Thyroid Disease In Pregnancy

It is usual for the thyroid gland to hypertrophy in normal pregnancies. There is also an increase in thyroid-binding globulin and albumin due to increased hepatic synthesis.\(^1\)

**In pregnancy**

- Total T4 and T3 increase.
- Free T4 and T3 remain within normal range.
- Thyroid-stimulating hormone (TSH) does not change.

Overt hyperthyroidism is associated with miscarriage, stillbirth, preterm delivery, intrauterine growth restriction, low birth weight, pre-eclampsia and fetal thyroid dysfunction. Overt hypothyroidism is associated with anaemia, pregnancy-induced hypertension, pre-eclampsia, placental abruption, postpartum haemorrhage, premature birth, low birth weight, intrauterine fetal death, increased neonatal respiratory distress and infant neurodevelopmental dysfunction.\(^2\)

However, the adverse effect of subclinical hypothyroidism and thyroid antibody positivity on pregnancy outcomes remains controversial. Although some studies have shown increased risk of placental abruption, preterm birth, miscarriage, gestational hypertension, fetal distress, severe pre-eclampsia and neonatal distress and diabetes in pregnant women with subclinical hypothyroidism or thyroid autoimmunity, other studies have not reported these adverse effects.\(^2\)

Thyroid peroxidase antibodies (TPAs) are present in 10% of women at 14 weeks of gestation and may be associated with:\(^3, 4\)

- An increased rate of pregnancy failure.
- An increased incidence of gestational thyroid dysfunction.
- A predisposition to postpartum thyroiditis.

The need for screening of all women in early pregnancy, thyroid hormone placental physiology and thyroid hormone gestational reference ranges are areas of research which are currently being investigated.\(^5\)

**Clinical Editor’s Note**

January 2018 - Dr Hayley Willacy draws your attention to the American Thyroid Association’s 2017 Guidelines for managing thyroid disease around pregnancy\(^6\). Among the recommendations is that all pregnant women should ingest approximately 250 micrograms of iodine daily. To achieve this, strategies may need to vary depending on country of origin. In most countries, women who are planning pregnancy or currently pregnant, should supplement their diet with a daily oral supplement that contains 150 micrograms of iodine in the form of potassium iodide. This is optimally started 3 months before conception.

Hypothyroidism

**Epidemiology**

Hypothyroidism (including subclinical hypothyroidism) occurs in 2.5% of pregnant women. However, only 1-3 per 1,000 pregnancies are complicated by overt hypothyroidism.\(^7\)

**Aetiology**

- Autoimmune thyroiditis - eg, Hashimoto’s thyroiditis (also known as Hashimoto’s disease).
- Radiotherapy or surgery.
- Congenital.
- Drugs - eg, lithium, amiodarone.
- Iodine deficiency.
- Infiltrative diseases.
- Pituitary or hypothalamic disease.
**Presentation**

Overt hypothyroidism in pregnancy may present classically but is often subtle and difficult to distinguish from the symptoms of normal pregnancy. A high index of suspicion is therefore required.[8]

- Dry skin with yellowing especially around the eyes.
- Weakness, tiredness, hoarseness, hair loss, intolerance to cold, constipation, sleep disturbance.
- Goitre, delayed relaxation of deep tendon reflexes.
- Anaemia, low T4, raised TSH.
- In the subclinical form TSH is raised but free T4 and T3 are normal. Antibodies to thyroid peroxidase, TSH receptor and/or thyroglobulin are positive. It is important to appreciate that TSH ranges in pregnancy differ from those in non-pregnant women and vary from trimester to trimester. Guidance from the local laboratory/thyroid specialist should be sought as to the normal range.[9]

**Management**[7]

- Thyroxine at increasing dosages until TSH is brought to a normal-low range. The starting dose is usually 0.10-0.15 mg/day and should be adjusted according to TSH levels every four weeks.
- Hypothyroidism in pregnancy is treated with a larger dose of thyroxine than in the non-pregnant state.
- The thyroid gland needs to produce 50% more thyroid hormone during pregnancy to maintain a euthyroid state. Consequently, most women on levothyroxine therapy before pregnancy require an increase in dose when pregnant to maintain euthyroidism.[10] TSH and T4 levels are checked every eight weeks.
- Levothyroxine dose will need to be returned to pre-pregnancy levels after delivery and the TSH checked 6-8 weeks postpartum.
- Postpartum thyroid dysfunction (PPTD) occurs in 50% of women found to have thyroid peroxidase antibodies in early pregnancy. The hypothyroid phase of PPTD is symptomatic and requires thyroxine therapy. A high incidence (25-30%) of permanent hypothyroidism has been noted in these women. Women having transient PPTD with hypothyroidism should be monitored frequently, as there is a 50% chance of these patients developing permanent hypothyroidism subsequently.[11]

**Complications**

Congestive heart failure is the most significant potential problem. Women may also develop megacolon, adrenal crisis, organic psychosis, myxoedema coma and hyponatraemia (due to the syndrome of inappropriate secretion of antidiuretic hormone).

**Prognosis**

- Prognosis for mother and fetus is excellent with appropriate treatment.
- However, there is a small increase in stillbirth rate and fetal assessment in the third trimester is necessary.
- Recent research has suggested an increased risk of neurocognitive difficulties in children of women with hypothyroidism, even with a euthyroid fetus, as maternal thyroid hormone is needed for neuronal development until 12-13 weeks.

**Hyperthyroidism**

See separate Hyperthyroidism in Pregnancy article.

Hyperthyroidism is less common than hypothyroidism, with an approximate incidence during pregnancy of 0.2%. Overt hyperthyroidism is defined as elevated FT4 and low TSH levels, whereas subclinical hyperthyroidism is defined as asymptomatic low TSH and normal FT4 levels. Clinical symptoms of hyperthyroidism include tachycardia, nervousness, tremor, sweating, heat intolerance, proximal muscle weakness, frequent bowel movements, decreased exercise tolerance and hypertension.[12]
Thyroiditis

Aetiology
- **Acute:** usually caused by infection of the piriform sinus in younger patients.
- **Subacute thyroiditis:** de Quervain's or granulomatous thyroiditis and includes postpartum thyroiditis and infection with bacteria or mycobacteria.
- **Chronic thyroiditis:** three types are autoimmune thyroiditis - eg, Hashimoto's thyroiditis, Riedel's thyroiditis (occurs in middle-aged pregnant women) and parasitic thyroiditis.

Presentation
- **Subacute thyroiditis:** tender thyroid enlarged on one side and may have pain in the throat or otalgia. May have a history of earlier malaise and upper respiratory tract infection. Patients may show signs of thyrotoxicosis due to release of hormones from follicular destruction. At this point:
  - TSH low with free T4 elevated.
  - This is followed by raised TSH and low free T4.
- **Postpartum thyroiditis:** silent thyroiditis often presents 3-6 months postpartum and is usually painless with a positive test for thyroid peroxidase antibodies and normal ESR.
- **Chronic thyroiditis:**
  - Hashimoto's disease is characterised by antibodies to several components of thyroid tissue and uniform goitre eventually developing into hypothyroidism. Hashimoto's thyroiditis is associated with an increased risk of miscarriage. The patient may be left hypothyroid in the long term.
  - Riedel's thyroiditis presents as a hard, asymmetrical fixed thyroid gland and may cause symptoms by compressing the oesophagus or trachea.

Associations
Hashimoto's disease may be associated with other autoimmune diseases - eg, Addison's disease, pernicious anaemia. Patients with Hashimoto's disease also have an increased incidence of mitral valve prolapse. Rarely, autoantibodies cross the placenta to cause thyroiditis in the fetus.

Management
- **Subacute thyroiditis:** this usually resolves spontaneously. Patients may need treatment if there is prolonged hypothyroidism.
- **Postpartum thyroiditis:** this does not usually require treatment and may benefit from yearly reassessment.
- **Chronic thyroiditis:** more than 50% of women with Hashimoto's thyroiditis require an increase in thyroxine in the postpartum period. [13] Riedel's thyroiditis may require rescue surgery for severe compression symptoms on the trachea or oesophagus. [14]

Further reading & references
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