



## HYPOTHYROIDISM

### WHAT IS THE STUDY ABOUT?

The diagnosis of hypothyroidism is made most often by increased levels of Thyroid Stimulating Hormone (TSH). The upper normal limit of TSH is the subject of considerable controversy. Depending on the population and database, the upper limit of normal can be reported as high as 4-5. Some groups recommend a lower upper limit in the 2.5-3 range. These two extremes would result in different numbers of people being told that they have mild hypothyroidism. As a result, the TSH normal range limits, as determined from national databases, have not yet been uniformly applied to clinical practice. This study looked at whether the levels of TSH changed according to age groups and ethnic groups.

**THE FULL ARTICLE TITLE:** Boucai L, Surks MI. Reference limits of serum TSH and free T<sub>4</sub> are significantly influenced by race and age in an urban outpatient medical practice. *Clin Endocrinol (Oxf)* 2009;70:788-93.

### WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to see if there were differences in TSH levels that could be attributed to age and race.

### WHO WAS STUDIED?

The study patients were identified from outpatient medical practices of the Montefiore Medical Center, Bronx, New York. A total of 22,116 patients without thyroid problems had TSH levels done; 16,343 were female (74%) and 5773 were male (26%), and all were older than 10 years of age. The adult population was represented by 18,243 patients (83%) older than 20 years of age. The self-designated race distribution was 32.8% black or African American, 14.7% white, 5% Hispanic in 5%, and 47.5% undesignated.

### HOW WAS THE STUDY DONE?

The records of the patients were reviewed as to age, race and TSH levels. The TSH levels were compared to national reference ranges.

### WHAT WERE THE RESULTS OF THE STUDY?

This study found that, indeed, TSH levels significantly varied according to race and age. Differences in TSH levels were seen in African American and Hispanic populations compared to white populations, for example. Older (>80 years) people have higher TSH levels in all races, while whites tend to have higher TSH readings than African American across all ages. The study concluded that the

yardstick for measuring TSH differs between races and with age and unless this yardstick is adapted to account for age and race, many people will be misdiagnosed as hypothyroid when they are not; or misdiagnosed as hyperthyroid, when they are not.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

The issue of whether mild increases in TSH indicate hypothyroidism and should be treated as opposed to indicating normal variations has been discussed and debated in many articles for the last 5–10 years. This study is yet more evidence that older patients may have a different normal range as was reported in last month's issue of *Clinical Thyroidology for Patients* (Atzmon et al as cited in Farwell, 2009). This also provides information that there may be differences in TSH normal ranges between races. (Farwell A. *Clinical Thyroidology for Patients* [serial online]. 2009;2(2):3. Available at: [http://www.thyroid.org/patients/ct/volume2/issue2/ct\\_patients\\_v22\\_3.pdf](http://www.thyroid.org/patients/ct/volume2/issue2/ct_patients_v22_3.pdf). Accessed August 18, 2009.)

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The implications of this study are that we are not using accurate yardsticks for measuring TSH in many groups of patients, and this is causing many to be misdiagnosed as hypothyroid when they are not, or even hyperthyroid, when they are not. These type of results can be explained by a historical exclusion of minorities from clinical studies, originally done to protect certain populations from abuses in clinical research. We can see now that we have a lot to learn about normal ranges in different ethnic groups.

— M. Sara Rosenthal, PhD

### ATA THYROID BROCHURE LINKS

Hypothyroidism: [http://thyroid.org/patients/patient\\_brochures/hypothyroidism.html](http://thyroid.org/patients/patient_brochures/hypothyroidism.html)

Thyroid Function Tests: [http://thyroid.org/patients/patient\\_brochures/function\\_tests.html](http://thyroid.org/patients/patient_brochures/function_tests.html)

### 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.

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.