

Management of hypothyroidism in general practice- A review of guidelines

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ABSTRACT

Introduction: Hypothyroidism is a common complex chronic disease and levothyroxine is considered as a standard of care in the treatment of hypothyroidism. Untreated hypothyroidism leads to devastating complications. Careful and titrated management is necessary to have optimal functioning of thyroid glands to control overall metabolism. **Diagnosis:** Routine evaluation with Thyroid Function Test (TFT) is recommended to diagnose Hypothyroidism, Thyroid Peroxidase (TPO) Antibody testing is done to identify autoimmune etiology and the routine need of ultrasound is determined by findings in clinical examination. **Treatment:** Levothyroxine is standard of treatment for hypothyroidism. Regular follow up with Thyroid Stimulating Hormone (TSH) and titrated dose of levothyroxine is recommended.

Keywords: general practice, hypothyroidism, treatment protocol

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INTRODUCTION

Secretion of TSH (Thyroid Stimulating Hormone) from the pituitary gland stimulates secretion of two principal hormones-triiodothyronine (T3) and Levothyroxine (T4), with T4 accounting 80% of total. Hypothyroidism is a state of deficiency of thyroid hormones T3 and T4, diagnosed mainly according to the circulating level of Thyroid Stimulating Hormone (TSH).¹The levels of T3 and T4 in the circulation feedback to circuits in the hypothalamus that regulate the secretion and activity of thyrotropin releasing hormone, which in turn influences the secretion of TSH. The overall effect of thyroid in the body is determined by the feedback loops and activity of deiodinases within the target tissues.²

A level of serum TSH above an assay-specific reference range of TSH levels (typically around 0.4–4 mIU/L) determined in a population believed to be free of thyroid dysfunction is indicative of the presence of hypothyroidism. “Subclinical hypothyroidism” refers to a state where serum

TSH is elevated but thyroid hormone levels are normal.³

Hypothyroidism in general practice is commonly encountered problem. There is no existing national hypothyroidism guideline in Nepal. This protocol is generated by collecting evidence from latest articles to provide standard approach and to bridge the gap to manage cases of hypothyroidism.

Diagnosis

The normal range of TSH is 0.4 to 4.5 mIU/L. Free T4 level is to distinguish clinical (low FT4) from subclinical (normal FT4) hypothyroidism. Routine evaluation of total T3, total T4, FT3 levels is not recommended.⁵ Positive thyroid peroxidase (TPO) antibody suggests an autoimmune etiology but does not help diagnose hypothyroidism and thyroid ultrasonography is only used when there is palpable thyroid nodules in clinical examination and is not a part of routine evaluation.^{6,7}

Table 1. Clinical spectrum of hypothyroidism⁴

Symptoms of hypothyroidism	Signs of hypothyroidism
Fatigue, cold intolerance, constipation, depression, dry skin, hair changes, lethargy, memory impairment, muscle cramps, myalgia, voice changes, weakness, menorrhagia, difficulty concentrating.	Bradycardia, coarse facies, diastolic hypertension, edema, goiter, hoarseness, hypothermia, weight gain, delayed relaxation of deep tendon reflexes, pallor.

Table 2. Management protocol Compiled from standard guidelines.^{1,7,8,9}

Conditions	Guideline
Having signs and symptoms of hypothyroidism	Measure TSH
	-TSH<0.4mIU/L- consider hyperthyroid state
	-TSH within normal range- Euthyroid
	-TSH>4.5mIU/L: measure FT4 - FT4 below normal range- primary hypothyroidism -FT4 within normal range- subclinical hypothyroidism -FT4 above normal range- consult endocrinologist
Primary hypothyroidism (In absence of cardiovascular disease)	Age <60 years: Start Levothyroxine 1.6 mcg/kg/day- retest TSH in 6-8 weeks -TSH <0.4mIU/L- over treated- decrease daily dosage by 12.5-50 mcg -TSH- normal range- annual check-up of TSH -TSH>4.5 mIU/L- increase daily dosage by 12.5-25 mcg Age >60 years: Start Levothyroxine 12.5 to 50 mcg/day- increase dosage by 25 mcg every 3-4 weeks until TSH is in normal range
Subclinical hypothyroidism	Test TPO antibody, re-test TSH after 6-12 months. Treat if TSH>10 mIU/L and TPO antibody positive with levothyroxine 1.6 mcg/kg/day.
Hypothyroidism in pregnancy	-Thyroid function test is recommended in first trimester/preconception phase among women with risk of overt thyroid disorders. -Start levothyroxine at 1.6mcg/kg/day in pregnant with overt hypothyroidism and severe subclinical hypothyroidism (TSH>10 mIU/L and TPO antibody positive). -Start levothyroxine at 1-1.2mcg/kg/day for newly diagnosed hypothyroidism, subclinical with TSH above upper limit and 10mIU/L. -Re-test TSH and FT4 every 4-6 weeks until 20 weeks and then once again at 28 weeks of gestation. Aim to keep TSH below 2.5mIU/L (First trimester), 3mIU/L (second trimester) and 3.5mIU/L (third trimester) while keeping FT4 within normal range.
Referral to endocrinologist	Age <18 years, myxedema come, pregnancy, simultaneous presence of another endocrinopathy, structural changes in thyroid gland (example- goiter, nodule), symptoms not improved with levothyroxine, existing heart disease.

Management

Levothyroxine is the standard of treatment in clinical hypothyroidism to normalize TSH levels and relieve symptoms.¹ Levothyroxine is taken once per day 30-60 minutes before food and 4 hours before or after drugs that may impede absorption (Proton Pump Inhibitors, Iron, antacids, sucralfate, orlistat, calcium carbonate, bile acids sequestrants).⁸ The cut off for a raised TSH at which treatment has been recommended is at ≥ 10 mIU/l on two separate occasions three months apart.⁹

CONCLUSION

The treatment goals for hypothyroidism are to reverse clinical progression as evidenced by TSH and free T4 levels. Hypothyroidism can be adequately treated with a constant daily dose of levothyroxine.

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