Original Article:

Pregnancy and Thyroid Dysfunction: Need for Universal Screening - A Pilot Study

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Abstract:

AIM: 1. To determine Thyroid dysfunction and antiTPO antibody status in pregnant women. 2. To know the benefit of LT_4 therapy in maternal pregnancy outcome (antiTPO ab+ve vs antiTPO ab-ve groups) and 3. To determine the maternal and fetal outcomes in hypothyroid pregnant women and to decide whether universal screening of pregnant women for hypothyroidism is required or not. ***Materials and methods:*** A prospective study was done in mamata general hospital in the dept. of obg, over a period of 1 ½ years.105 antenatal women were included in the study.Outcome in these pregnancies were observed and analysed using appropriate statistical method.***Results:*** There were only 3 patients with spontaneous abortions, 3 patients with pregnancy induced hypertention and only 1 patient had preterm delivery.There was more of thyroid dysfunction in anti TPO Ab +ve cases.But there was no significant adverse effect on pregnancy outcome in patients who were treated. ***Conclusion:*** Though our study included only a small number of antenatal women who were screened for thyroid abnormality since it was only a pilot study done in our hospital since our area is endemic for thyroid disorders due to iodine deficiency we recommend Universal screening to rule out thyroid dysfunction in pregnancy because the maternal and fetal complications can be reduced by early screening, diagnosing and correcting thyroid abnormality .

Key Words: Thyroid Dysfunction, screening during pregnancy

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Introduction:

Thyroid diseases are the commonest endocrine disorders affecting women of reproductive age group[1], and hence constitute the commonest endocrine disorder complicating Pregnancy. Since pregnancy is a state of thyroid stimulation with increased iodide clearance by GFR, Placental metabolism of thyroxine and Iodide leads to increased TSH,Relative hypothyroxinemia and Goiter formation. In women the incidence of hypothyroidism diagnosed before pregnancy is 1%. Maternal and fetal complications have been found to be higher in this population [2-3].

Chorionic Gonadotropin (hCG) is TSH like structure,so there is low TSH in early pregnancy and high T_4 that correlates with hCG levels .So among TFT in Pregnancy: TT_4 assay is more robust and reliable and there is no consensus on normal FT_4 in pregnancy. Normal TT_4 in Pregnancy period is 1.5 times more than the pre -pregnancy TT_4. TSH being 0.03 – 2.3 mIU/l in the I st trimester and 0.13 – 3.2 mIU/l in the 2nd and 3rd trimesters.

Hypothyroidism has gross impact on the mother and fetus.Maternal effects being: Gestational HTN 36%(overt) and 25%(subclinical), Fetal distress and LSCS -56% vs 3%, Abruptio placenta (3 times more common) and PPH (1.8%). Impact on the fetus being impaired cognitive function. Thyroid hormone abnormality impairs somatic growth. Low birth wt babys have overt hypothyroidism in 22%, subclinical hypothyroidism in 9% when compared to general population which is only 7%. Marked improvement in growth in 10 wks is seen after correction of hypothyrodism .

Euthyroid pregnant women with antiTPOAb + values has impaired thyroid function, increased perinatal risks like spontaneous abortions in 75% and Premature deliveries in 69%. Overt thyroid disease is present in 1%,Subclinical hypothyroidism in 2-3% and antiTPO Ab positivity in 10-15%.When only high risk patients where screened 30% of hypothyroidism in pregnancy was missed. So universal

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screening was undertaken in our study.

AIM:

To determine Thyroid dysfunction and antiTPO antibody status in pregnant women. To know the benefit of LT_4 therapy in maternal pregnancy outcome (antiTPO Ab+ve vs antiTPO Ab-ve groups) and To determine the maternal and fetal outcomes in hypothyroid pregnant women and to decide whether universal screening of pregnant women for hypothyroidism is required or not.

Materials and Methods:

This was a prospective study done over 1½ years from January 2011 to June 2012 in mamata general hospital, khammam. 105 antenatal mothers admitted in the dept. of obg were included in the study. Pregnant women (Gestational period ≤32wks) with TSH > 3. 0mIU/l were studied. In all pregnant women in their first ante-natal visit - past history of thyroid disease & family history of auto- immune disease was noted. Clinical examination done to look for goiter.Investigations like TSH, T_4, T_3, AntiTPO antibody were done along with all the other basic workup.

The incidences of maternal problems in the form of hypertensive disorders complicating pregnancy, presence of associated diabetes mellitus, placental abruption, and any other medical disorder complicating pregnancy were determined. The fetal outcomes like birth weights, perinatal deaths,perinatal mortality rate, incidence of congenital anomalies, and the incidence of small for gestational age and large for gestational age babies were noted. All Pregnant women with TSH >3 mIU/l treated with levothyroxine to maintain the TSH levels between-0.5 & 3.0 mIU/l.TSH was done every 8 wks & LT_4 dose adjusted accordingly. Follow up visits were adviced. LT_4 - discontinued at delivery. TSH and antiTPO antibodies repeated 6 – 8 wks post-partum. Subjects were grouped as antiTPOAb +ve and antiTPO Ab –ve groups and their outcomes compared. AntiTPO Ab status in relation to abortions is calculated in percentage. Age and gestational period were calculated by mean and standard deviation and P-value was Assessed.

Results:

The total number of antenatal women during the study period were 105 .Among them antiTPO Ab status was known in 67 patients.It was + ve in 24 and - ve in 43 patients.Pregnancy outcome was known among 54 patients.Among them 12 patients were antiTPOAb + ve, 20 patients were antiTPOAb - ve and others 22 of them did not have there antiTPOAb testing done due to economical reasons and some were lost to follow up especially when it was done in the early weeks of pregnancy.(table -1)

Perinatal complications in relation to Spontaneous abortion (within 28wks) ,Preterm delivery (28 - 36 weeks gestation),Gestational hypertension (SBP≥140 and DBP≥90) on ≥2 occasion or patients requiring antihypertensives/termination of pregnancy and APH / PPH were studied. Among the 54 patients, 51 of them delivered in our hospital. Three of them had spontaneous abortions. 10/51 patients had caesarian section for obstetric indication.41/54 patients had vaginal delivery. Most of them had low birth weight babies in the untreated group. Good perinatal outcome was seen in treated group.

AGE AND GESTATION PERIOD (N=105)

The Mean age was 25.1 yrs (SD ± 3.5 yrs) The range being 19 – 34 yrs and The Mean gestational age was 21.5 wks (SD±8.2 yrs) The range being 6 – 32 wks.The age of the patient and gestational period were comparable in both antiTPOAb + ve and antiTPOAb - ve groups. **P value was > 0.05**.(table-2)

TPO ANTIBODY STATUS : (Total Included) n = 67 (67/105).

Positive status was found in 24 patients and Negative status in 43 patients. Mean TSH among all the patients was >3.0mIU/l.antiTPO +ve group has 5.32 mIU/l and antiTPO -ve group has 4.67 mIU/l. ***P value > 0.05***

ADVERSE PREGNANCY OUTCOMES (n=54):

Spontaneous abortion was seen in 3 patients, one patient had Preterm delivery ,three had gestational Hypertension and none of them had APH/PPH. (table -3)

Table-1: Antenatal women with TPo Ab status

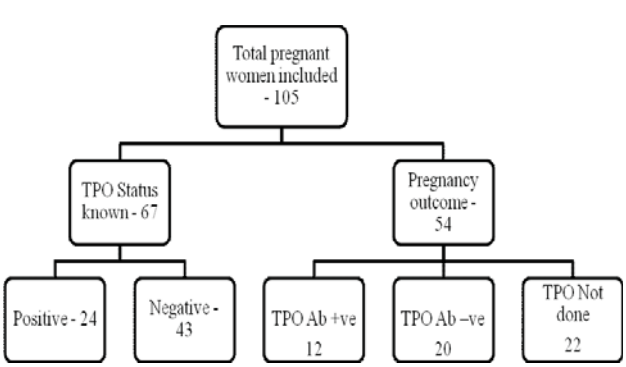

Table-2: Age-Gestational Period-TPO Status (Pregnancy outcome known)

TPO Status (54)	Age (yrs) Mean +SD	Gest Pd (wks) Mean+SD
Positive (12)	25.9+4.1	19.1+8.6
Negative (20)	25.8+3.1	22.6+7.7
Not known (22)	24.2+3.5	21.8+8.9

Table-3: Pregnancy Outcomes N=54

TPO status	Positive (12)	Negative (20)	Not known (22)
Preterm delivery	0	1	0
Spontaneous abortion	0	1	2
Hypertension	1	2	0

Discussion:

Clinical hypothyroidism is diagnosed when T_4 is low and thyroid stimulating hormone (TSH) levels are high. The variety of end organ effects and wide range of disease severity– from entirely asymptomatic individuals to patients in coma with multisystem failure – can make hypothyroidism an elusive clinical entity[4]. Overt hypothyroidism in pregnancy is rare because of its association with anovulation and infertility[5]. The incidence of hypothyroidism during pregnancy is reported to be 1% [6-7].Our study found a high incidence of hypothyroidism during pregnancy , which could be due to the fact that ours is a tertiary referral center.The incidence of hypothyroid disorder complicating pregnancy in the study group was 67/105. The number of women with miscarriage were 3. One patient had preterm delivery and 3 patients had gestational hypertention .

Perinatal mortality rate and the incidence of low birth weight babies was much higher in the hypothyroid untreated group. Evidence from our study supports the need for universal screening for hypothyroidism in pregnancy. Many studies done on delayed neurological development in babies born to hypothyroid women have been published in recent years, and have advocated routine, prepregnancy and early pregnancy screening[8]. This is further strengthened by the January 2005 statement of The American Thyroid Association and The American Association of Clinical Endocrinologists recommending routine TSH measurement during prepregnancy evaluation or as soon as pregnancy is diagnosed[7].

Though hyperthyroidism is a very rare entity encountered in pregnancy incidence being 0.1% - 0.4% ,among which Graves' disease is 85%, next common being Toxic adenoma. Gestational Thyrotoxicosis should also be kept in mind due to its adverse impact on pregnancy like first trimester abortions around 25%, preterm Labour in mothers –highest 88% in untreated mothers , 25% in partially treated and only 8% in adequately treated group.Stillbirths common in untreated group - 50 % and Preeclampsia is twice more common[9]. Impact on the fetus can be small for gestational age group and congenital malformations[10-11]. So by screening universally these complications also can be prevented.

Conclusion:

AntiTPO Ab +ve patients have greater degree of thyroid dysfunction when compared to antiTPOAb –ve patients.There was no significant higher frequency of adverse pregnancy outcomes in treated TPO Ab +ve patients. The effect of Levothyroxine is independent of TPO antibody status. So we would like to advise universal screening for thyroid disease by TSH assay. But the question of screening for antibodies is different. It does not hang on the significance of the test result, which is clear-cut, but rather lack of an adequately proven beneficial treatment[12]. Though our study included only a small number of antenatal women who were screened for thyroid abnormality since it was only a pilot study done in our hospital since our area is endemic for thyroid disorders due to iodine deficiency we propose the inclusion of serum TSH as a screening test for all pregnant mothers during their antepartum period, at the time of the booking visit for a better maternal and fetal outcome.

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