

 [Print this Page for Your Records](#)[Close Window](#)**Establishment of TSH Reference ranges in geriatric population: relevance to thyroid pathophysiology.****Topic:** Endocrinology/Hormones**R. H. Khoury<sup>1</sup>, P. Gudaitis<sup>1</sup>, P. M. Sluss<sup>2</sup>, D. Gudaitis<sup>1</sup>, B. P. Salmon<sup>1</sup>, A. Gandhi<sup>1</sup>, A. V. Gudaitis<sup>1</sup>.** <sup>1</sup>*Aculabs, Inc., East Brunswick, NJ,*<sup>2</sup>*Massachusetts General Hospital, Boston, MA,***Presentation Number:** D-132**Keyword:** TSH, geriatric

**Background:** TSH is a pituitary glycoprotein hormone that controls the biosynthesis of thyroid T4 and T3. It is secreted under the influence of hypothalamic TRF hormone and the negative feedback regulation by the thyroid hormones. Because peripheral TSH concentration is an early marker of thyroid diseases, the need for sensitive assays with well-established reference ranges is growing. Recently recommendations to adjust the lower and upper limit of the reference range to aid in the diagnosis of subclinical thyroid dysfunction have appeared. In the elderly population, hypothyroidism and hyperthyroidism are more prevalent than in younger population. Additionally, the incidence of subclinical hypothyroidism is much higher than overt hypothyroidism in the elderly.

**Methods:** We analyzed data collected from 10927 samples over a period of 3 months from patients tested in our laboratory using Immulite 3<sup>rd</sup> generation TSH assay. We calculated the incidence of hypothyroidism [elevated TSH] and subclinical hypothyroidism by age group, as well as age-specific reference intervals for patients with TSH levels < 5.0. Patient data was separated into 6 age groups: <50, 51-65, 66-75, 76-85, 86-99, >100. The prevalence of elevated TSH in each group was calculated based on TSH cut-offs of > 4.5 or TSH > 5.0 uIU/mL. Patients with TSH values between 4.5 and 5.0 uIU/mL were reviewed for indications of subclinical hypothyroidism. Patients with documented thyroid problems, TSH levels > 5.0 and specimens with intra-individual differences >1 uIU/mL were excluded from a calculation of the age-specific reference ranges. Reference intervals were calculated using nonparametric analysis of data from more than 6200 specimens.

**Results:** The percentage of patients with TSH values > 5 uIU/mL increased with age from 9.4 % in < 50 years old to 26.7 % in those > 100 years old group. Using a TSH cut-off of > 4.5 uIU/mL we observed the same trend with increase from 12.1% for those <50 years old to 31.6% for those >100 years old. 23.7 % of patients with TSH levels between 4.5 and 5.0 and no documented thyroid problem had an increase in their TSH to more than 5.5 in subsequent blood tests. Lowering the upper limit to 4.0 did make a statistical difference in the percentage of patient's in which a subsequent hypothyroid TSH level was observed. The percentage of patients with TSH levels < 0.4 increased with age from 6.8% to 11.2 % in the < 50 and >100 years old groups, respectively. Reference intervals calculated for patients with TSH levels < 5.0 ranged from 0.36 to 4.7 depending on group; for all ages the calculated reference interval was 0.4 to 4.5 uIU/mL

**Conclusion:** Thyroid dysfunction based on biochemical indices is more common in elderly people and increases with age. Elevated TSH is more common than suppressed TSH in the elderly. Almost one fifth of the study population who had TSH levels between 4.5 and 5.0 went on to develop overt hypothyroidism. Lowering the upper limit to 4.5 allowed detecting more subclinical hypothyroidism based on the incidence of subsequent hyperthyroid levels of TSH.

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