Before, Between & Beyond Pregnancy
The National Preconception Curriculum and Resources Guide for Clinicians

Guidance for Preconception Care of Women with Thyroid Disease

Avi Alkalay, MD
Department of Obstetrics & Gynecology and Women's Health
Albert Einstein College of Medicine/Montefiore Medical Center

This guidance should not substitute for clinical judgments or expert consultation

Overview of Preconception Care of the Woman with Thyroid Disease

- Overt thyroid disease is present in 1% of women of childbearing age.
- Subclinical thyroid disease is present in 2-3% in women of childbearing age.
- Women with prior thyroid disease on medication should not abruptly stop their thyroid medications in preparation for pregnancy, and they should consult their obstetrician.
- Women on the antithyroid medication of methimazole should be converted to propylthiouracil in preparation for pregnancy.
- Universal thyroid laboratory tests are not recommended for all women seeking fertility.
- However, the following subset of women may benefit from screening:
  1) Women with a history of thyroid dysfunction in the past, including thyroid surgery.
  2) Women with a family history of thyroid disease.
  3) Women with a goiter.
  4) Women with thyroid antibodies (when known).
  5) Clinical signs of hyper/hypothyroidism.
  6) Type I Diabetes Mellitus. (Higher rate of autoimmune diseases).
  7) Other autoimmune disorders.
  8) History of infertility or recurrent pregnancy losses.
  9) Women who have had prior neck or head irradiation.

Counseling and Care Guidance Screening for Women with Hypothyroidism

- Maternal hypothyroidism, has a negative impact on the course of pregnancy, and on the neurological development in the fetus therefore appropriate management in the preconception period may improve the outcome of pregnancy.
- Because the fetus does not have the ability to form its own thyroid hormones until well into the first trimester, it is dependent on maternal thyroid production for normal development.

- Overt maternal hypothyroidism is associated with irreversible damage to the fetal intellectual development.
- Therefore, maternal hypothyroidism should be avoided prior to conception.
- The etiology of maternal hypothyroidism should be established prior to pregnancy, because certain diagnostic tests (i.e. radioactive thyroid scan) and treatments (i.e. radioactive iodine ablation of the thyroid) are not safe during pregnancy.
- If overt hypothyroidism is detected prior to pregnancy, levothyroxine dose should be titrated to achieve a TSH level of 2.5 *u*U/ml or below prior to pregnancy.
- Anticipate that thyroid medications will need to be increased by 30-50% through the course of the pregnancy, and likely as early as 6-8 weeks.
- When levothyroxine dose is changed, thyroid function tests (TSH, Free T4) should be measured in 30-40 days to evaluate its effects.
- Once a stable thyroid function level is established, thyroid function tests should be monitored in each trimester.
- Sub-clinical hypothyroidism (TSH is elevated but the Free T4 level is within the normal range) poses an unclear risk for fetal intellectual development. Replacement therapy is however recommended.
- Anticipate that postpartum, most women will require a decrease in their thyroid hormone replacement dosage.

Counseling and Care Guidance Screening for Women with Hyperthyroidism

- Maternal hyperthyroidism has been liked to an increased rate of preterm birth, low birth weight, and increased risk of pregnancy losses.
- The etiology of maternal hyperthyroidism should be established prior to pregnancy, because certain diagnostic tests (i.e. radioactive thyroid scan) and treatments (i.e. radioactive iodine ablation of the thyroid) are not safe during pregnancy.
- Overt maternal hyperthyroidism should be treated with antithyroid medication.
- Propylthiouracil is the drug of choice to treat hyperthyroidism. Methimazole has been associated with fetal developmental abnormalities and should only be used if propythiouracil is unavailable or the patient has an adverse response to propylthiouracil.
- If a women is currently on methimazole, she should be converted to propythiouracil prior to pregnancy.
- Careful attention should be made to avoid overcorrecting hyperthyroidism and ending up with hypothyroidism at the time of conception.
- The goal of antithyroid medication treatment is to maintain the mother's free T4 levels at the upper limit of normal, in order to protect the fetus from fetal hypothyroidism.
- Subclinical hyperthyroidism (TSH is low but the Free T4 level is within the normal range) poses little obstetrical or fetal risk. Treatment is not advised secondary to the potential for subsequent hypothyroidism with its risks to fetal neurological development.
- In Grave's Disease, TSH receptor antibodies can pass across the placenta and cause fetal hyperthyroidism. Therefore, the values of TSH, Free T4, TSH receptor antibodies and fetal ultrasound of the thyroid should be followed during pregnancy. Fetal heart rate monitoring is also recommended during the antepartum period.

- If radioactive iodine is the most appropriate management option in the care of the patient's thyroid condition, it should be undertaken 6 months prior to pregnancy in order to ensure stability of thyroid function and confirm remission of the thyroid disease.
- Radioactive iodine should not be administered during pregnancy. If given after 12 weeks of gestation, there is increased risk of fetal thyroid destruction.
- Subtotal thyroidectomy may be indicated in pregnancy as therapy for Grave's Disease if:
  1) Adverse reaction to antithyroid medications.
  2) High levels of antithyroid medications are required.
  3) Nonadherence to antihypothyroid medications has resulted in uncontrolled hyperthyroidism.

Pitfalls in making the diagnosis of hyperthyroidism in early pregnancy:

- When low serum TSH concentration is detected, primary hyperthyroidism must be differentiated from normal physiology during pregnancy, hyperemesis gravidarum, or gestational thyrotoxicosis.
- Physiology of pregnancy: Thyroid stimulating hormone has the same alpha subunit as beta-hCG, and therefore during the first trimester when bHCG is increasing, there is a transient period of increased thyroid hormone, and suppression of TSH.
  - Because this condition is transient, treatment is not necessary in order to reduce the risk of hyothyroidism with treatment. TSH and Free T4 should be followed.
- Hyperemesis is associated with elevated thyroid hormone levels and suppression of TSH. This is usually self-limited and antithyroid medications are not needed.

Counseling and Care Guidance Screening for Women with Thyroid Nodule.

- If a thyroid nodule is diagnosed prior to pregnancy, a careful workup should be initiated which may include TSH and Free T4 levels, an ultrasound, and a fine needle biopsy in order to determine its significance. The patient will need to follow with an endocrinologist.
- In hyperthyroidism is diagnosed secondary to a thyroid nodule, antithyroid medications should be initiated with the goal to maintain the Free T4 levels in the upper limit of normal.
- If a thyroid nodule is diagnosed during pregnancy or is growing in size, than a fine needle aspiration under ultrasound guidance should be performed.
- Surgery may be performed in the midtrimester for nodules that are rapidly growing.
- Low-grade tumors, such as papillary or follicular malignancy, may be delayed until the postpartum period. Pregnancy does not alter the course of these slow spreading thyroid malignancies.
- TSH suppression during pregnancy may be beneficial in patients who elect to postpone surgical treatment until the postpartum period.
- Pregnancy should be avoided for 6 months to 1-year post treatment with radioactive iodine to confirm stability and remission of thyroid cancer.
- Radioactive iodine must not be administered during pregnancy and lactation.

Counseling and Care Guidance Screening for Women with Autoimmune Thyroid Disease

- Fifteen percent of women of childbearing age are found to have antithyroid antibodies. The significance of this finding is unclear, and routine testing for antithyroid antibodies is not recommended.
- Women with known thyroid autoimmnunity who are euthyroid early in pregnancy are at risk for developing hypothyroidism and therefore should be monitored throughout the duration of their pregnancy.

Counseling and Care Guidance Screening for Women with a History of Postpartum Thyroiditis

- Women with a history of postpartum thyroiditis have a markedly increased risk of developing hypothyroidism in the next 5-10 years. These women should have annual TSH tests, particularly those considering another pregnancy.
- Postpartum thyroiditis is found in 7% of women in the postpartum period and causes hyper/hypothyroidism that is usually transient.

Preconceptional Recommendations of CDC Select Panel on Preconception Care Clinical Committee (Dunlop AL, Jack BW, Bottalico, JN, et al. The clinical content or preconception care: women with chronic medical conditions in: Preconception Health and Health Care: The clinical Content of Preconception care (Jack B & Atrash, H.K. ed) American J of Obstetrics and Gynecology, 199 (6B) 2008.)

- Women of reproductive age with thyroid diseases should be counseled about the risks of these conditions on pregnancy–related outcomes for the woman and offspring, and the importance of achieving optimal replacement therapy prior to conception. All women with symptoms of hypothyroidisms should be screened for thyroid disease, and if hypothyroid, they should be adequately replaced.

Strength of recommendation: A; quality of evidence: II-1

References on Preconception Thryoid Disease:

1. **Abalovich M, Amino N, Barbor, LA, Cobin RH, De Groot LJ, Glinoer D, Mandel SJ, Stagnaro-Green A**. Management of Thyroid Dysfunction during Pregnancy and Postpatum: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab 2007;92(8):S1–S47.

2. **ACOG Practice Bulletin #37**. Thyroid disease in pregnancy. August 2002.

3. **Davis LE, Loveno KJ, Cunningham FG.** Hypothyroidism complicating pregnancy. Obstet Gynecol 1988;72:108-112.

4. Dunlop AL, Jack BW, Bottalico, JN, et al. The clinical content or preconception care: women with chronic medical conditions in: Preconception Health and Health Care: The

clinical Content of Preconception care (Jack B & Atrash, H.K. ed) American J of Obstetrics and Gynecology, 199 (6B) 2008.

5. **Haddow JE, Palomaki GE, Allan WC, Williams JR, Knight GJ, Gagnon J, O'Heir CE, Mitchell ML, Hermos RJ, Waisbren SE, Faix JD, Klein RZ.** Maternal thyroid deficiency during pregnancy and subsequent nueurosychological development of the child. N Eng J Med 1999;341:549-555.

Reviewed and posted September, 2008; revised April, 2009