

Hypothyroidism

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Introduction

- ▶ Hypothyroidism is the most common disease in our country and is caused by suboptimal circulating concentrations of thyroid hormones.
- ▶ It becomes more prevalent with age, affecting about 6 per cent of people over 60 years, and is more common in women.
- ▶ The condition may develop insidiously and in its early stages may cause only vague symptoms.

Symptoms of hypothyroidism

- ▶ There is a generalized slowing down of metabolism, with lethargy, bradycardia, depression and weakness.
- ▶ If the hormone deficiency is caused by a primary disorder of the thyroid gland, the patient may present with weight gain, myopathy, menstrual disturbances, such as menorrhagia, and constipation.
- ▶ The skin may be dry, the hair may fall out and the voice may be hoarse.
- ▶ In severe cases, coma with profound hypothermia may develop.

Figure 1: Hypothyroidism women with depression

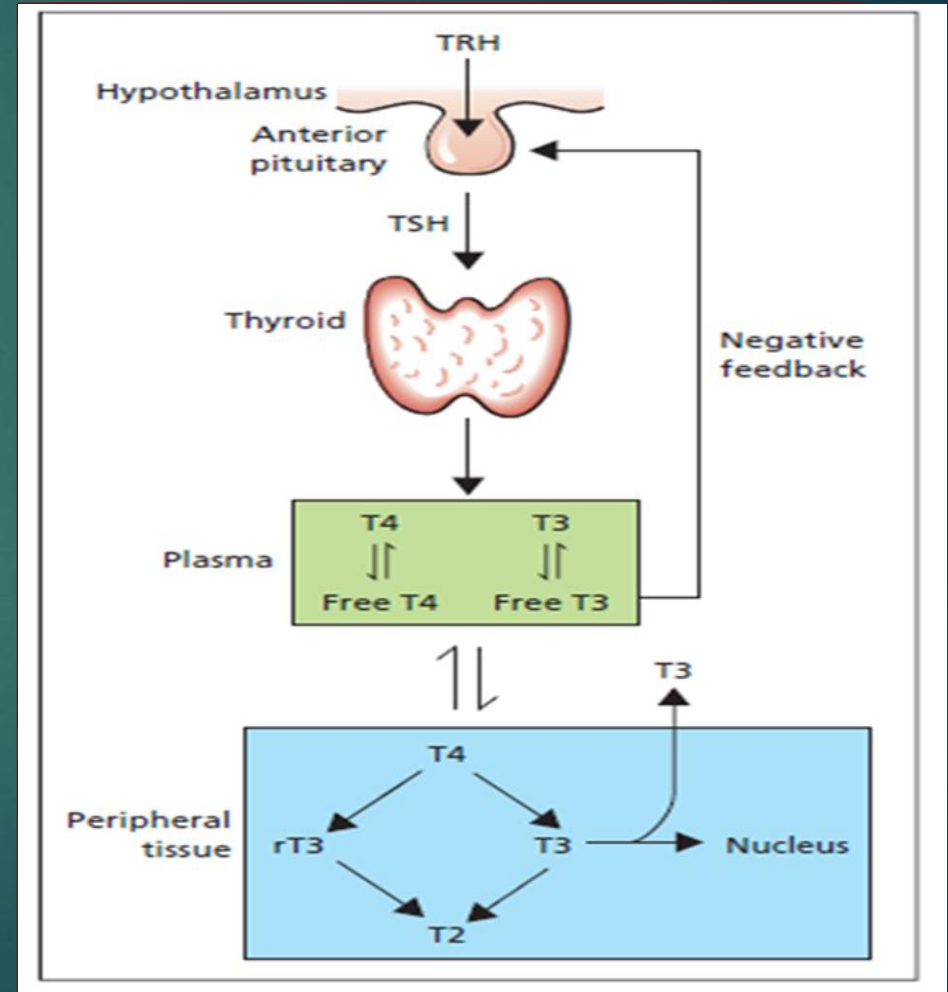


Pathophysiology:

- ▶ As primary hypothyroidism develops, TSH secretion from the anterior pituitary gland increases as the negative feedback (associated with the falling plasma T4 or fT4 concentration) decreases.
- ▶ Plasma T3 or fT3 concentrations may be normal and thus not usually useful in making the diagnosis.
- ▶ Generally, in primary hypothyroidism the plasma TSH concentration is high, but it is low in secondary hypothyroidism due to pituitary or hypothalamic disease.
- ▶ Initially, the plasma T4 or fT4 concentration may be within the population reference range, although abnormally low for the individual. For this reason, the plasma TSH concentration is the most sensitive index of early hypothyroidism. If the patient is very ill, investigations should be deferred.

Figure 2: Hypothalamic–pituitary–thyroid axis (pathophysiology).

- ▶ Thyrotropin releasing hormone (TRH) stimulates the production and release of thyrotropin (TSH). TSH stimulates the thyroid gland to synthesize and secrete thyroid hormone. T4 that is released by the thyroid gland is mostly converted to T3 by the liver and kidney. T3 and T4 feedback inhibit TSH release directly through action at the pituitary and indirectly by decreasing TRH release from the hypothalamus.



Pregnancy and neonatal hypothyroidism:

- ▶ In about 0.3 per cent of pregnancies the mother has Hashimoto's disease. Thyroid hormones are essential for fetal development, hence the importance of treating the mother with thyroxine.
- ▶ In neonatal hypothyroidism ,The head is broad, the eyes wide apart, the tongue protrudes from the mouth and all movements and responses are slow and sluggish; as seen in figure 3.

Figure 3: Congenital hypothyroidism. The head is broad, the eyes wide apart, the tongue protrudes from the mouth and all movements and responses are slow and sluggish.



What is the causes of Hypothyroidism



Multiple factors may contribute to hypothyroidism, including:

- ▶ Iodine deficiency is the most common causes of hypothyroidism.
- ▶ Hashimoto's thyroiditis: This autoimmune disease is the most common cause of hypothyroidism.
- ▶ Medications: Certain medications, such as lithium, can cause hypothyroidism.
- ▶ Pregnancy: Hypothyroidism can develop during or after pregnancy.
- ▶ Treatment for hyperthyroidism: People who have hyperthyroidism (overactive thyroid) are treated with radioactive iodine therapy, which impairs thyroid function and can cause hypothyroidism.
- ▶ Thyroid surgery: If your thyroid gland is removed, you can't make thyroid hormone, so you'll need to take thyroid hormone replacement.

Diagnosis of Hypothyroidism



Diagnosis

- ▶ A careful history should be taken and an examination performed, checking for a goiter.
- ❖ The plasma TSH and total T4 or fT4 concentrations should be measured.
- ❖ Slightly elevated plasma TSH and normal fT4 concentrations suggest compensated hypothyroidism.
- ❖ Measuring circulating thyroid antibodies may be useful, that is, anti-TPO. Tests should be repeated after 3–6 months as some patients may develop full blown hypothyroidism.
- ❖ Raised plasma TSH and low fT4 concentrations suggest primary hypothyroidism.
- ❖ Low plasma TSH and low fT4 concentrations may indicate that the hypothyroidism is caused by a hypothalamic or pituitary disorder.
- ❖ Raised plasma TSH and raised/normal plasma fT4 concentrations in the presence of hypothyroid symptoms may indicate thyroid hormone resistance.

Thyroid Hormone Replacement Therapy for Hypothyroidism



Treatment of hypothyroidism:

- ▶ This is usually with T4, which can be titrated until the plasma TSH is within the reference range.
- ▶ On rare occasions, such as in hypothyroid comas, T3 is given instead, as its action is more immediate.
- ▶ The response to T4 therapy can be checked every 2–3 months until the patient is stable, after which 6- to 12-month blood checks may be useful.
- ▶ Thyroxine should be used with caution in patients with ischemic heart disease for fear of worsening angina pectoris, and low doses initially plus b-blockers may be indicated.
- ▶ Overtreatment with T4 can evoke atrial fibrillation and osteoporosis; in such cases, plasma TSH concentrations are often low or suppressed.

Subclinical hypothyroidism:

- ▶ Subclinical (compensated hypothyroidism) is the state in which plasma TSH concentration is raised but the total or fT4 concentration still falls within the reference range.
- ▶ In individuals over the age of 60 years, the prevalence may be as high as 10 per cent. Some of these patients have positive thyroid antibodies, for example anti-TPO or anti-Tg, and each year about 2–5 per cent of thyroid antibody-positive patients go on to develop hypothyroidism.
- ▶ Some patients may be asymptomatic, whereas others have symptoms suggestive of hypothyroidism.



Thank you