57th Annual Primary Care Review: Approach to Hypothyroidism

Chaim Vanek MD (vanekc@ohsu.edu)

OHSU Associate Professor, Endocrine

February 10th, 2026

When to check a TSH?

- For any patient complaint
- TSH = Thyroid Stimulating Hormone = Thyrotropin
  - Secreted by pituitary gland
    - Key lab value to assess thyroid function
      - Hypothyroid and Hyperthyroid

Background

- Review my approach
  - Follows 2014 American Thyroid Association (ATA) guidelines when possible
- Discuss 5 scenarios:
  1. TSH level 0.4 to 2.5 uIU/mL
  2. TSH level 2.5 to 5.0 uIU/mL
     i. TPO Negative vs. Positive
  3. TSH level 5.0 to 10.0 uIU/mL
     i. Young vs. Elderly
  4. TSH level over 10.0 uIU/mL
     i. Young vs. Elderly
  5. Hypothyroidism in Pregnancy
- General management principles
- Will not review pituitary disorders (central hypothyroidism)

1) TSH level: 0.40 to 2.50 uIU/mL

- 100% normal for all age groups and genders
- Symptoms are not from the thyroid
- No need for Free T4 level

2) TSH level: 2.5 to 5.0 uIU/mL

- Check thyroid antibody (TPO; Thyroid Peroxidase Antibody)
  - Thyroglobulin antibody less useful

2) TSH level: 2.5 to 5.0 uIU/mL
TPO Ab: Negative

- Unlikely to have clinical hypothyroidism as cause of symptoms
  - A normal Free T4 also supports normal thyroid function
- If patient insists on therapy:
  - Levothyroxine 25 mcg daily for 3 months to gauge symptoms improvement and reduction of TSH to less than 2.5 uIU/mL
- If patient happy with clinical outcome then continue but make patient 100% aware that once on thyroid, always on thyroid
  - Lifelong commitment

2) TSH level: 2.5 to 5.0 uIU/mL
TPO Ab: Positive

- Women of childbearing potential
  - Consider Levothyroxine 25-50 mcg to keep TSH under 2.5 uIU/mL
  - Will possibly improve future fertility
  - 1st trimester TSH goal is less than 2.5 uIU/mL
    - Patient at goal at the time of pregnancy
- Men under 60 / Women of non childbearing potential or less than 60
  - Monitor every 6 months for rise in TSH or
  - Trial of Levothyroxine as on prior slide or
  - Start Selenium 200 mcg supplementation daily
    - Mixed evidence that it supports thyroid function
      - Lowers TPO antibodies

Thyroid Journal 2010

I use it alone, not with Levothyroxine

Selenium Supplementation in the Treatment of Hashimoto's Thyroiditis: A Systematic Review and a Meta-analysis

Konstantinos A. Toulis, Athanasios D. Anastasilakis, Thrasivoulos G. Tzellos, Dimitrios G. Goulis, and Dimitrios Kouvelas

Published Online: 1 Oct 2010 | https://doi.org/10.1089/thy.2009.0351

Abstract

Background: Evidence suggests that selenium (Se) supplementation could be useful as an adjunctive therapy to levothyroxine (LT_4) in the treatment of Hashimoto's thyroiditis (HT). To summarize evidence regarding its effect on thyroid autoantibodies' titers, demands in LT_4 replacement therapy, ultrasonographic thyroid morphology, and mood in patients with HT under LT_4 treatment, a systematic review and meta-analysis of relevant literature were performed.

Methods: Systematic review of prospective studies involving patients with HT under LT_4 treatment and meta-analysis of studies on randomized, placebo-controlled, blinded trials were performed.

Results: Patients with HT assigned to Se supplementation for 3 months demonstrated significantly lower thyroid peroxidase autoantibodies (TPOab) titers (four studies, random effects weighted mean difference: −271.09, 95% confidence interval: −421.98 to −120.19, $p < 10^{-4}$) and a significantly higher chance of reporting an improvement in well-being and/or mood (three studies, random effects risk ratio: 2.79, 95% confidence interval: 1.21−6.47, $p = 0.016$) when compared with controls. Demands in LT_4 replacement therapy and ultrasonographic thyroid morphology were found either unaltered or underreported.

Conclusions: On the basis of the best available evidence, Se supplementation is associated with a significant decrease in TPOab titers at 3 months and with improvement in mood and/or general well-being. Evidence suggests a different pattern of

3) TSH level: 5.0 to 10.0 uIU/mL
TPO Ab: Negative or Positive

- Clinical symptoms more likely related to Hypothyroidism
- Men and women under age 60
- Consider Levothyroxine after discussion with patient
  - Calculate theoretical full weight-based dose
    - 1.7 mcg (micrograms) per Kg (kilograms)
    - Begin 50% of that calculated dose
      - Goal to get TSH under 3.0 in 6-8 weeks
        - Any TSH decline should correlate with improved patient well being
- I do not feel selenium is useful at this point
- Remember! Lifelong commitment

3) TSH level: 5.0 to 10.0 uIU/mL
TPO Ab: Negative or Positive

- Men and Women **over** age 60
- We have good data indicating that Levothyroxine does not improve wellbeing
- NEJM 2017 Vol: 376 (26)
- 737 subjects aged 65 and older with TSH of 6.4 ± 2.01 uIU/mL
- Randomized double blinded placebo-controlled study to Levothyroxine or placebo
  - Primary outcome: Hypothyroid tiredness score

Table 1. Characteristics of the Participants at Baseline.*

Characteristic	Placebo Group (N=369)	Levothyroxine Group (N=368)
Age — yr		
Mean	74.8±6.8	74.0±5.8
Range	65.1–93.4	65.2–93.0
Female sex — no. (%)	198 (53.7)	198 (53.8)
White race — no. (%)†	362 (98.1)	362 (98.4)
Standard housing — no. (%)‡	356 (96.5)	358 (97.3)
Previous medical conditions and clinical descriptors — no./total no. (%)		
Ischemic heart disease§	50/369 (13.6)	50/368 (13.6)
Atrial fibrillation	44/368 (12.0)	45/364 (12.4)
Hypertension	183/366 (50.0)	192/368 (52.2)
Diabetes mellitus	54/368 (14.7)	63/368 (17.1)
Osteoporosis	47/367 (12.8)	41/364 (11.3)
Current smoking	33/369 (8.9)	29/368 (7.9)
Median no. of concomitant medicines (IQR)	4 (2–6)	4 (2–6)
Median Mini–Mental State Examination score (IQR)¶	29 (28–30)	29 (27–30)
Weight <50 kg — no. (%)	5 (1.4)	5 (1.4)
Laboratory results		
Thyrotropin — mIU/liter	6.38±2.01	6.41±2.01
Median (IQR)	5.76 (5.10–6.94)	5.73 (5.12–6.83)
Range	4.60–17.60	4.60–17.60
Free thyroxine — pmol/liter‖	13.3±1.9	13.4±2.1

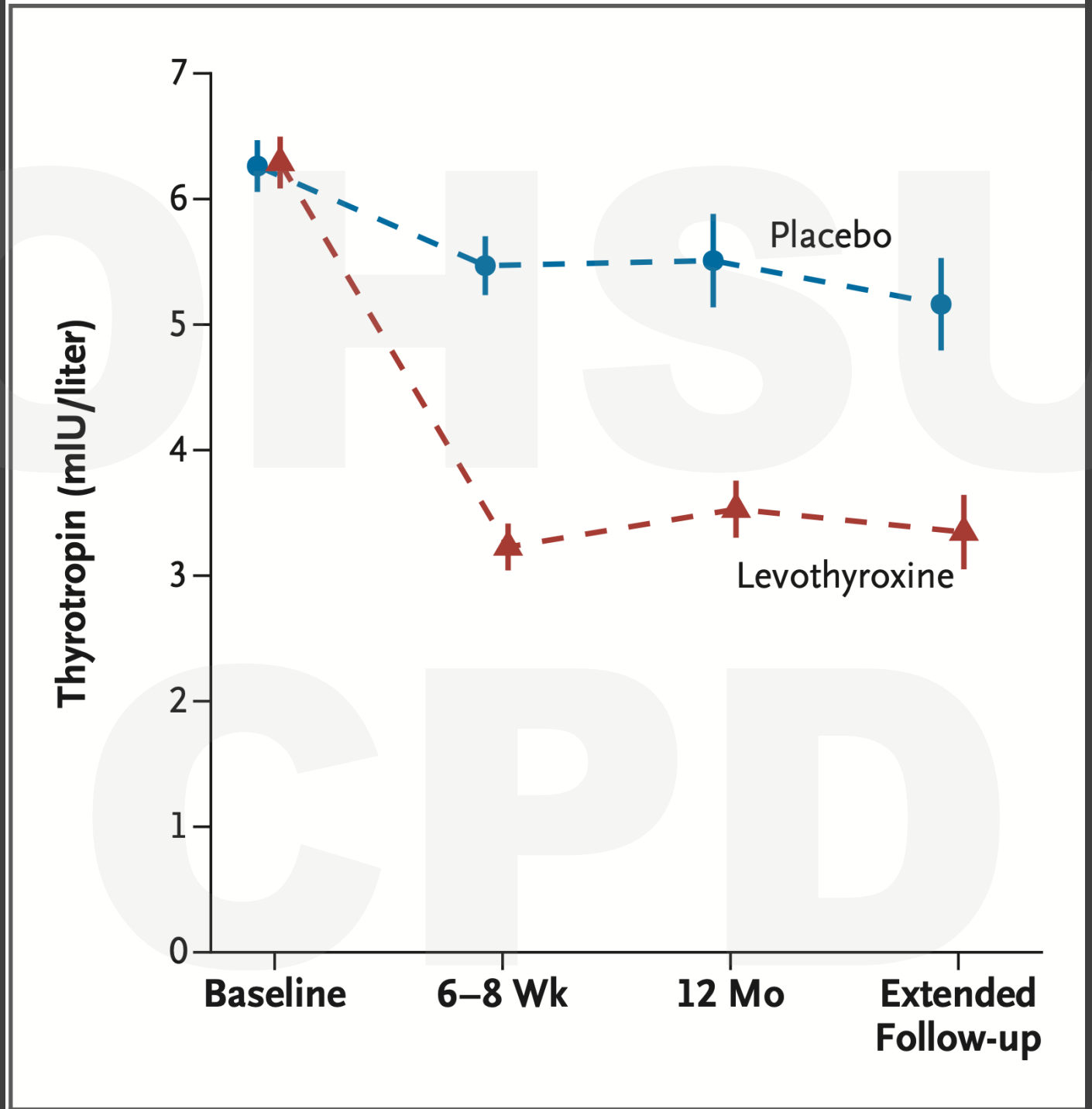
Thyrotropin (mIU/liter)
7
6
5
4
3
2
1
0
Placebo
Levothyroxine
Baseline
6–8 Wk
12 Mo
Extended Follow-up

Table 2. Outcomes at 12 Months and Extended Follow-up.*

Variable	Baseline		At 12 Mo			
	Placebo (N=369)	Levothyroxine (N=368)	Placebo (N=320)	Levothyroxine (N=318)	Difference (95% CI)	P Value
Thyrotropin — mIU/liter	6.38±2.01	6.41±2.01	5.48±2.48	3.63±2.11	−1.92 (−2.24 to −1.59)	<0.001
Median (IQR)	5.76 (5.10 to 6.94)	5.70 (5.12 to 6.83)	4.90 (3.91 to 6.46)	3.16 (2.45 to 4.22)	—	—
Primary outcomes‡						
Hypothyroid Symptoms score	16.9±17.9	17.5±18.8	16.7±17.5	16.6±16.9	0.0 (−2.0 to 2.1)	0.99
Tiredness score	25.5±20.3	25.9±20.6	28.6±19.5	28.7±20.2	0.4 (−2.1 to 2.9)	0.77

TSH reduction from 6.41 to 3.63 did NOT correspond to any improvement in symptoms

3) TSH level: 5.0 to 10.0 uIU/mL
TPO Ab: Negative or Positive

- Men and Women **over** age 60
- Article concludes “Levothyroxine provided no apparent benefits in older persons with subclinical hypothyroidism.”
- Subclinical hypothyroidism is when TSH is elevated but Free T4 is normal
  - Free T4 will remain normal until TSH rises above 10.0 uIU/mL
- This is why I do not check Free T4 often, the TSH will be high long before the Free T4 drops
  - The Free T4 does not provide additional decision making data
- Many elderly patients will still want levothyroxine therapy
  - Be sure to start no higher than 50 mcg daily

4) TSH level: Greater than 10.0 uIU/mL
TPO Ab: Negative or Positive

- Men and women under age 60
- Classic Primary Hypothyroidism
  - Free T4 has likely reduced into the abnormal LOW range
- Levothyroxine recommended
- Begin full weight-based replacement
  - 1.7 mcg / kg
    - Labs in 8 weeks

4) TSH level: Greater than 10.0 uIU/mL
TPO Ab: Negative or Positive

- Men and Women **over** age 60
  - Or any age with heart disease
- Calculate full weight-based dose
  - 1.7 mcg / kg
  - Begin Levothyroxine 50 mcg daily and titrate dose by 25 mcg every 2 weeks until reach full weight-based dose
- Full thyroid hormone replacement all at once can precipitate angina
  - Thyroid replacement increases cardiac demand

5) Levothyroxine During Pregnancy

- Immediately increase thyroid dose by 30% upon confirmation
  - Take NINE tablets per week (2 tablets on 2 days a week)
- Check TSH every 4 weeks of gestation until 32 weeks
- Goal TSH per trimester:
  - 1st: 0.1 to 2.5
  - 2nd: 0.2 to 3.0
  - 3rd: 0.3 to 3.0

Management of Levothyroxine Therapy

American Thyroid Association Guidelines 2014

- Check TSH level 6-8 weeks after starting therapy
  - No optimal goal level but I shoot for less than 2.5 uIU/mL in young patients
  - In elderly patients I remain around 4.0 to 8.0 uIU/mL
  - Do not suppress TSH levels (<0.10 uIU/mL) with treatment
- Once patient stabilized on a dose try to keep patient on the same manufacturer of the generic Levothyroxine or use brand name
- If patient non-adherent to regimen; can take all 7 days of Levothyroxine at once time once weekly
  - Nursing home and adult foster care patients
- Taken 60 minutes before breakfast or 3 hours after dinner at bedtime
  - Food decreases absorption by 15%

Fasting vs Nonfasting, Dose-adjusted Levothyroxine Ingestion in Hypothyroidism: A Randomized Clinical Trial

Jeresa I. A. Willems,[1] Daan J. L. van Twist,[1] Floris Helmich,[2] Thijs Sluiter,[1] Marco Medici,[3] Robin P. Peeters,[3] and Roderick F. A. Tummers-de Lind van Wijngaarden[1]

[1]Department of Internal Medicine, Zuyd Thyroid Center, Zuyderland Medical Center, 6162 BG Sittard-Geleen, The Netherlands
[2]Department of Clinical Chemistry and Hematology, Zuyderland Medical Center, 6162 BG Sittard-Geleen, The Netherlands
[3]Academic Center for Thyroid Diseases, Department of Internal Medicine, Erasmus Medical Center, 3015 GD Rotterdam, The Netherlands

Correspondence: Jeresa I. A. Willems, MD, Department of Internal Medicine, Zuyd Thyroid Center, Zuyderland Medical Center, Dr. H. van der Hoffplein 1, 6162 BG Sittard-Geleen, The Netherlands. Email: je.willems@zuyderland.nl.

Abstract

Introduction: Levothyroxine (LT4) is recommended for intake in a fasting state to optimize absorption. However, fasting intake is often burdensome and may reduce adherence. In a previous questionnaire study, we observed a strong patient preference for taking LT4 with breakfast. Therefore, we conducted a randomized controlled trial to evaluate whether nonfasting LT4 intake—accompanied by a 15% dose increase—could maintain TSH stability compared to fasting LT4 intake.

Methods: Adults with well-controlled hypothyroidism were randomized to fasting or dose-adjusted, breakfast LT4 intake. TSH, free T4, and total T3 were measured every 6 weeks, followed by LT4 dose adjustment if needed. The primary outcome was TSH stability, defined as 2 consecutive values within the reference range and a maximum ±1 mIU/L change from baseline. Patients were followed until TSH stability was reached, with a maximum of 24 weeks. After the initial study period, patients in the fasting group were invited to cross over to nonfasting intake, with similar follow-up.

Results: Eighty-eight patients (80.7% female, median age 62y [interquartile range: 49-69]) were randomized to fasting (n = 43) or breakfast intake (n = 45). TSH stability was comparable between groups: 74.4% [95% confidence interval (CI): 61.0-88.0%] in the fasting vs 73.3% (95%CI: 60.0-87.0%) in the breakfast group (P = not significant). Similar findings were observed in the crossover group. The breakfast group reported greater improvement in self-reported well-being (33.3% vs 16.3%, $P = .07$) and a stronger preference for nonfasting intake (76.2% vs 44.2%, $P < .001$). By the end of the study, 88.9% chose to continue nonfasting intake.

Conclusion: LT4 ingestion with breakfast with a 15% dose increase maintained TSH stability and improved patient well-being. Given the strong patient preference, this patient-centered approach may offer a viable alternative to fasting administration.

Journal of Clinical Endocrinology and Metabolism 2025

Management of Levothyroxine Therapy

American Thyroid Associated Guidelines 2014

- Levothyroxine preferred over over thyroid extracts (Armour™, NP-Thyroid etc..)
  - Safety concern that extracts contain excess T3 (triiodothyronine)
- Perceived allergy/intolerance to inactive dyes/fillers
  - Use colorless (white) 50 mcg tablet
  - Use gelatin based Levothyroxine (Tirosint™) – capsule and liquid formulations
    - I use in patients on high dose proton pump inhibitor drugs or malabsorption
- T3 (liothyronine) should not be routinely used
  - T3 levels are not useful
  - If forced to do so start 5-10 mcg daily AND reduce Levothyroxine dose by 15 to 30 mcg daily. Do not use in elderly or cardiac patients

Hypothyroid Summary

- A lot of individual decision making
- Levothyroxine is safe as long as patient not over treated
  - Never suppress TSH levels with Levothyroxine therapy
- Remember 1.7 mcg / kg is a full weight based dose
  - Patients may require less than this as they are not overtly hypothyroid (TSH > 10.0 uIU/mL)
- Cautions:
  - Elderly and cardiac patients
  - Lifetime commitment, cannot stop Levothyroxine after 6-9 months of continuous therapy