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A MONTHLY NEWSLETTER FOR OUR HIGHLY VALUED CENEGENICS PATIENTS

For Women Only: Low or High Thyroid Hormone Levels Linked to Dementia

New research reveals that older women with low or high levels of thyrotropin—a thyroid hormone—have double the risk for Alzheimer's disease.

In July 2008, "Thyroid Function and the Risk of Alzheimer Disease . . . The Framingham Study" appeared in the *Archives of Internal Medicine*, a bimonthly publication of the American Medical Association. Leading the research was gerontologist and internist, Zaldy Tan, MD, MPH, director of The Memory Clinic at the Beth Israel Deaconess Medical Center and Harvard Medical School Division on Aging, and researcher at the MIT AgeLab.

Sparking the research were recognized causes of reversible dementia: clinical hypothyroidism [underactive thyroid] and hyperthyroidism [overactive thyroid]. However, previous studies had inconsistent results regarding thyrotropin levels' impact on cognitive performance in clinically euthyroid persons (those with normal thyroid gland function).

Per this latest study, evidence is growing that links "alterations in the endocrine system to pathogenesis of Alzheimer disease and other dementias." Other implicated contributors to dementia are insulin resistance, elevated cortisol levels, diminished estrogen levels and low testosterone levels. Thyroid dysfunction "has emerged as a possible risk factor for irreversible dementia in several epidemiologic studies implicating hypothyroidism and hyperthyroidism."

Researchers collected data from the Framingham Study—a community-based study of 5,209 participants who were evaluated for cardiovascular risk factors every two years since 1948—in hopes of further clarifying the thyroid function and dementia connection. Eligible participants from the Framingham Study were those examined during March 1977 to November 1979, who were dementia free for three years and had thyrotropin levels screened.

A standardized neuropsychological test battery helped investigators establish their dementia-free cohort. Every participant underwent "baseline neurologic and neuropsychological examinations" and was reassessed systematically for the onset of moderate to severe dementia. Investigators also used data from hospital records, primary care physicians, family interviews, computed tomography and magnetic resonance imaging records as well as autopsy confirmation when available.

The standard screening test for suspected dementia is measuring serum thyrotropin levels, which was used during the biennial examination. The research team "related serum thyrotropin concentrations" to the Alzheimer disease risk in 1,864 cognitively intact, clinically euthyroid Framingham original cohort participants (mean age 71 years; 59% women). Hormone levels were later divided into tertiles per serum concentrations.

Findings. After making adjustments for age, apolipoprotein E $_{\varepsilon}$4 allele status, educational level, plasma homocysteine level, current smoking, body mass index, prevalent stroke and artrial fibrillation, these observational findings were reported:

- During the 12.7-year follow-up, 209 participants developed Alzheimer's disease—142 were women.
- Women in the lowest (<1.0 mIU/L) and highest (>2.1 mIU/l) tertiles of serum thyrotropin concentration were at increased risk for Alzheimer's—demonstrating two times the risk of Alzheimer's disease than those with moderate thyroid levels.
- Men did not exhibit a relationship between thyrotropin levels and Alzheimer's.
- Researchers could not determine if thyroid function deteriorated, contributing to the development of Alzheimer's or if it deteriorated as a result of Alzheimer's.

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Potential new standard on the horizon. At the crux of their findings, researchers say questioning current "normal" thyroid hormone level standards may be in order. Further research is needed, yet Tan postures that, in lieu of the recent findings, our target levels (0.5 to 5.0 mIU/L) may be too broad, but found the association at both ends of the spectrum enlightening.

In an online July 31 *Medscape* article about the study, Tan reportedly said the brain "tries to maintain thyroid levels at a relatively narrow range," which may indicate optimal function lies within that range. Below or above that is "not a good thing" since higher thyroid levels "could increase oxidative stress" while lower levels "might affect brain tissue and circulating levels of beta amyloid peptide." Abnormal accumulations of fibrous proteins called amyloids are linked to neurodegenerative diseases. A beta amyloid peptide is the main component of amyloid plaques found in the brains of Alzheimer individuals.

While this study helped clarify the connection between dementia and the endocrine system, there are still many questions to be answered, such as how thyrotropin levels affect cognitive function and why it affects women more than men. We do know there is a definite connection between the central nervous system and thyroid hormone function. For instance, hypothyroidic individuals are more apt to have depression and hyperthyroidic patients battle with confusion. The $64 million question is . . . what is that connection?

In the previously mentioned *Medscape* article, Tan says in today's clinical practice, thyroid dysfunction is underdiagnosed, causing a call for more intense screening. In response, the American Association of Clinical Endocrinologists "has proposed modifying target thyrotropin levels" to a narrower range of 0.3 to 3.04 mIU/L.

Cenegenics: Fundamental to better health. As you can see by this recent study and others, hormonal health plays an intricate part in your overall well-being. Too often the endocrine system—which is made up of hormone-secreting glands including the thyroid—is overlooked in conventional healthcare.

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