



THYROID AND THE HEART

WHAT IS THE STUDY ABOUT?

Thyroid hormone has many effects on the heart. For example, hypothyroidism causes the heart not to beat as strong or as fast, although most of these effects are mild. Treatment with thyroid hormone returns heart function to normal. Heart function may also be decreased in very sick patients in the hospital who have infections, liver disease or other major illnesses, even though they do not have heart disease. In these patients, the heart function returns to normal after they get better. Thyroid hormone levels are decreased in these very sick patients due to their illnesses for reasons that are unclear. Treating these sick patients with thyroid hormone does not help. This study looked at whether the decreased heart function was related to the low thyroid levels in these sick patients.

THE FULL ARTICLE TITLE: Lee SJ, Kang JG, Ryu OH, Kim CS, Ihm SH, Choi MG, Yoo HJ, Hong KS. The relationship of thyroid hormone status with myocardial function in stress cardiomyopathy. *Eur J Endocrinol/ EJE-08-0808* [Pii] 10.1530/EJE 2009[doi]

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine if the decreased heart function in very sick hospitalized patients was related to the low thyroid levels found in these sick patients.

WHO WAS STUDIED?

The study group was 45 hospitalized patients that did not have heart disease but had decreased heart function treated at the Hallym University Sacred Heart Hospital in Korea from January 2003 through December 2006. These patients had pneumonia, liver disease, kidney infection or other infections. This group was compared to 58 healthy people without these illnesses and 31 hospitalized patients who had the same illnesses but normal heart function.

HOW WAS THE STUDY DONE?

Everyone in this study had blood thyroid levels and heart function measured. The thyroid levels that were measured were thyroxine (T_4), triiodothyronine (T_3) and TSH. Heart function was measured by blood pressure, heart echo measurements and blood levels of heart-related proteins, including BNP, a hormone that is increased in heart failure. Thyroid levels and heart function were measured in the study patients while they were sick and after they got better.

WHAT WERE THE RESULTS OF THE STUDY?

T_3 levels were much lower in the study patients when they were sick than when they got better. T_4 and TSH levels remained normal. When the study patients were sick, their

blood pressure was lower, their heart function by heart echo was lower and the BNP levels were higher than when they got better. After they study patients got better, their T_3 levels, blood pressure, heart function and BNP levels were the same as the healthy patients. This study showed that T_3 levels are related to heart function in sick patients and that sick patients with decreased heart function have lower T_3 levels.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

It has been shown in many other studies that T_3 levels are lower in sick patients than in healthy individuals and that the T_3 levels become normal after sick patients recover. Several other studies have shown that patients with heart failure, both in the hospital and after recovery, have lower T_3 levels than normal and that the lower the T_3 levels, the worse the patient does. This study shows that patients without heart disease also have low T_3 levels if their heart function decreases when they are sick.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The low T_3 levels in sick patients is related to decreased heart function in these patients.

— Alan P. Farwell, MD

ATA THYROID BROCHURE LINKS

Thyroid Function Tests: http://thyroid.org/patients/patient_brochures/function_tests.html

Hypothyroidism: http://thyroid.org/patients/patient_brochures/hypothyroidism.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.

Thyroxine (T_4) — 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

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

Heart echo — a test that uses sound waves to measure how well the heart is working and how the heart valves are moving

BNP — a hormone produced by the heart that is increased in heart failure