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SCREENING FOR THYROID DISORDERS IN PREGNANT WOMEN IN A MEDICAL COLLEGE IN CENTRAL INDIA

Dr. B. Khanam[1], Dr. Siddhi Agrawal[2], Dr. Mohini Thakur[3], Dr. Naziya Noor[4]
Assoc. Prof. of Medicine[1], PG resident 2nd Year Medicine[2], PG resident 2nd Year OBG[3], Senior Resident, OBG[4]
Index Medical College Hospital and Research Centre, Indore (M.P.)[1,2,3&4]

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Corresponding author: Dr. Siddhi Agrawal
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Abstract
Thyroid disorders are particularly common in females of reproductive age group. When pregnancy is associated with alterations in maternal thyroid function, the fetus can be affected. It is important to recognize expected alterations in thyroid hormone levels during pregnancy. The clinician must be able to differentiate normal physiological changes from true thyroid disease; however, hyper- and hypo-thyroidism maybe detected first time during pregnancy. Pregnant patients with pre existing thyroid disorders require close monitoring and adjustment of therapy.(1)
Keywords: screening, thyroid, pregnant & women.

Introduction

During normal gestation there are changes in thyroid hormone physiology that are reversible after delivery. Maternal thyroid hormones are essential for maintaining pregnancy and for optimal fetal development as transplacental passage of maternal thyroid hormone occurs before fetal thyroid gland begins to function and also provides partial hormone replacement to fetus with congenital hypothyroidism (1:4000 newborns) (2).

Five factors physiologically alter thyroid function in pregnancy (2):

There is transient rise in HCG during 1st trimester. Serum TSH levels fluctuate with pregnancy coinciding with HCG levels. HCG has thyrotropic activity because of its structural similarity to TSH and high serum HCG levels stimulate the TSH receptor via a hormone specific "spillover" syndrome (3). Upper and lower limit of TSH decrease in pregnancy, with upper limit approx 4.0mIU/L at end of 1st trimester (4).

Serum thyroxine binding globulin TBG reaches about 2 times in the end of 1st trimester to middle of gestation (5). This results due to estrogen induced increase in sialylation of TBG which decreases its hepatic clearance and thus, prolongs its half life (6). Because of changes in TBG levels, normal serum T3 and T4 levels throughout pregnancy are 1.5 times the normal range (not 2 times because there is also a possible decrease in TBG saturation) (7) (8). By the 3rd trimester, free t4 levels are often lower than normal range (8) (9).

There is increased thyroid hormone metabolism by placenta. Also, maternal renal iodine clearance increases as a result of increased GFR as well as transplacental passage of iodine (10). Alterations in immune system may cause onset/exacerbation/amelioration of an underlying autoimmune thyroid disorder.

Aim:

To screen pregnant women during their ANC visit for hypo- and hyper- thyroidism

Objective:

To study, screen and identify thyroid disorders during pregnancy and plan better outcome for mother and child.

Methods:

1000 women were noted during the period January 2021 to June 2021 and out of them after applying inclusion and exclusion criteria, 300 pregnant women attending IMCHRC OPD for their ANC visit during 1st and/or 2nd trimester were screened for thyroid disorder using serum TSH & free T4 as the criteria.

Inclusion Criteria:
1. Healthy pregnant women with no known medical disorders aged 20 years and above.
2. Women in 1st or 2nd trimester of pregnancy.
3. Women with singlet pregnancy.

Exclusion Criteria:
1. Women with known thyroid and/or metabolic disorders
2. Women with multifetal gestation.
3. Women already diagnosed as hypo- or hyper- thyroid during or before the course of current pregnancy
4. Women with unreliable Last Menstrual Period details

Reference range applied: (11)
- Serum TSH: **Normal:** 0.1 – 4.5 mIU/L
- Free T4: **Normal:** 10.5 –20.0 pmol/L

Results:

Table No. 01

No. of pregnant women	Pregnant women newly diagnosed with thyroid disorder	% Prevalence of thyroid disorder in pregnant women
300	**14**	**4.67%**

Table No. 02: Distribution of cases according to serum TSH levels

Ser. TSH level	No. of cases	% calculated
Normal: 0.1 – 4.5 mIU/L **EUTHYROID**	286	95.33%
High: > 4.5 mIU/L **HYPOTHYROID**	11	**3.67%**
Low: < 0.1 mIU/L **HYPERTHYROID**	3	**1%**
TOTAL	300	100%

Table No. 03:

Free. T4 level	No. of cases	% calculated
Normal: 10.5 –20.0 pmol/L **EUTHYROID**	286	95.33%
Normal: 10.5 –20.0 pmol/L **SUBCLINICAL HYPOTHYROID**	9	**3.0%**
Low: < 10.5 pmol/L **OVERT HYPOTHYROID**	2	**0.67%**
High: > 20.0 pmol/L **HYPERTHYROID**	3	**1%**
TOTAL	300	100%

Discussion:

HYPOTHYROIDISM:

It is important to diagnose hypothyroidism because of its potential adverse impacts on pregnancy, and yet most females remain relatively asymptomatic. Only 20-30% women with overt hypothyroidism (elevated TSH, low FT4) have symptoms (12). Majority of patients with subclinical hypothyroidism (elevated TSH, normal FT4) remain asymptomatic as well.

Overt hypothyroidism can be associated with anovulatory cycles and subsequent infertility; pregnancy complications like spontaneous abortion, pregnancy induced hypertension/ preeclampsia, abruption, stillbirth, anemia, postpartum hemorrhage, preterm birth with LBW, pre mature delivery dure to pre eclampsia. The likelihood of these complications increases with overt hypothyroidism compared to subclinical hypothyroidism and also depends on the adequacy of maternal treatment. (13) (12) (14)

HYPERTHYROIDISM:

Pregnancy complications reported in hyperthyroid women are miscarriage, preterm delivery, pre eclampsia, heart failure, still birth, small for gestational age baby, thyroid storm. The frequency of poor outcomes for both mother and fetus is correlated with the degree and duration of hyperthyroidism, with the highest rates in with untreated hyperthyroidism as compared to women with controlled hyperthyroidism on antithyroid drugs therapy. (15) This highlights the importance of control of maternal hyperthyroidism to ensure optimal pregnancy outcome. However, subclinical hyperthyroidism, definesd as serum TSH level below 2.5th percentile for gestational age and normal FT4 levels, has not been found to be associated with adverse pregnancy outcomes. (16)

THYROID AUTOIMMUNITY AND EUTHYROIDISM:

The prevalence of thyroid auto antibodies in pregnant women ranges 5-17% (17) (13). These asymptomatic euthyroid women with thyroid autoantibodies are at risk of 4 complications during or after pregnancy: spontaneous miscarriage(2 to 3 folds increased risk) (18) (19), pre term delivery (<32 WOG, double the risk) (20), subclinical hypothyroidism during gestation (as many as 16%) (21) (22), postpartum thyroiditis (23). Thyroid auto-immunity maybe a marker, either for generalized activation of the immune system, or for subtle changes in maternal/fetal thyroid metabolism.

Results:

In our study we found 4.67% women to develop thyroid disorder during pregnancy in spite of having no previous thyroid disorder history. In this study, 3.67% pregnant women developed hypothyroidism, out of which 3.0% were sub clinically hypothyroid and 0.67% were overtly hypothyroid, and 1.0% women developed hyperthyroidism.

Conclusions:

Screening for thyroid disorders is crucial in pregnant women in spite of having a negative previous history of thyroid disorder. Timely screening can prompt for adequate medical management and prevent adverse outcomes as well as early anticipation of the expected outcomes prepares for their better management. If detected early, “CRETINISM” can be prevented and mentally and physically healthy babies can be delivered. Pregnant women should be prophylactically given adequate nutritional supplements to prevent thyroid disorders: RDA iodine in pregnant/ lactating women: 250mcg/dL (2). Women with known thyroid disorders who conceive, plan to conceive or women with history of

thyroid disorders in any previous pregnancies should be closely monitored and given treatment as per the latest pregnancy thyroid management guidelines.

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