

Overdiagnosis of Hypothyroidism

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Wellness Forum Health recently concluded our annual Prevent Cancer Campaign for 2023, and during the campaign, this newsletter featured several articles concerning the overdiagnosis of cancer and how common overtreatment – sometimes dangerous and harmful overtreatment – has become.

Overdiagnosis and overtreatment is not limited to just cancer. It's common in other areas of health too. Take hypothyroidism, for example. Thyroxine and levothyroxine, prescribed for treatment of hypothyroidism, are two of the ten most commonly prescribed drugs in the U.S. But how many people really benefit from taking these drugs?

Hypothyroidism is diagnosed with a blood test that measures thyroid stimulating hormone, or TSH. Elevated levels can be an indicator for hypothyroidism. But elevated TSH does not necessarily mean that a person has hypothyroidism. There are several reasons why TSH levels may be outside of reference ranges, and most of them do not involve hypothyroidism.

First, it is only recently that doctors started measuring TSH levels in asymptomatic people. Lab results, which formerly measured a few biomarkers like plasma cholesterol and fasting glucose, have grown longer and longer as more and more biomarkers are being measured in mostly healthy people – a process we refer to as disease mongering. The more doctors look for abnormalities, the more of them they find, and diagnosing people with more and more conditions is profitable for both medical centers and drug companies. I may not, however, benefit patients. The U.S. Preventive Services Task Force advises against testing asymptomatic adults for thyroid function.¹

Another issue is changing reference ranges. Over the last three decades, the upper reference limit for TSH has gradually been lowered from 10 mIU/L to between 2.5 and 3.5 mIU/L. This change was not in response to evidence that people within the former reference ranges had hypothyroidism and were not receiving treatment for it; it was due to increased sensitivity of the assays and committees staffed with people who worked for companies that make drugs to treat hypothyroidism.² In 2002, the American Association of Clinical Endocrinologists suggested that the upper limit for TSH should be lowered to 3.0 mIU/L.³

Little consideration is given to many factors that influence TSH levels, including ethnicity, iodine intake, gender (women test higher than men), pregnancy, and body mass index.⁴ TSH is elevated in obese people and does not always reflect hypothyroidism, but rather the body's efforts to compensate for excess weight. In fact, while obesity is sometimes attributed to hypothyroidism, the reverse can also be true –

hypothyroidism can result from obesity.⁵ People who lose weight usually have lowered TSH levels as weight is lost, and lifestyle changes such as increased physical activity can lower TSH levels even without weight loss.⁶

TSH levels increase as people age, and studies of centenarians show that higher TSH levels are associated with increased longevity.⁷ It is particularly dangerous to over-diagnose and overtreat hypothyroidism in the elderly since overtreatment can cause cardiac arrhythmias and decreased bone density.⁸

Time of day matters too. Early in the morning and at night, TSH is much higher than it is in the afternoon.⁹ Lack of sleep can cause TSH levels to be significantly higher in the morning as well.¹⁰ This means that the time that a blood draw is performed matters, but this is rarely taken into consideration.

TSH fluctuates based on the time of year, rising higher in the winter, and then lowering as the weather becomes warmer.¹¹ Researchers living in the Arctic are known to have significantly higher TSH levels than people living in warmer areas of the world.¹²

A combination of changed reference ranges and ignoring other factors that influence blood test results has led to considerable over diagnosing and overmedicating of adults for hypothyroidism. Asymptomatic adults are almost always better off not having TSH measured. Asymptomatic adults with elevated TSH, based on today's reference ranges, should generally be left alone. Adults with symptoms and elevated TSH levels should first be counseled on how to improve their health to lower TSH and to protect their thyroid before medication is prescribed. Many people won't require treatment if they change their diets, lose weight, exercise, and make other important changes to their habits and their health.

Medication for hypothyroidism should be reserved for only those individuals who have symptoms and for whom diet and lifestyle changes have not resolved their issues. The decision to take medication should be carefully considered. In our experience, the longer a person is medicated, the more difficult it is to discontinue the drugs.

¹ <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/thyroid-dysfunction-screening>

² Deary M, Buckley T, Soldin OP. "TSH – clinical Aspects of its Use in Determining Thyroid Disease in the Elderly. How Does It Impact the Practice of Medicine in Aging?" *Adv Pharmacoeconomol Drug Saf* 2012 Oct;1(119):9369

³ Baskin HJ, Cobin RH, Duick DS et al. "American Association of Clinical Endocrinologists medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism." *Endocr Pract.* 2002 Nov-Dec;8(6):457–69

⁴ Biondi B. "The normal TSH Reference Range: What Has Changed in the Last Decade?" *JCEM* 2013 Sep;98(9):3584-3587

⁵ Sanyal D, Raychaudhuri M. "Hypothyroidism and obesity: An intriguing link." *Indian J Endocrinol Metab* 2016 Jul-Aug;20(4):554-557

⁶ IBID

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- ⁷ Atzmon G, Barzilai N, Hollowell JG, Surks MI, Gabriely I. "Extreme longevity is associated with increased serum thyrotropin." *J Clin Endocrinol Metab.* 2009 Apr;94(4):1251–1254.
- ⁸ Gluvic Z, Obradovic M, Stewart A et al. "Levothyroxine Treatment and the Risk of Cardiac Arrhythmias – Focus on the Patient Submitted to Thyroid Surgery." *Front Endocrinol (Lausanne)* 2021 Nov;12:758043
- ⁹ Mahadevan S, Sadacharan D, Kannan S, Suryanarayanan A. "Does time of Sampling or Food Untake Alter Thyroid Function Test?" *Indian J Endocrinol Metab* 2-17 May-Jun;21(3):369-372
- ¹⁰ Nazem MR, Bastanhagh E, Emami A, Hedayati M, Samimi S, Karami M. "The relationship between thyroid function tests and sleep quality; cross sectional study." *Sleep Sci* 2021 Jul-Sep;14(93):196-200
- ¹¹ Yamada S, Horiguchi K, Akuzawa M et al. "Seasonal Variation in Thyroid Function in Over 7,000 Healthy Subjects in an Iodine-sufficient Area and Literature Review." *J endocrine Soc* 2022 Jun;6(6):bvac054
- ¹² Reed HL, Reedy KR, Palinkas LA, et al. "Impairment in cognitive and exercise performance during prolonged antarctic residence: effect of thyroxine supplementation in the polar triiodothyronine syndrome." *J Clin Endocrinol Metab.* 2001 Jan;86(1):110-116.