub> and a 10-unit increase in the multiple of upper normal limit for serum TRAb levels at diagnosis resulted in an 18 and 21% increase of relapse risk, respectively.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

A number of studies suggest that antithyroid drugs should be used for 12 to 18 months, and longer duration of treatment generally has no advantage. There are few studies of hyperthyroid Graves' disease, but several others also suggest that extending the duration of treatment may be beneficial.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The main implication of the study is that children may require longer periods of treatment with antithyroid drugs, although this study was not structured to determine how much longer children should be treated. Also, there are a number of studies in adults that find no advantage in treating a patient with hyperthyroid Graves' disease longer than 18 months. A European multicenter trial found that the dose of methimazole in Graves' disease can safely be kept to the minimal required dose, which will provide the same chance of remission as higher doses, thus providing the best balance of risk and benefit. The other uncertainty in the management of hyperthyroid children is compliance. The evidence suggests that treatment adherence is generally lower in children than in adults, particularly in adolescents as they approach independence.

### ABBREVIATIONS & DEFINITIONS

**Carbimazole** is a form of antithyroid drug used in Europe, which is closely related to and comparable with methimazole that is used in the United States.

**TSH** Thyroid stimulating hormone (thyrotropin) is a pituitary hormone that stimulates the release of thyroid hormone from the thyroid gland. TSH levels increase when the thyroid gland fails to make sufficient thyroid hormone.

**FT<sub>3</sub>** is triiodothyronine is the most powerful form of thyroid hormone, accounting for most of the immediate activity of this hormone.

**FT<sub>4</sub>** is free levothyroxine, the second main form of thyroid hormone, much of which is transformed to T<sub>3</sub> by enzymes situated in various organs.

**Euthyroid** is normal thyroid function.

**TRAb** is anti-thyrotropin receptor antibodies. This is a key antibody that stimulates thyroid secretion of thyroid hormones in patients with Graves' disease.