



## THYROID AND THE HEART

### TSH levels and the risk of death

#### BACKGROUND

There are clear effects of thyroid hormone on the heart. Some clinical studies have shown an increased risk of heart disease and death in patients with hypothyroidism, both mild and overt. Similarly, there have been some reports of and increased risk of death in patients with overt hyperthyroidism (Graves' disease) and there is a clear risk of a normal heart rhythms (atrial fibrillation) in individuals with a low TSH for any reason. Further, an association has been suggested between TSH levels near the upper limit of the normal range and death in some studies. This study evaluates the risk of death associated with levels of TSH in the normal range.

#### THE FULL ARTICLE TITLE

Inoue K et al. Association between serum thyrotropin levels and mortality among euthyroid adults in the United States. *Thyroid*. September 13, 2016

#### SUMMARY OF THE STUDY

This study looked at approximately 13,000 adults who had a TSH blood test. The data was obtained from individuals who participated in the National Health and Nutrition Examination Survey (NHANES) III from the years 1988 through 1994. Associations between thyroid tests (TSH) and death from all causes, heart disease and cancer was studied. The reference normal range for the TSH test in this survey was 0.39 to 4.60 mIu/l. A similar study was then also done in the survey from later years (between 2001 to 2010) that also had the thyroid hormone free T<sub>4</sub> levels available.

Overall, a higher risk of death from heart disease and cancer as well as death from all causes was noted in those individuals who had the TSH levels in the low normal (average 0.83) or high normal (average 2.64) range. Further analysis of the groups from 2000 to 2010 no such association with high TSH or low free T<sub>4</sub> levels.

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

Although the study suggests an association between an increased risk of death and either low or high normal TSH levels, the data is not conclusive. Importantly, this study looked at associations, not causes, and is not saying that thyroid function in the normal range contributed to the increased risk of death. There were limitations including the inconsistencies between the older and newer surveys. There were also age differences noted among groups. Perhaps normal TSH reference levels for a population will need to be defined better in the future.

—Vibhvasu Sharma, MD

#### ATA THYROID BROCHURE LINKS

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

Hypothyroidism (Underactive): <http://www.thyroid.org/hypothyroidism/>

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

#### ABBREVIATIONS & DEFINITIONS

**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.

**Thyroxine (T<sub>4</sub>):** the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.