



## HYPERTHYROIDISM

### Relatively high serum free thyroxine concentrations are associated with higher risk of sudden cardiac death in the Rotterdam study

#### BACKGROUND

Sudden cardiac death is defined as “unexpected natural death from a cardiac cause within 1 hour from the onset of symptoms in a person without any previous condition that would appear fatal”. Thyroid hormone has clear effects on the heart. A major symptom of hyperthyroidism is palpitations, or heart racing. Indeed, an irregular heart rhythm known as atrial fibrillation is also common in hyperthyroidism. If severe, atrial fibrillation can lead to heart failure and is a cause of the rare deaths due to hyperthyroidism. However, information regarding hyperthyroidism and sudden cardiac death is limited. Further, there is no information linking thyroid hormone levels and sudden cardiac death. The present study examined the relationship between sudden cardiac death and thyroid function tests, focusing on subjects who would be considered not to be hyperthyroid.

#### THE FULL ARTICLE TITLE

Chaker L et al. Thyroid function and sudden cardiac death: a prospective population-based cohort study. *Circulation* 2016;134:713-22.

#### SUMMARY OF THE STUDY

The study included a group of middle to older aged subjects from the Rotterdam Study in the Netherlands which investigated a variety of medical conditions in older people. There were 3 groups analyzed: Cohort I (C1) included those in whom baseline data were collected from 1990 to 1993 and were 55 years of age or older during the baseline period and Cohort II (C2) included participants in whom baseline data were collected from 2000 to 2001 who were also 55 years of age or older during the baseline period. Cohort III (C3) were 45 years of age or older during the period from 2006 to 2008, when their baseline data were collected. Most of the people had serum TSH and FT<sub>4</sub> measured at the first visit. A total of 10,318 participants were followed from the time of baseline testing until sudden

cardiac death or death from other causes. Of these, 8881 participants had serum TSH values in the reference range of 0.4 to 4.4 mIU/L. Medical records and death certificates were the source of information regarding the diagnosis of sudden cardiac death. Baseline evaluations included a physical examination, electrocardiogram, a panel of laboratory measurements, and a detailed history.

The 10,318 study participants were followed for a maximum of 21.2 years, with an average follow-up of 9.2 years. There were 261 cases of sudden cardiac death. In the entire group, higher levels of FT<sub>4</sub> were associated with an 87% increase in the risk of sudden cardiac death. In euthyroid participants, higher levels of FT<sub>4</sub> were associated with a >2-fold risk of sudden cardiac death. In euthyroid participants, the 10-year risk for sudden cardiac death increased from 1% to almost 4% with increasing FT<sub>4</sub> values.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In subjects 45 years of age or older at baseline who are euthyroid by conventional criteria, higher FT<sub>4</sub> levels at baseline are associated with an increased occurrence of sudden cardiac death over the next decade. However, this study demonstrates only an association and not a cause and effect. Further, there is nothing in this study that would suggest any therapy would be indicated. Additional clinical trials are also needed to confirm these results.

— Alan P. Farwell, MD, FACE

#### ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): <http://www.thyroid.org/hyperthyroidism/>

Graves' Disease: <http://www.thyroid.org/graves-disease/>

Thyroid Function Tests: <http://www.thyroid.org/thyroid-function-tests/>

**HYPERTHYROIDISM**, 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.

**Subclinical Hyperthyroidism:** a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

**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.

MARCH  
**Medullary Thyroid Cancer**  
*Awareness Month*



THE AMERICAN THYROID ASSOCIATION

## Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of **March** is **Medullary Thyroid Cancer Awareness Month** and a bracelet is available through the ATA Marketplace to support thyroid cancer awareness and education related to thyroid disease.

