

Preconception management of thyroid disorders

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Abstract

Thyroid function is closely interlinked with pregnancy. Maternal and foetal outcomes can be improved if optimal thyroid function is achieved, and maintained prior to conception. This needs a systematic approach which includes rational screening, appropriate management, and pragmatic counseling. This review describes pre-conception management of thyroid disorders, and completes an earlier article on preconception management of other endocrine diseases.

Keywords: Goitre, Hyperthyroidism, Hypothyroidism, Thyroid nodules.

Executive Summary

All known thyroid disorders must be managed, and thyroid function optimized with appropriate therapy, prior to conception. Definitive (surgical, radioactive, or short term medical) therapy should be planned and completed before conception. Long term medical treatment, including hormone supplementation/replacements, should be stabilized before planning for pregnancy.

Clinical screening, with history and physical examination, is an integral part of preconception management. Goitre, menstrual disturbances, subfertility and obesity/ weight gain are pointers towards thyroid dysfunction. Biochemical screening must be conducted for common subclinical thyroid disorders, which have the potential to adversely impact maternal or foetal outcomes. These include hyperthyroidism and hypothyroidism. Targeted endocrine function testing is indicated in women presenting with subfertility, bad obstetric history, and previous history of endocrine dysfunction.

In every case, the woman should be informed about the expected natural history of her condition, planned investigations for screening, diagnosis and

management, course of treatment, financial implications, and anticipated foeto-maternal prognosis. Shared, informed decision making should be practiced at every step, in the spirit of person centered care.

Introduction

Thyroid function is closely interlinked with obstetric health.¹ Maternal and foetal outcomes can be improved if optimal thyroid function is maintained. Hence, there is a need to optimize thyroid function during the pre-conception period. This can be done by rational screening, appropriate management, and pragmatic counseling. Endocrine services are thus an integral part of pre conception management. Conventional categorization of drugs with regards to their use in pregnancy is followed in this text, even though the United States Food and Drug Administration (US FDA) has recently discontinued this process.²

Thyroid disorders are a common occurrence in women of reproductive age. These include hypothyroidism, hyperthyroidism and thyroid nodules. Thyroid health is impacted by iodine nutrition as well. Thyroid disorders, if untreated, may be associated with subfertility, bad obstetric history, and suboptimal pregnancy outcomes.³ Some forms of therapy, such as radioactive iodine and anti-thyroid drugs may have teratogenic potential.

Iodine Nutrition

All women must be counseled to use iodized salt in the pre-conception, as well as other phases of life. Iodized salt contains > 15 PPM of iodine (added as potassium iodate, KIO₃) per 100g. Ten grams of salt contains 150 mcg of iodine, which is sufficient to meet physiological requirements. There is no need to add an iodine-containing multivitamin/ mineral preparation in the preconception phase. Selenium supplementation is not recommended during pre-conception or pregnancy.

American Thyroid Association⁴ recommends a minimum of 250 µg iodine daily, and suggests that sustained iodine intake from diet and dietary

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supplements exceeding 500-1100 µg daily should be avoided due to concerns about the potential for foetal hypothyroidism.

Hypothyroidism

Screening for thyroid disorders, using a sensitive and accurate TSH assay, is indicated for all women as part of pre-conception counseling. Thyroid antibody estimation (anti-thyroglobulin, thyroid peroxidase antibodies (TPOAb)) is indicated only in select cases which pose a therapeutic dilemma.⁵ Women with history of postpartum thyroiditis or postpartum depression must be screened for thyroid status in preconception.

There is insufficient evidence to recommend for or against screening for thyroid antibodies in euthyroid women with bad obstetric history, or in women undergoing in vitro fertilization (IVF). As there is no benefit in treatment of isolated maternal hypothyroxinemia, universal FT4 screening during preconception is not recommended. Thyroid ultrasonography is not indicated as part of routine preconception workup. Radioactive scans are not indicated as part of preconception workup.

While American Thyroid Association suggests that there is insufficient evidence to recommend for or against TSH preconception testing in women at high risk for hypothyroidism, they do recommend all pregnant women be verbally screened at the initial prenatal visit for any history of thyroid dysfunction and/or use of thyroid hormone (LT4) or anti-thyroid medications. ATA also recommends serum TSH testing early in pregnancy in women at high risk for overt hypothyroidism, i.e., those with history of thyroid dysfunction or prior thyroid surgery, age >30 years, symptoms of thyroid dysfunction or the presence of goiter, TPOAb positivity, type 1 diabetes or other autoimmune disorders, history of miscarriage or preterm delivery, head or neck radiation, family history of thyroid dysfunction, morbid obesity (BMI ≥ 40 kg/m²), use of amiodarone or lithium, or recent administration of iodinated radiologic contrast, infertility, and residence of an area of known moderate to severe iodine insufficiency.

Keeping in view the high prevalence of subclinical hypothyroidism,⁶ continued prevalence of iodine deficiency, and lack of universal iodized salt use in South Asia, biochemical screening for thyroid disorders should be a mandatory part of pre conception care. It must also be noted that TSH estimation is more

economical and easily available, as compared to TPOAb testing, in most South Asian countries.

Overt hypothyroidism and subclinical hypothyroidism should be managed with l-thyroxine (category A drug), and TSH levels optimized to ≤ 2.5 mIU/l, prior to conception. Lower preconception TSH values (within the nonpregnant reference range) reduce the risk of TSH elevation during the first trimester. Select TPOAb negative patients with mild subclinical hypothyroidism may be kept under close follow-up without l-thyroxine supplementation. Such women should be monitored for progression to overt hypothyroidism with monthly serum TSH and FT4 until 16-20 weeks of gestation, and at least once between 26 and 32 weeks of gestation.

Women who are already receiving L-thyroxine should be counselled to increase their dose of LT4 by approximately 25%-30% if they miss a menstrual cycle or note a positive home pregnancy test, and notify the obstetrician promptly. A simple way of ensuring this adjustment is to increase LT4 from once daily dosing to a total of nine doses per week (29% increase).

Hyperthyroidism

All antithyroid drugs are classified as category D in pregnancy. Hyperthyroidism should be managed and stabilized, with methimazole or carbimazole, prior to conception. Patients should be switched to propylthiouracil as soon as pregnancy is diagnosed. Methimazole or carbimazole can be used as alternatives, but patients should be aware that there is a very low risk of congenital defects such as aplasia cutis and esophageal/choanal atresia. Radioactive iodine, if indicated, should be administered at least six months prior to conception. Pharmacologic doses of iodine exposure during preconception should be avoided, except in preparation for thyroid surgery for Graves' disease. While thyrotoxic women should be rendered euthyroid before attempting pregnancy, subclinical hyperthyroidism does not need pharmacological management in the pre-conception phase or in pregnancy.

Thyroid Nodules

Thyroid nodules should be evaluated, diagnosed and managed appropriately, prior to conception. Thyroid ultrasonography and fine needle aspiration cytology (FNAC) may be performed if thyroid nodular disease is detected during the preconception phase.

Summary

Rational thyroid function screening is an integral

aspect of pre conception care. Optimization of thyroid function helps ensure better outcomes in pregnancy.

References

1. Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, et al, Eds. *Willams Obstetrics*, 24th ed. New York: Mc Graw-Hill Education. 2014. pp.1147-67.
 2. Pregnancy and Lactation Labeling (Drugs) Final Rule. Available at: <http://www.fda.gov/drugs/developmentapprovalprocess/developmentresources/labeling/ucm093307.html>. Cited on March 7, 2016.
 3. Kalra S, Baruah MP, Unnikrishnan AG. Hypothyroidism in pregnancy: From unanswered questions to questionable answers. *Indian J Endocr Metab* 2013; 17: 200.
 4. Stagnaro-Green A, Abalovich M, Alexander E, Azizi F, Mestman J, Negro R, Nixon A, Pearce EN, Soldin OP, Sullivan S, Wiersinga W, American Thyroid Association Taskforce on Thyroid Disease During Pregnancy and Postpartum. Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and postpartum. *Thyroid*. 2011; 21: 1081-125.
 5. Kalra B, Agrawal S, Kalra S. Pre-conception counseling: A thyroidology perspective. *Thyroid Res Pract* 2013; 10:56.
 6. Unnikrishnan AG, Kalra S, Sahay RK, Bantwal G, John M, Tewari N. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. *Indian J Endocrin Metab* 2013; 17: 647.
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