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THYROID IN THE ELDERLY

The risk of dying may be higher in older patients whose levels of TSH and free T_4 are more variable

BACKGROUND

Thyroid stimulating hormone (TSH) is produced by the pituitary gland in the brain, and acts on the thyroid gland to control thyroid function, which in turn controls metabolism. TSH levels are opposite thyroid hormone levels. When thyroid hormone levels are low and the gland is underactive, TSH levels are high. When the thyroid is overactive and thyroid hormone levels are high, TSH levels are low. While there may be minor changes in TSH levels during the course of the day, in general, both TSH and thyroid hormone levels are stable over time. However, in some individuals, TSH levels are more variable and it is known that TSH levels are generally higher in older adults than in younger people. This study aimed to determine changing thyroid function (variability) with aging and examine the association of these changes with survival, by analyzing thyroid function over time. The authors included participants from the Baltimore Longitudinal Study of Aging (BLSA), which is a long-term study of aging with continuous enrollment of healthy volunteers living independently in the community.

THE FULL ARTICLE TITLE

Mammen JS et al. Unstable thyroid function in older adults is caused by alterations in both thyroid and pituitary physiology and associated with increased mortality. Thyroid, 2017 Nov;27(11):1370-1377.

SUMMARY OF THE STUDY

The study included 1294 participants in the BLSA who had normal thyroid function tests and were not on any thyroid hormone medications or other medications known to interfere with thyroid function. Of these participants, 464 were younger than 60 years old at the start of the study, 291 were aged 60-69, 327 were aged 70-79 and 206 were over 79 years old. The study focused on a subgroup of 640 participants who had at least three tests of TSH and free T_4 over seven years.

The study found that while most of the participants at all ages had stable thyroid function, changes were more common among older adults. More specifically, 32.3% of those aged >80 years demonstrated changes in thyroid function (TSH and free T_4) versus only 9.5% of those aged <60 years. Race and ethnicity were not associated with thyroid aging pattern, but smoking within the past 10 years increased the risk for changing thyroid function. Overall, participants who showed variability in both TSH and in free T_4 levels in this study seemed to be at increased risk for death.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that TSH and free T_4 levels tend to be more variable in the elderly, but there is a tendency for abnormal thyroid function tests to resolve. Participants who showed variability in both TSH and in free T_4 levels in this study seemed to be at increased risk for death. However, it is important to note that not all rising TSH levels will be associated with the same risk or carry the same treatment implications. Additionally, testing thyroid function over time may be critical in older patients to avoid treating abnormalities that may be temporary. Finally, physicians should be cautious of a mildly elevated TSH level, as it may not require treatment with thyroid hormone supplementation in some older patients.

— Maria Papaleontiou, MD

ATA THYROID BROCHURE LINKS

Older Patients and Thyroid Disease: https://www.thyroid.org/thyroid-disease-older-patient/

Thyroid Function Tests: https://www.thyroid.org/thyroid-function-tests/

THYROID IN THE ELDERLY, continued

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.

Pituitary gland: this endocrine gland sits at the base of the brain and secretes hormones that control thyroid and adrenal function, growth and reproduction. The pituitary gland secretes TSH to control thyroid function.

Thyroxine (T4): the major hormone produced by the thyroid gland. T_4 gets converted to the active hormone T_3 in various tissues in the body.

Free T4: some of the T_4 in the blood exists as free T_4. This means it hasn't bonded to protein in the blood.

Variability: Lack of consistency or fixed pattern, liability to change.

Aging: Process of becoming older.