Frimley Health NHS Foundation Trust

Thyroid disease in pregnancy

Key Points

- How to manage under and overactive thyroid disease in pregnancy
- Women with a past or current history of hyperthyroidism require special consideration and monitoring
- Babies born to women with positive Thyroid Receptor Antibodies are at risk of thyrotoxicosis and should have cord bloods sent
- Thyroid storm requires urgent treatment

Version:	2.0
Date Issued:	28 May 2024
Review Date:	May 2027
Key words:	Thyroid, hyperthyroidism, hypothyroidism

Abbreviations

ATD	Anti thyroid drug
(F)T3	(Free) triiodothyronine
(F)T4	(Free) tetraiodothyronine
TBG	Thyroid binding globulin
TFTs	Thyroid function tests
TPO	Thyroid peroxidase antibodies
TRAb	TSH receptor antibodies (these are the same as thyroid binding immunoglobulins)
TSH	Thyroid stimulating hormone

Contents

1.0 Thyroid disease in pregnancy: introduction

Women in the UK with well-controlled thyroid disease in pregnancy can generally anticipate healthy maternal and fetal outcomes. While adverse effects such as miscarriage, preterm birth, low birth weight, pre-eclampsia and on neonatal and infant development are sometimes seen, these can largely be avoided by maintaining a euthyroid state. Women with thyroid disease should be assigned to consultant led care for further assessment in the first trimester. If the woman maintains well controlled hypothyroidism, they may be largely cared for by their midwifery team. Those with hyperthyroidism have higher risk pregnancies and require more specialist input from a multi-disciplinary team of endocrinologists and obstetricians.

Effect of pregnancy on thyroid function

Pregnancy can alter thyroid function due to increased metabolic demands, increased serum thyroid-binding globulin, stimulation of the TSH receptor by cross-reactivity with HCG, placental transfer and breakdown of T4 and T3.

1.1 Hypothyroidism (underactive thyroid)

Hypothyroidism can result from chronic auto-immune thyroiditis (Hashimoto's disease), previous thyroid surgery or radioactive iodine treatment for hyperthyroidism, goitre or thyroid cancer. Thyroid function tests (TFTs) should be performed in all women planning a pregnancy, aiming to maintain TSH < 2.0 miU/l. If TFTs are not within euthyroid range, then conception should be delayed until thyroid function is stable.

- Women with a history of hypothyroidism should have TFTs performed once pregnancy has been confirmed, ideally within the primary care setting.
- TFTs should be sent at booking and at four weekly intervals until 20 weeks. If stable, TFTs should be repeated alongside routine antenatal 28-week bloods.
- Compliance with thyroid supplementation should be clarified with the woman and documented in the maternal notes. If the results of TFTs show inadequate replacement despite good compliance (TSH > 2.5 miU/l, free T4 < 10.0 pmol/l, free T3 < 3.5 pmol/l,) the dose of levothyroxine should be increased by 25-50mcg (by 25mcg if on </=125mcg OR 50 mcg if >/=150mcg) daily and response checked with repeat TFTs 4 weeks after dose change.
- Aim to keep TSH </= 2miU/l. Note TSH can be artificially suppressed by hCG cross-reactivity, therefore important to check free T4 levels remain adequate (i.e., **free T4 > 12 pmol/l).**
- If blood levels remains euthyroid, continue with the current dose. Women can be treated as low risk (under midwifery led care) if there is no other medical or obstetric problem.
- Repeat TFTs 4-6 weeks after any dose change.
- If **TPO antibodies** have never been tested previously, arrange where there is a past medical or significant family (1st degree relative) history of any thyroid disease. Women with positive antibodies have a 50% chance of developing **postpartum thyroiditis** and will need to have TFTs checked postpartum if symptomatic. The GP should do this at 6-12 weeks postnatally.
- If hypothyroid due to past treatment of Graves' disease, check TSH receptor antibodies (TRAbs). If positive, the paediatric team should be notified in order to arrange testing for thyrotoxicosis of the neonate. Note: levels higher than **three times** the normal range can

be associated with neonatal thyrotoxicosis. **Cord blood should be sent to check neonatal thyroid function in all babies where maternal TRAb is positive.**

- Women should be discharged home from hospital on their pre-pregnancy dose of levothyroxine unless otherwise stated. Maternal TFTs to be checked by GP at postnatal visit. (6-8weeks)

1.2 Hyperthyroidism (overactive thyroid)

Hyperthyroidism can occur for several reasons; the most common is Graves' disease (autoimmune hyperthyroidism). Other causes may be a solitary toxic nodule or multinodular goitre. For most women, hyperthyroidism improves in pregnancy, and the dose of medication is usually adjusted as the pregnancy advances, sometimes enabling cessation of treatment in the latter part of the pregnancy.

Graves' disease

- Offer pre-pregnancy counselling for women on anti-thyroid medication (ATD), e.g., carbimazole or propylthiouracil, due to the risk of agranulocytosis or fulminating liver failure secondary to treatment, although it is extremely rare. There is also a higher risk of congenital malformations in foetuses of women taking carbimazole in the first trimester vs propylthiouracil and consideration of optimal treatment for pregnancy should be discussed. Some women may choose to undergo definitive treatment (surgery or radioactive iodine) and delay conception rather than stay on ATD. Treatment with radioactive iodine necessitates delays in conception of at least six months.
  Block and replace regimens are not appropriate for women contemplating pregnancy and must be switched to ATD only regimen.

- All women with active hyperthyroidism should be referred to the endocrinology team in early pregnancy if not already under their care, or immediately when diagnosed, to optimise treatment and control.

- TFTs should be monitored four weekly. Women on ATD should have serial growth scans.

- Check **TSH receptor antibodies** (TRAb) in all women with a history of **Graves' disease**. The **paediatric team** should be alerted for **any** woman with an active or past history of Graves' disease.

- Document any special precautions for delivery or the post-natal period in patient medical record.

1.3 Thyroid storm

Thyroid storm is a rare but dangerous hypermetabolic state and warrants **immediate** referral to endocrinology. Urgent treatment is required due to high risk of maternal heart failure, shock, coma and maternal mortality rate of 25%. It is precipitated by high levels of endogenous thyroid hormones resulting from poorly treated hyperthyroidism. It can present with symptoms such as unexplained fever, altered mental state, cardiac arrhythmias, confusion or seizures. There may be a trigger event such as infection, surgery or labour and delivery. Note: delivery during thyroid storm may precipitate worsening maternal condition, and the decision to deliver should be made in conjunction with a senior obstetrician in liaison with endocrinology and ITU advice.

1.4 Gestational hyperthyroidism

Gestational hyperthyroidism is a transient condition usually limited to the first half of pregnancy and is associated with a suppressed TSH and high fT4/fT3, but no clinical or antibody evidence of thyroid autoimmunity. It is commonly found in association with hyperemesis gravidarum due to the biochemical similarity between hCG and TSH. Whilst this generally resolves spontaneously and doesn't require treatment or endocrine referral, consideration should be given to whether there is underlying thyrotoxicosis requiring treatment and early referral to endocrinology. Presence of TRAb strongly supports a diagnosis of Graves' disease and should be considered in some cases.

- If any woman has T4 > 40 pmol/l, refer to endocrinology **immediately** as early treatment is indicated.
- If T4 > 21-39 pmol/l and/or TSH <0.25mU/L, repeat in 2 weeks along with T3, and if remains high, refer to endocrinology.

1.5 Thyroid antibody types

TSH receptor antibodies (TRAb)

The presence of TRAb in maternal serum indicates the likelihood of the hyperthyroidism being due to Grave's disease (autoimmune). High levels may persist after treatment with radioactive iodine and/or after surgery. High levels of TRAb may cause transient fetal or neonatal thyrotoxicosis, as the antibodies cross the placenta. **Cord blood should be taken from the neonate for thyroid function.**

TRAb levels should ideally be checked at booking in all women with an active or past history of Graves' disease and/or taking anti-thyroid drugs, have had radioiodine therapy or thyroid surgery. If positive, re-check at 28 weeks. Women who have undergone past treatment with radioactive iodine should have their TFTs checked every six months indefinitely.

Thyroid peroxidase antibodies

These are not known to cause any fetal effects. Their presence in maternal serum does indicate a degree of maternal immune dysfunction as they indicate the potential for autoimmune processes. If these have previously been tested there is no benefit in repeating them. **If thyroid dysfunction is first identified in pregnancy testing for thyroid antibodies is necessary for establishing the cause of thyroid disease.** Women with TPO antibodies are more likely to develop postpartum thyroiditis and should be monitored for this postnatally.

1.6 Postpartum thyroiditis

Postpartum thyroiditis is more common in women with Type 1 diabetes, euthyroid women with TPO antibodies and those with a family history of hypothyroidism. It usually presents 3-6 months postpartum and can generally be managed by the woman's GP. These women also have a higher chance of developing thyroid dysfunction in future pregnancies or later in life and should be informed of this.

1.7 Breastfeeding

Only limited quantities of propylthiouracil and carbimazole, or its active metabolite are secreted in breast milk, and therefore the neonatal exposure is usually considered clinically insignificant. Propylthiouracil has less secretion within breast milk compared with carbimazole, however, doses of up to 20mg of the latter are considered safe.

1.8 Who to refer for Endocrinology opinion

- Any patient with Hyperthyroidism
- Patients with history of thyroid carcinoma
- Hypothyroid patient with difficulty in maintaining TSH target levels
- Suspicion of TSH secreting pituitary tumour (very rare)
- Thyroid hormone resistance (rare)

Women who are euthyroid with large goitres and therefore, the potential for airway compression should be referred for ENT and anaesthetic opinion.

References

thyroiddisordersinpregnancyvpeerreviewfinal.pdf (rcog.org.uk)

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Full version control record

Version:	2.0
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Library check completed:	29/3/2024
Ratified at:	Cross site Obstetric Clinical Governance Meeting 21/5/24
Date Issued:	28 May 2024
Review Date:	May 2027
Pharmaceutical dosing advice and formulary compliance checked by:	Chido Mukoko (FPH pharmacist) 18/3/2024
Key words:	Thyroid, hyperthyroidism, hypothyroidism

This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date. This guideline is for use in Frimley Health Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

Version Control Sheet

Version	Date	Guideline Lead(s)	Status	Comment
1.0	September 2020	Kim Morgan, Alexandra Tillett	Final	First cross site version, approved at OGCGC
1.1	April 2022	Alexandra Tillett	Interim	Amendment to PN care advice (final bullet point in section 1.1)
2.0	April 2024	Alexandra Tillett, Lamia Zafrani	Final	Approved at Cross site Obstetrics Clinical Governance Meeting 21/5/24

Related Documents

None.