CLINICAL THYROIDOLOGY **FOR PATIENTS**

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HYPOTHYROIDISM

Valproic acid therapy causes subclinical hypothyroidism in children with seizure disorders

BACKGROUND

Most cases of hypothyroidism are caused by autoimmune process where antibodies attack the thyroid and destroy the gland. Subclinical (mild) hypothyroidism, where the only abnormality is an increased TSH level, is more common than overt hypothyroidism where the TSH is increased and the thyroid hormones decreased. A variety of drugs can also affect the thyroid. These effects range from altering lab tests for the thyroid hormones without affecting thyroid function to causing frank hypo- or hyperthyroidism. There are several drugs that are used to treat seizures that can affect the lab tests for the thyroid hormones as well as some that can cause hypothyroidism. Valproic acid is a highly effective drug to treat seizures, especially in children. This study was performed to determine if valproic acid has any effect on thyroid function.

THE FULL ARTICLE TITLE

Kim SH et al. Subclinical hypothyroidism during valproic acid therapy in children and adolescents with epilepsy. Neuropediatrics 2012;43:135-9. Epub May 22, 2012; doi: 10.1055/s-0032-1313913.

SUMMARY OF THE STUDY

A total of 61 children who were taking valproic acid for more than 6 months were studied. They were compared to 141 children who were not taking this medication. Both sets of children had their thyroid function tests measured at regular intervals. This included a TSH, Free T_4, total T_3 and TPO antibodies (a marker of thyroid autoimmunity). Valproic acid levels were also measured. The average age of the children was 10 years.

In all children, TPO antibodies were negative indicating no thyroid autoimmunity and T_4 and T_3 levels were in the normal range. Overall the TSH level was elevated in the children treated with valproic acid. The TSH level was >4 mU/L in 52% of the children taking valproic acid as compared with 17% of those not taking the drug. Further, a TSH >10 was found in 8.2% of the children taking valproic acid while none of the children not on the drug had a TSH >10. No child had symptoms or clinical features of hypothyroidism. Finally, the TSH normalized in 7/8 children that were taken off valproic acid.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Subclinical hypothyroidism is common in children on valproic acid and occurs in the presence of an otherwise normal thyroid gland. The cause of this is unknown but appears to be reversible when the drug is stopped. This study demonstrates that children on valproic acid should be screened periodically for hypothyroidism.

— Heather Hofflich, DO

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

Subclinical Hypothyroidism: a mild form of hypothyroidism where the only abnormal hormone level is an increased TSH. There is controversy as to whether this should be treated or not.

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.

TPO antibodies: these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.