

Clinical Evaluation and Diagnosis of Prevalent Thyroid Disorders in Primary Care: A Comprehensive Case Series

Basem Abbas Ahmed Al Ubaidi¹

¹ Consultant Family Physician, Bahrain

Correspondence: Basem Al Ubaidi, Consultant Family Physician, Manama, Bahrain. Tel: 973-33-190-390. E-mail: Alubaidibasem@gmail.com

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Abstract

Thyroid disorders are prevalent in primary care settings, encompassing a wide spectrum of disorders such as hypothyroidism, hyperthyroidism, and thyroid nodules. Early and accurate diagnosis is crucial for effective management and improved patient outcomes. This case series provides an overview of the key diagnostic approaches for common thyroid diseases in primary care.

The diagnosis of common thyroid diseases in primary care relies on a combination of clinical assessment, laboratory tests, imaging studies, and, if necessary, biopsy. Early and accurate diagnosis is essential for guiding appropriate treatment strategies and optimizing patient well-being. Primary care physicians play a vital role in identifying and managing thyroid disorders, ensuring that patients receive timely and effective care.

Keywords: Clinical evaluation, comprehensive assessment, thyroid disorders, primary care

1. Introduction

Thyroid disorders affect individuals of all ages, genders, and socioeconomic backgrounds worldwide. Developed countries usually diagnose thyroid disorders early due to better healthcare access, while developing countries face challenges in diagnosis and treatment. Hypothyroidism is more prevalent in developed countries, while hyperthyroidism is more common in developing countries. In the Middle East, iodine deficiency contributes to high hypothyroidism rates, while autoimmune thyroid diseases are becoming more prevalent due to lifestyle changes. Untreated or inadequately treated thyroid disorders can lead to various health complications and economic burdens. (Al Zabbi, 2020)

Thyroid disorders require a comprehensive patient history and examination by physicians in primary care to guide the ordering of diagnostic tests. Patients may present with a range of symptoms, including changes in weight, appetite, and energy levels, as well as eye and skin changes. Physical examination should include assessments of cardiac function, eye and skin texture. Also exam the thyroid gland for its size, consistency, tenderness, and presence of nodular lesion, along with laboratory tests for thyroid function (TFT) and autoantibodies. Differential diagnosis of thyroid disorders requires evaluation of tumor markers and imaging studies (Laurberg, 2011; Soh, 2019).

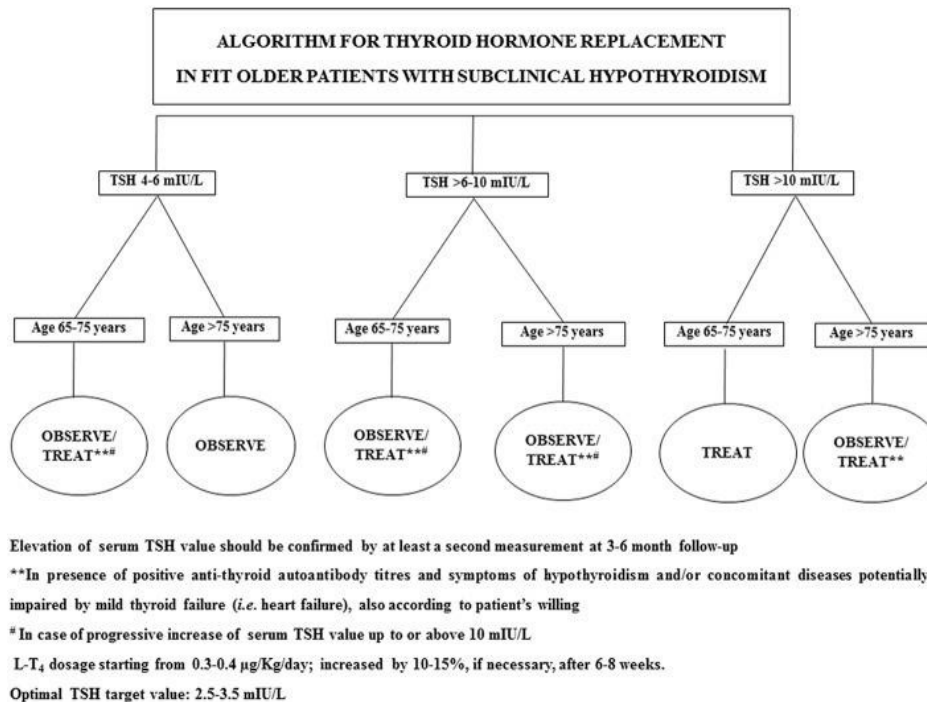
Case 1:

A 68-year-old female patient with a medical history of well-controlled diabetes mellitus (DM), hypertension (HTN), and hyperlipidemia presented to the health center to check her TFT showing thyroid stimulating hormone (TSH) levels of 7 mIU/L. while free triiodothyronine (FT3) and thyroxine (FT4) levels fall within the normal range. Notably, the patient did not exhibit any clinical manifestations of hypothyroidism.

1.1 Would you provide guidance on the appropriate diagnostic and therapeutic management for subclinical hypothyroidism in elderly patients?

In the evaluation of elderly patients with subclinical hypothyroidism, the recommended diagnostic workup involves several key steps. These include repeating the TSH test, assessing for the presence of thyroid antibodies, and conducting a comprehensive evaluation of the patient's medical history, frailty, comorbid conditions, and polypharmacy (Calsolaro, 2019).

When considering treatment, it is advisable to focus on patients between the ages of 65 and 75 who exhibit symptomatic progression with a TSH elevation to ≥ 10 m IU/L, have positive thyroid antibodies, or are dealing with concomitant heart failure in elderly age group. In such cases, the recommended approach is to initiate the use of the lowest effective dose of levothyroxine treatment, typically falling within the range of 0.3-0.4 micrograms per kilogram per day. The desired therapeutic goal is to achieve a target TSH level in the range of 2.5-3.5 m IU/L, and this can be accomplished using specified Algorithm 1.



Algorithm 1. Thyroid hormone replacement in fit older patients with subclinical hypothyroidism

Case 2

A 53-year-old female housewife presented with a history of progressive weight gain, memory loss, fatigue, constipation, and she had slow monotonous speech with a deepened voice. She was diagnosed with ventricular dysrhythmia and treated with amiodarone for the last three years. The patient was presented with stable vital signs, a body weight of 90 kilograms, and exhibited clinical signs consistent with moderate obesity, characterized by the presence of adipose tissue accumulation. Additionally, the individual displayed facial edema and a pallid cutaneous complexion. Further evaluation and assessment are warranted to ascertain potential underlying etiologies and to determine an appropriate course of management. The thyroid gland was not palpable, and ankle reflex time was delayed. Laboratory investigations revealed normal CBC results, a FT4 concentration of 2.8 ug/dl (N=4.5-12.5), a serum TSH level of 0.1 uU/ml (N=0.2-3.5), and a serum cholesterol level of 255 mg/dl (N<200).

2.1 What Is the Diagnosis, and What Approach Would You Take in Managing This Case?

The patient's clinical presentation, laboratory findings, and medication history collectively point toward a diagnosis of secondary or tertiary hypothyroidism, with a particular focus on amiodarone-induced hypothyroidism. Amiodarone, a commonly prescribed medication for the management of ventricular dysrhythmias, is known for its pronounced affinity for lipid-rich tissues, including the thyroid gland. This affinity can result in thyroid dysfunction.

In light of this diagnosis, it is advisable to refer the patient to a cardiology specialist for consideration of alternative treatment options. Specifically, the consideration of switching to medications like dronedarone, which exhibit lower affinity for fat-rich tissues and a reduced likelihood of adverse effects on TFT, is warranted. (Narayana, 2011)

Case 3

A 28-year-old female patient presents with a documented history of pre-existing hypothyroidism and is currently planning for pregnancy. Notably, she has no prior medical records indicating thyroid surgical interventions, thyroid malignancies, or exposure to radioactive iodine therapies. Prior to conception, the patient's TSH level was measured at 5 mIU/L, and she was on levothyroxine 25 Mg/ daily.

3.1 What Pre-Conception Advice Would You Recommend for Her Who is Planning for Pregnancy?

Preconception counseling plays a pivotal role in the prevention of adverse pregnancy outcomes associated with thyroid dysfunction. The elevated prevalence of thyroid disease within women of reproductive age, coupled with the heightened risk of unfavorable pregnancy outcomes linked to thyroid dysfunction, underscores the imperative need for well-established screening and therapeutic protocols during the preconception phase.

For women with a known diagnosis of hypothyroidism, it is imperative to provide counsel on adjusting their levothyroxine dosage by increasing daily 20-30% in cases of suspected or confirmed pregnancy, which may be indicated by a missed menstrual cycle or a positive pregnancy test. Notably, managing subclinical hypothyroidism proves to be advantageous, particularly in the presence of autoimmune conditions or in patients undergoing assisted reproductive techniques.

Following the adjustment of levothyroxine treatment to a daily dose of 50 micrograms, the patient's TSH levels were maintained at 2.5 mIU/L, aligning her with the suitability for adjusting levothyroxine dosage in pregnancy as dictated by prevailing medical Kaplan guideline (Table 1). (Sullivan, 2019)

3.2 What is the Appropriate Method for Adjusting Thyroxine Dosage in Pregnant Women with Hypothyroidism?

The recommended approach for adjusting levothyroxine dosage during pregnancy involves measuring the TSH level one month after conception and ensuring that it is within the acceptable range (≤ 2.5 mIU/L). Subsequent TSH measurements should be taken in each trimester and after delivery to further adjust the levothyroxine dosage as needed (Table 1). It is important to note that all laboratory tests should be conducted at least 6 hours after taking levothyroxine medication, and a minimum of 5 cc of blood is required for testing purposes (Sullivan, 2019).

Table 1. Kaplan guidelines for thyroxine adjustment during pregnancy

TSH level(mIU/L)	Alterations in Levothyroxine Dosage
TSH ≤ 2.5	Same dose
2.5 < TSH ≤ 5	↑ 25 μ g to the previous dose
5 < TSH ≤ 10	↑ 50 μ g to the previous dose
10 < TSH ≤ 20	↑ 75 μ g to the previous dose
TSH > 20	↑ 100 μ g to the previous dose

In most cases of well-controlled hypothyroidism during pregnancy, an increase in a levothyroxine dosage is necessary even in postpartum. The levothyroxine dosage should undergo a 50% augmentation during the initial trimester, followed by iterative 5% incremental adjustments during each subsequent trimester for optimal hypothyroid management during pregnancy. However, due to inter-individual variability, not all pregnant women may require such adjustments, and in some cases, a decrease in a levothyroxine dosage may even be necessary. Therefore, individualized drug adjustments should be made based on laboratory results and clinical improvement scale, whenever feasible (Sullivan, 2019).

Case 4:

A 48-year-old male patient presented at a local health center exhibiting a constellation of symptoms, including fatigue, irritability, neck discomfort, and a recent history of fever. Despite multiple prior visits, he received a diagnosis of an upper respiratory tract infection and was administered supportive care. His symptoms subsequently escalated to encompass tremors, palpitations, sweating, and tachycardia.

Both the patient's personal and familial medical histories were unremarkable, with the exception of his recent resolution of upper respiratory tract infection symptoms approximately 12 days prior. During the clinical examination, the patient displayed tenderness and mild swelling in the neck region, an elevated pulse rate (120 bpm), and peripheral tremors.

The TFT unveiled aberrant results, including slight elevated FT3 levels at 3.55 nmol/L (normal range: 1.20–3.10), heightened T4 levels at 230 nmol/L (normal range: 60–181 nmol/L), and a reduced TSH level at 0.011 mIU/L (normal range: 0.27–4.20 mIU/L). Furthermore, the patient exhibited elevated levels of anti-thyroperoxidase antibodies at 14.2 U/ml (normal range: <9 U/ml), increased anti-thyroglobulin antibody levels at 28 U/ml (normal range: <18 U/ml), While he had normal TSH receptor antibody levels at level 1.30 IU/L (normal range: <1.75 IU/L).

4.1 Would You Provide a Diagnosis Based on the Clinical Presentation and Laboratory Investigation

It is a case of subacute granulomatous thyroiditis (subacute painful or de-Quervain thyroiditis) with the feature of transient hyperthyroidism.

4.2 How Would You Approach the Management of This Patient Based on the Diagnosis and Other Clinical Factors?

The patient should be reassured about the self-limiting nature of post-viral subacute thyroiditis. It is characterized by a three-phase clinical course involving hyperthyroidism, hypothyroidism, and eventual restoration of normal TFTs. Treatment should consist of beta-blockers, short-course corticosteroids, and analgesia. Frequent monitoring through follow-up appointments, ideally every two weeks, is essential until both clinical symptoms and TFT return to baseline levels. Symptoms related to post-viral subacute thyroiditis may endure for a duration of 1-3 months, with full recovery expected. The normalization of TFT may take anywhere from 12 to 18 months, and there is a 5% probability of developing permanent hypothyroidism (Elawady, 2022).

Case 5:

A 30-year-old male expatriate with pertinent medical history presented with a constellation of symptoms including nervousness, memory impairment, reduced work performance, heat intolerance, agitation, tremors, and a significant weight loss occurring over a span of three months duration. Importantly, there was a positive family history of thyroid disorders.

Upon physical examination, the patient displayed exophthalmos, tremors, thyroid enlargement, and a notably elevated heart rate of 115 beats per minute. Laboratory findings indicated TSH level of 0.020 uU/mL, FT4 level elevated at 20.2 ug/dL (normal range: 5.0-12.0), anti-thyroglobulin antibodies exceeding 3000 IU/mL (with negative defined as <60 IU/mL, equivocal as 60-100 IU/mL, and positive as >100 IU/mL), anti-thyroid peroxidase antibodies measuring 2880 IU/mL (with a normal range of < 60 IU/mL), and anti-TSH receptor antibodies registering at 70% inhibition (normal range \leq 16.0 Unit).

5.1 Based on the Clinical and Laboratory Investigations, What is the Diagnosis for the Condition?

The clinical and laboratory diagnosis was Graves' disease (hyperthyroidism, thyrotoxicosis) (Table 2).

5.2 What is the Management Plan for This Patient Based on Their Diagnosis and Clinical Presentation?

Prior to the onset of the antithyroid drug's therapeutic effect, symptomatic treatment is often necessary. Beta-blockers serve as a valuable option for symptom control. Various beta-blockers demonstrate comparable effectiveness in alleviating the adrenergic manifestations of thyrotoxicosis, including palpitations, tachycardia, tremors, anxiety, and heat intolerance. In situations where beta-blockers are either poorly tolerated or contraindicated (e.g., in cases of asthma), a nondihydropyridine calcium channel blocker can be employed to regulate heart rate.

Thionamide antithyroid drugs, namely carbimazole and propylthiouracil, operate by inhibiting thyroid peroxidase, thereby diminishing the synthesis of thyroid hormones. Carbimazole is the primary choice among thionamides for most patients, as it facilitates a swifter normalization of thyroid hormone levels, exhibits reduced hepatotoxicity, and allows for once-daily dosing due to its extended half-life. Propylthiouracil, on the other hand, is the preferred antithyroid drug during the first trimester of pregnancy, for managing thyroid storm (owing to its additional inhibition of the conversion of T4 to T3), and in cases where minor adverse reactions to carbimazole occur, particularly when radioactive iodine or surgical interventions are not deemed suitable.

The initial dosage of carbimazole was established at 0.75 mg per kilogram per day, equivalent to a total of 45 mg per day, with the option for escalation to 1 mg per kilogram per day as necessary to achieve the normalization of T4 levels. Furthermore, it is advisable for the patient to incorporate a low-dose thyroxine supplementation at a rate of 75 μ g per square meter during the initial four months of treatment (Wood, 2022).

Table 2. LFT and radioiodine uptake in thyroid dysfunction

Physiologic state	Serum TSH	Serum Free T4	Serum T3	24-h radioiodine uptake
Hyperthyroidism, Untreated	Low	High	High	High
Hyperthyroidism, T3 toxicosis	Low	Normal	High	Normal or High
Primary Hypothyroidism, untreated	High	Low	Low or Normal	Low or Normal
Hypothyroidism Secondary to Pituitary disease	Low or Normal	Low	Low or Normal	Low or Normal
Euthyroid, on exogenous Thyroid hormone	Normal	Normal on T4, Low on T3	High on T3, Normal on T4	Low

Case 6:

A 28-year-old physically active female patient received a diagnosis of a benign thyroid nodule approximately four years ago. However, over time, she began experiencing pressure symptoms, particularly while swallowing solid foods, as the right-sided thyroid nodule rapidly expanded. The patient had no previous history of radiation exposure, and her personal and family medical history was unremarkable.

Upon physical examination, a warm and solid right thyroid nodule measuring three centimeters in diameter was identified. Her TFT fell within the normal range. Nevertheless, a thyroid ultrasound revealed a three-centimeter hypoechoic solid mass, raising a high suspicion of malignancy. Fine-needle aspiration (FNA) confirmed the diagnosis of papillary carcinoma.

In response, the patient underwent an extensive surgical procedure involving radical right neck surgery and total thyroidectomy. Pathological examination confirmed the presence of non-metastatic papillary carcinoma in the left lobe of the thyroid gland, along with metastatic lesions in the right lobe. Fortunately, no distant metastases were observed. Following the surgical intervention, the patient was placed on a lifelong regimen of levothyroxine at a daily dose of 100 mg.

6.1 What Is the Prevalence of Incidental Thyroid Nodules on Thyroid Ultrasound Expressed as a Percentage?

Incidental thyroid nodules, often discovered through thyroid ultrasound, are found at a notable prevalence, reaching as high as 68% in individuals without known thyroid issues. This occurrence is more frequently observed in aging females with obesity. Importantly, the vast majority, around 90% to 95% of such cases, are benign in nature (Kant in 2020).

6.2 What Are the Factors that Increase the Risk of a Thyroid Nodule Being Malignant?

Risk factors that elevate the likelihood of malignant thyroid nodules encompass exposure to ionizing radiation, the abrupt and significant enlargement of nodules, the onset of hoarseness, positive family history of thyroid cancer and the presence of familial adenomatous colon polyposis. A small fraction of benign thyroid nodules, approximately 2%, possess the potential for malignancy. Further molecular testing of these nodules can offer valuable insights into the underlying mechanisms responsible for the early progression to malignancy. (Kant, 2020).

Case 7:

A 30-year-old unmarried female with an unremarkable medical history sought TFT due to her mother's history of hypothyroidism. She reported experiencing hair loss and had been taking biotin supplements for four months, which had resulted in an improvement in her hair condition. Physical examination did not reveal any abnormalities, and her additional laboratory tests, including both liver, renal function test and complete blood test, were all within normal ranges.

Her TFT showed TSH level of 0.01 μ IU/mL, falling below the established reference range of 0.4-4.6 mIU/L. The FT4 level was elevated at 26 pmol/L, surpassing the reference range threshold of 10-19 pmol/L, while the FT3 level measured 8 pmol/L, also exceeding the reference range of 3.5-6.5 pmol/L. Further inquiry into the patient's history revealed no iodine exposure, recent fever, medication use, or symptoms indicative of thyrotoxicosis.

7.1 What Is the Medical Explanation for the Abnormal Thyroid Function Tests in This Patient?

Biotin (B7) is frequently used by patients for improving the health of their nails and hair, aiding in weight loss, and boosting energy. However, biotin is a water-soluble vitamin that interferes with TFTs, causing falsely elevated

or decreased levels of TSH, FT4, and presence of TSH receptor antibodies. This interference may lead to a misleading interpretation of the biochemical pattern of Graves' disease, characterized by low TSH, increased FT4, and positive antibodies to the TSH receptor, despite the absence of symptoms or signs of thyroid dysfunction (Zhang, 2020).

7.2 What Would be the Most Appropriate Course of Action to Take in This Patient's Case?

The recommended course of action is to advise the patient to discontinue biotin supplements for at least 14 days and to repeat the TFTs. It is crucial to carefully review all medications and supplements the patient is taking and consider their clinical presentation (Zhang, 2020).

Case 8:

A 50-year-old female patient with a history of primary autoimmune hypothyroidism who has struggled with adherence to her prescribed daily levothyroxine regimen (100 mcg), the physician initiate a focused and compassionate dialogue to address her problem to the prescribed therapeutic protocol.

8.1 What Is the Recommended Management Approach for This Case?

A weekly regimen of levothyroxine administered as a single dose is a secure and efficacious approach, presenting a viable option for patients who exhibit non-adherence. Consequently, her attending physician initiated a once-weekly, high-dose levothyroxine therapy at 700 mcg. At a subsequent follow-up appointment which was conducted two months later, the patient reported sustained absence of symptoms related to heat intolerance, irritability, nervousness, or undue perspiration. Laboratory findings revealed TSH concentration of 0.8 mIU/L and FT4 level of 2.47 ng/dL. These results signify stable thyroid function and suggest an adequate response to the ongoing therapeutic intervention.

Weekly levothyroxine treatment protocol yields a relatively diminished degree of TSH suppression, with the mean TSH level consistently falling within the confines of the normal reference range. These observations imply that this therapeutic approach may warrant consideration as a viable alternative for a specific subset of noncompliance patients (Chiu 2022). Furthermore, it is imperative to emphasize patient education, undertake a meticulous review of the medication regimen, streamline the treatment plan, foster shared decision-making with the patient, and schedule regular follow-up consultations for the purpose of ongoing monitoring and discourse pertaining to any encountered challenges or treatment-related side effects. Additionally, the promotion of adherence through the utilization of reminder tools and an exploration of the patient's social support system should be integral components of the comprehensive care plan.

Case 9:

A 35-year-old pregnant woman, currently at 10 weeks of gestational age, was asymptomatic and had a history of 5 pregnancies (gravida) with 4 live births (para) and no history of pregnancy loss (abortions). Her comprehensive laboratory investigation, which included a complete blood count, renal function, liver function tests, and a lipid profile, yielded normal results. However, her TFTs displayed low TSH level at 0.05 mIU/L, elevated FT4 levels at 20 µg/dL, and T3 levels at 6 ng/dL. Furthermore, her thyroid antibody levels were within normal limits.

Despite an unremarkable medical history and physical examination, the patient consistently maintained a state of euthyroid, exhibiting no signs or symptoms of thyroid dysfunction. This was confirmed by repeated thyroid function tests, which showed consistent results after one week, reinforcing her euthyroid status.

9.1 What Is Your Understanding of Atypical Thyroid Function Test Results?

In the case of this patient during her first trimester of pregnancy, her TFT indicated low serum TSH levels and elevated serum FT4 and FT3 levels, which exceeded the typical levels seen in non-pregnant adults. When assessing TFT during pregnancy, it is critical to apply trimester-specific reference ranges for serum TSH and FT4 levels.

It is important to note that trimester-specific reference ranges for serum TSH in pregnant Arab women may differ from the reference ranges recommended for non-pregnant adults, with the former typically showing higher values. Therefore, it is crucial to exercise caution when interpreting TFT results in pregnant women and to avoid common errors in the interpretation of TFT in individuals at different stages of pregnancy (Table 3) (Khalil, 2018)

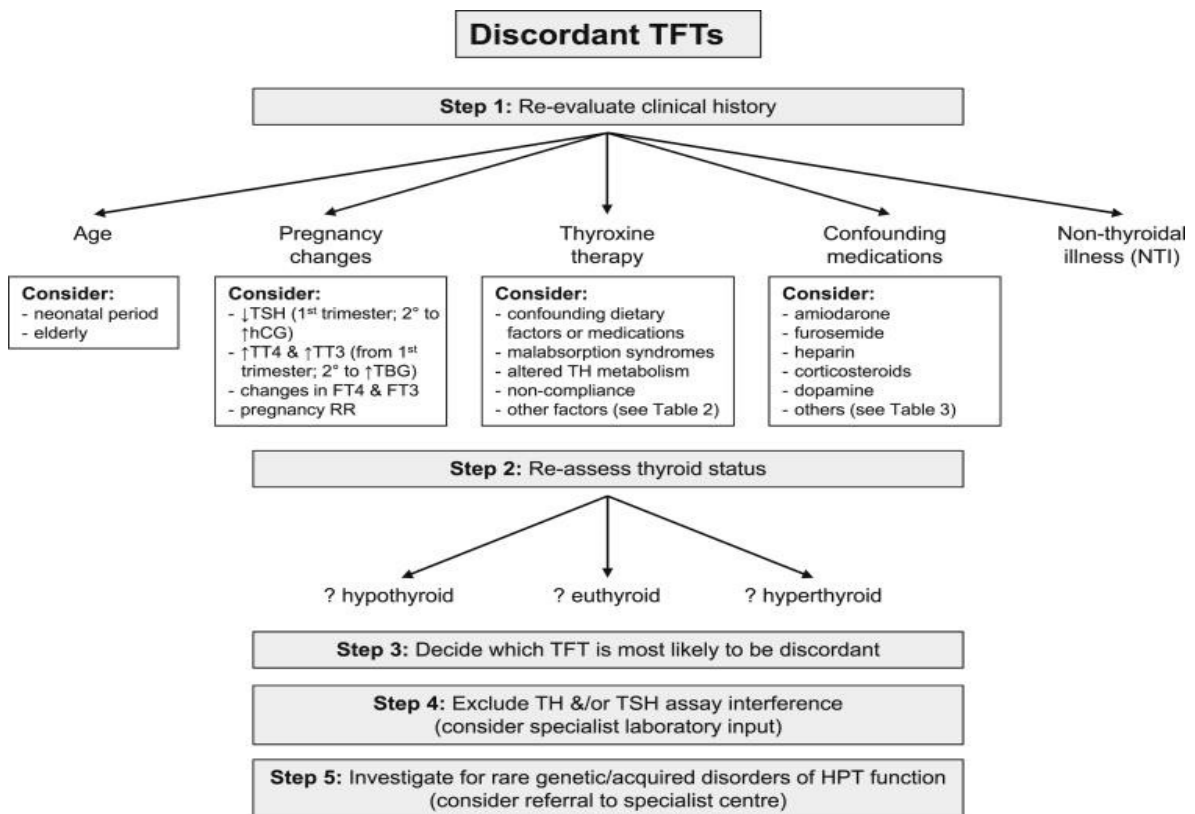
Table 3. Trimester-specific reference ranges for serum TSH and FT4

Trimester-Specific Reference Intervals for Thyroid Function Tests:	
1st Trimester:	
• FT4 (pmol/L) Reference Range:	11.73 – 20.39
• TSH (mIU/L) Reference Range:	0.094 – 3.33
2nd Trimester:	
• FT4 (pmol/L) Reference Range:	9.25 – 17.22
• TSH (mIU/L) Reference Range:	0.052 – 4.56
3rd Trimester:	
• FT4 (pmol/L) Reference Range:	8.71 – 15.26
• TSH (mIU/L) Reference Range:	0.44 – 4.75

9.2 What Is Meant by Discordance in the Interpretation of TFTs?

Numerous factors can introduce discrepancies or challenges in the interpretation of TFTs, as delineated in algorithm two, (Koulouri 2013). These factors encompass:

- Age-related variations, particularly in neonates and elderly individuals.
- The influence of pregnancy, particularly during different trimesters.
- The administration of thyroxine therapy or the existence of malabsorption disorders.
- The usage of medications known to potentially interfere with TFT results, such as Amiodarone or Lithium.
- The presence of non-thyroidal illness (NTI) in severely ill hospitalized patients, alongside psychiatric conditions, substance misuse, or the usage of specific psychiatric medications.



Algorithm 2. Discordant TFT interpretation

Case 10:

A 29-year-old female presented for a routine check-up without any noticeable symptoms. She had a positive family history of hypothyroidism in her mother and grandmother. The physical examination did not reveal any palpable thyroid enlargement, and her Body Mass Index (BMI) and blood pressure were within the normal range.

Laboratory investigations revealed positive thyroid peroxidase antibodies (TPOAb) with a value of 37.1 IU/mL (normal range, <28 IU/mL) and negative thyroglobulin antibodies (TgAb) with a value of 1 IU/mL (normal range, <100 IU/mL). Her lipid profile showed elevated cholesterol levels of 6.7 mmol/L (normal range, 3.6-5.2 mmol/L) and triglyceride levels of 1.9 mmol/L (normal range, 0.2-1.8 mmol/L). Notably, her TSH level was within the normal range, with a value of 1.53 mIU/L (normal range, 0.25-5.0 mIU/L).

10.1 What Is the Significance of Thyroid Antibodies?

The levels of thyroid antibodies, particularly thyroid peroxidase antibodies (TPOAb) and thyroglobulin antibodies (TgAb), can be indicative of various thyroid disorders such as Graves' disease, Hashimoto's disease, and thyroid cancer. Specifically, TPOAb levels are known to increase in these disorders, while thyrotropin receptor antibodies (TSHRAb) tend to increase only in Graves' disease. In the case of Hashimoto's disease, elevated levels of TgAb are often observed. These associations are further illustrated in Table 4 (Soh, 2019).

Table 4. Thyroid Antibodies

Autoantibody	Abbreviation	Causes
Thyroid peroxidase antibody	TPOAb	Hashimoto's disease, Grave's disease, and thyroid cancer
Thyroid-stimulating hormone receptor antibody	TSHR-Ab	Strongly linked to Graves' disease
Thyroglobulin antibody	TgAb	More suggestive of Hashimoto's disease

10.2 How Should the Patient's Laboratory Investigations be Interpreted?

The patient investigation profile was characterized by a slight elevation in thyroid peroxidase antibodies (TPOAb). However, her TFT, inclusive of TSH and FT4, revealed values that fell within the recognized normal range, thus rendering therapeutic intervention unnecessary. Furthermore, the patient was diagnosed with hyperlipidemia. It should be noted that the potential association of hyperlipidemia with autoimmune thyroid antibodies remains a subject of ongoing debate in contemporary research (Srivastava 2017).

10.3 Is There a Potential Correlation between Dietary Intake and TPOAb Levels?

Research has revealed a correlation between the consumption of animal fats and butter and the presence of positive plasma thyroid peroxidase antibodies (TPOAb) and/or thyroglobulin antibodies (TgAb). Conversely, a diet rich in vegetables, dried fruit, nuts, and muesli has been associated with negative findings of TgAb and/or TPOAb. Additionally, dietary patterns that exhibit anti-inflammatory properties have been linked to negative findings of plasma TgAb and/or TPOAb (Matana, 2017).

10.4 What is your Approach If the Patient Had High TSH between 5-10 (Subclinical), with Positive Antithyroid Antibodies of High TPOAb, TgAb?

The initiation of levothyroxine therapy is indicated in the following scenarios:

- When the TSH level exceeds 10 mIU/l.
- In the presence of symptomatic hypothyroidism.
- When cardiovascular risk factors are evident.
- In the presence of positive Thyroid Peroxidase (TPO) antibodies.

The primary objective of levothyroxine therapy is to achieve the normalization of both antithyroid antibodies and TSH levels. The initial levothyroxine dose is recommended at 1.6 mcg/kg, contingent upon the presence or absence of concomitant cardiovascular disease (Gosi, 2021).

In summary, this extensive case series is dedicated to the clinical assessment and diagnosis of common thyroid disorders within the realm of primary care. By presenting a variety of clinical scenarios, our objective is to augment comprehension and advocate for the implementation of efficacious management approaches. Additionally, we underscore the crucial role played by primary care physicians in delivering high-quality thyroid healthcare.

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The data that support the findings of this study are available on request.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

References

- Al Zaabi, M. J., & Al Menhali, A. A. (2020). *Journal of thyroid research*, 2020. <https://doi.org/10.1155/2020/7065409>
- Calsolaro, V., Niccolai, F., Pasqualetti, G., Calabrese, A. M., Polini, A., Okoye, C., ... & Monzani, F. (2019). Overt and Subclinical Hypothyroidism in the Elderly: When to Treat? *Frontiers in Endocrinology*, 10. <https://doi.org/10.3389/fendo.2019.00177>
- Chiu, H. H., Larrazabal, R., Uy, A. B., & Jimeno, C. (2022). Weekly Versus Daily Levothyroxine Tablet Replacement in Adults with Hypothyroidism: A Meta-Analysis. *Journal of the ASEAN Federation of Endocrine Societies*, 36(2), 156-160. <https://doi.org/10.15605/jafes.036.02.07>
- Elawady, S. S., Phuyal, D., Shah, R. K., & Mirza, L. (2022). A case of subacute thyroiditis following COVID-19 infection. *Case Reports in Endocrinology*, 2022. <https://doi.org/10.1155/2022/2211061>
- Gosi, S. K. Y., & Garla, V. V. (2021). *Subclinical hypothyroidism*. In StatPearls [Internet]. StatPearls Publishing. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK553133/>
- Kant, R., Davis, A., & Verma, V. (2020). Thyroid nodules: advances in evaluation and management. *American Family Physician*, 102(5), 298-304. Retrieved from <https://www.aafp.org/afp/2020/0901/p298.html>
- Khalil, A. B., Salih, B. T., Chinengo, O., Bardies, R. D., Turner, A., & Abdel Wareth, L. O. (2018). Trimester-specific reference ranges for serum TSH and Free T4 among United Arab Emirates pregnant women. *Practical Laboratory Medicine*, 12, e00098. <https://doi.org/10.1016/j.plabm.2018.e00098>
- Koulouri, O., Moran, C., Halsall, D., Chatterjee, K., & Gurnell, M. (2013). Pitfalls in the measurement and interpretation of thyroid function tests. *Best Practice & Research. Clinical Endocrinology & Metabolism*, 27(6), 745-762. <https://doi.org/10.1016/j.beem.2013.10.003>
- Laurberg, Peter, and Inge Bülow Pedersen. (2011). Clinical assessment of the thyroid patient. In John A.H. Wass and others (eds.), *Oxford Textbook of Endocrinology and Diabetes* (2nd ed.). Oxford Textbooks. Oxford Academic. <https://doi.org/10.1093/med/9780199235292.003.3026>
- Matana, A., Torlak, V., Brdar, D., Popović, M., Lozić, B., Barbalčić, M., ... & Zemunik, T. (2017). Dietary Factors Associated with Plasma Thyroid Peroxidase and Thyroglobulin Antibodies. *Nutrients*, 9(11). <https://doi.org/10.3390/nu9111186>
- Narayana, S. K., Woods, D. R., & Boos, C. J. (2011). Management of Amiodarone-Related Thyroid Problems. *Therapeutic Advances in Endocrinology and Metabolism*, 2(3), 115-126. <https://doi.org/10.1177/2042018811398516>
- Soh, S. B., & Aw, T. C. (2019). Laboratory Testing in Thyroid Conditions: Pitfalls and Clinical Utility. *Annals of Laboratory Medicine*, 39(1), 3-14. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6595864/>
- Srivastava, V. K., & Singh, H. (2017). Association of thyroid peroxidase antibody and dyslipidemia in subclinical hypothyroidism. *Journal of family medicine and primary care*, 6(1), 63. <https://doi.org/10.4103/2249-4863.214958>
- Sullivan, S. A. (2019). Hypothyroidism in pregnancy. *Clinical Obstetrics and Gynecology*, 62(2), 308-319. <https://doi.org/10.1097/GRF.0000000000000432>
- Wood, C. L., Morrison, N., Cole, M., Donaldson, M., Dunger, D. B., Wood, R., Pearce, S. H. S., & Cheetham, T.

D. (2022). Initial response of young people with thyrotoxicosis to block and replace or dose titration ethionamide. *European Thyroid Journal*, 11(1), e210043. <https://doi.org/10.1530/ETJ-21-0043>

Zhang, Y., Wang, R., Dong, Y., Huang, G., Ji, B., & Wang, Q. (2020). Assessment of biotin interference in thyroid function tests. *Medicine*, 99(9). <https://doi.org/10.1097/MD.0000000000018647>

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