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.

Inadequately treated hyperthyroidism is associated with an increased risk of preterm labour, intrauterine growth restriction, pre-eclampsia and fetal death. Fetal malformations have been reported in most, but not all studies.[2]

Untreated hypothyroidism is associated with an increased incidence of obstetric complications, which include preterm birth, low birth weight (mostly related to preterm delivery), perinatal death, pregnancy induced hypertension, pre-eclampsia, placental abruption, anaemia and postpartum haemorrhage. Hypothyroidism has also been associated with adverse effects on intelligence quotient (IQ) and neuropsychological development.[2]

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.[3]

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.[3]

Thyroid peroxidase antibodies (TPAs) are present in 10% of women at 14 weeks of gestation and may be associated with:[4] [5]

- 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.[6]

The American Thyroid Association's 2017 Guidelines for managing thyroid disease around pregnancy recommend 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.[7]

Types of thyroid disease in pregnancy

- Hypothyroidism.
- Hyperthyroidism.
- Thyroiditis.

Hypothyroidism

Epidemiology

Hypothyroidism is estimated to occur in 4% of pregnancies (0.5% overt and 3.5% subclinical hypothyroidism).[8]

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.[9]

- 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.[7]

Management[10]

Arrange a referral to an endocrinology specialist for all women with overt or subclinical hypothyroidism who are:

- Planning a pregnancy:
    - Check thyroid function tests (TFTs) before conception if possible.
    - If TFTs are not within the euthyroid range, advise delaying conception and using contraception until the woman is stabilised on levothyroxine (LT4) treatment.
    - Discuss with an endocrinologist if there is any uncertainty about initiation of treatment or what dose to prescribe while waiting for specialist review.
    - There is likely to be an increased demand for LT4 treatment during pregnancy, and her dose of LT4 must be adjusted as early as possible in pregnancy to reduce the chance of obstetric and neonatal complications.
    - Advise to seek immediate medical advice if pregnancy is suspected or confirmed.
- Pregnant:
    - Check TFTs immediately once pregnancy is confirmed, and interpret results using a pregnancy-related reference range.
    - Discuss urgently with an endocrinologist regarding initiation of, or changes to, dosage of LT4 and TFT monitoring while waiting for specialist review.

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 the separate Hyperthyroidism in Pregnancy article.

Hyperthyroidism is estimated to occur in 2.4% of pregnancies (0.6% overt and 1.8% subclinical hyperthyroidism).[8]

The most common causes of thyrotoxicosis in pregnancy are gestational transient thyrotoxicosis and Graves' disease.[11]

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]

Management[13]

Pre-pregnancy:

- Arrange referral to an endocrinology specialist for all women with overt or subclinical hyperthyroidism who are planning a pregnancy, for pre-pregnancy counselling.
- Advise any woman with untreated hyperthyroidism to delay conception and use contraception until she has had specialist assessment and thyroid function has normalised.
- Advise the woman to seek immediate medical advice if pregnancy is suspected or confirmed.
- If recent radioactive iodine treatment, advise to avoid becoming pregnant for at least six months after treatment.

Pregnancy:

- Arrange emergency admission if the woman has a suspected serious complication such as thyrotoxic crisis, or intractable vomiting suggesting hyperemesis gravidarum.
- Arrange urgent specialist referral for all other pregnant women with current or previous overt or subclinical hyperthyroidism, to a joint obstetric and endocrinology clinic, depending on local availability.
- Seek urgent advice from an endocrinologist if:
    - Uncertainty whether current antithyroid drug treatment should be continued or changed during pregnancy.
    - Troublesome adrenergic symptoms (such as palpitations, tremor, tachycardia, or anxiety) which require symptomatic treatment whilst awaiting specialist assessment.

Postpartum:

- Ensure all women with overt or subclinical hyperthyroidism have thyroid function tests (TFTs) checked after delivery. This should be arranged or co-ordinated by secondary care.
- Check serum thyroid-stimulating hormone (TSH) and free thyroxine (FT4) levels 6–8 weeks postpartum, particularly if the woman has any of the following:
    - Goitre.
    - Symptoms suggestive of thyroiditis.
    - History of postpartum thyroiditis or positive thyroid peroxidase antibodies.
    - History of autoimmune thyroid disease, such as Graves' disease.
- Arrange referral to an endocrinology specialist if the TFT results are abnormal, the urgency depending on clinical judgement.

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 (but can occur up to 12 months postpartum) and is usually painless with a positive test for thyroid peroxidase antibodies and normal ESR.[8]
- **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.

Postpartum thyroiditis may present with TFTs showing an initial thyrotoxic pattern. Arrange TFT monitoring after resolution of the thyrotoxic phase, to screen for the hypothyroid phase, depending on specialist advice. Arrange annual monitoring of TFTs for all women with a history of postpartum thyroiditis which has resolved.[13]

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. [14] Reidel's thyroiditis may require rescue surgery for severe compression symptoms on the trachea or oesophagus. [15]

Further reading

- Thyroid in pregnancy project; British Thyroid Foundation
- Krassas G, Karras SN, Pontikides N; Thyroid diseases during pregnancy: a number of important issues. Hormones (Athens). 2015 Jan-Mar;14(1):59-69.
- Lazarus J, Brown RS, Daumerie C, et al; 2014 European thyroid association guidelines for the management of subclinical hypothyroidism in pregnancy and in children. Eur Thyroid J. 2014 Jun;3(2):76-94. doi: 10.1159/000362597. Epub 2014 Jun 7.

Authored by:	Peer Reviewed by: Dr Hayley Willacy, FRCGP	
Originally Published: 20/11/2023	Next review date: 13/06/2023	Document ID: doc_2866

View this article online at: patient.info/doctor/thyroid-disease-in-pregnancy

Discuss Thyroid disease in pregnancy and find more trusted resources at Patient.