International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Jayanthy T. Int J Reprod Contracept Obstet Gynecol. 2016 Apr;5(4):1052-1055
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20160856

Research Article

Screening for thyroid disorders in pregnancy with TSH estimation

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Received: 17 February 2016
Revised: 02 March 2016
Accepted: 03 March 2016

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ABSTRACT

Background: Thyroid dysfunction is the second common endocrine disorder seen in pregnancy. There are various physiological changes in pregnancy which lead to alterations in thyroxin levels. Hypothyroidism and hyperthyroidism can have effect on pregnancy and fetus. In India there are no guidelines for screening for thyroid disorders in pregnancy. This study was performed to detect thyroid disorders in asymptomatic pregnant women, to treat them early and compare the outcome with normal pregnancies. To evaluate TSH estimation as screening test.
Methods: It was a prospective study done at Kempegowda Institute of Medical Sciences Bangalore. 400 asymptomatic pregnant women with singleton pregnancy irrespective of age, gestational age, parity and socioeconomic status were included. Multiple pregnancy and those on treatment for thyroid disorder were excluded. Written informed consent obtained. At first visit detailed history and examination was done .Apart from routine investigations estimation of TSH was done. When the TSH levels were abnormal FT4 and anti TPO antibody was estimated.
Results: The incidence of thyroid dysfunction was 12%. The association of risk factors was higher in the screen positive patients which was 28(58.3%) as compared to 44(12.5%) in Euthyroid patients, P <0.001. Maternal complications were more (65.2%) & Premature births 26.1% in patients with thyroid disorders compared to normal women (25.6%) and Premature births 6.92% , P = 0.009 .
Conclusions: Screening all pregnant women with TSH for thyroid dysfunction especially those with previous adverse pregnancy outcome is useful. Early diagnosis and treatment will definitely improve the pregnancy outcome.

Keywords: Thyroid disorders, TSH, Maternal outcome, Fetal outcome, Hypothyroid, Hyperthyroid, Euthyroid

INTRODUCTION

This study was performed to detect thyroid disorders in asymptomatic pregnant women, to treat the women early and compare the outcome with normal pregnancies and to evaluate whether TSH screening is required in all pregnant women.

Thyroid disorders are the second most common endocrine disorders seen in pregnancy. Thyroid disorders are 5-10 folds higher in women as compared to men.[3] Pregnancy is associated with many physiological changes which leads to hypothyroidism. Increased iodine requirement, increased thyroid binding globulin as a result of increased oestrogen. Rise in HCG in first trimester leads to increased FT4 and decreased TSH. In pregnancy overt hypothyroidism is seen 0.3 - 0.5%, subclinical cases are 2-3% and hyperthyroidism is seen in 0.1-0.4%.[5] Autoimmune thyroid dysfunction remains a common cause in pregnancy.

Women with thyroid disorders are at increased risks of pregnancy related complications like abortion, preeclampsia, anaemia, placental abruption and PPH.[4,9] Foetal complications include IUGR, pre term babies, high rate of still birth and neonatal deaths. There are many studies showing effect thyroid dysfunction on both maternal and foetal outcomes.[3] In India there are no guidelines as to compulsorily screen all pregnant women. This study was undertaken to evaluate whether a simple

test like estimation of TSH would be useful to identify thyroid disorders.

The aim and objectives of the study was to detect thyroid dysfunction by estimation of TSH in asymptomatic pregnant women, to evaluate the efficacy of TSH estimation as screening test and to evaluate the pregnancy outcome in thyroid dysfunction compared to Euthyroid women.

METHODS

It was a prospective study done at Kempegowda Institute of Medical Sciences Bangalore. The sample size was 400 pregnant women.

Inclusion criteria were all women who had singleton pregnancy irrespective of age, parity and socioeconomic status. Those with multiple gestation, who had been previously diagnosed to have thyroid abnormality, and pregnant women who were already on treatment for thyroid disorders were excluded. Period of study was between Jan 2012 to Dec 2013. The reference range used in the study was based on American Thyroid Association Guidelines (ATA) (2011) for the diagnosis and management. First trimester 0.1-2.5mIU/L, second trimester 0.2-3.0mIU/L and third trimester 0.3-3.0mIU/L. All pregnant women who fulfilled inclusion criteria were included in the study at the time of first visit irrespective of the gestational age. Written informed consent was taken. Detailed history and examination was done .Apart from routine investigations done in pregnancy like Hb%, blood group & Rh, OGCT, VDRL, Hbs Ag, HIV, Urine routine, Obstetric scan, Estimation of TSH was also done. When the TSH levels were found to be abnormal, FT4 and the anti TPO antibody tests were done. Interpretation was done according to reference range as per ATA guidelines.

The patients with thyroid dysfunction were started on treatment and were followed up till delivery. In our study most of the cases were hypothyroid and received thyroxine. We had two cases of hyperthyroidism that were lost for follow up. The TSH values were repeated every 6 weeks and drug dosage altered accordingly. The maternal and fetal outcome was studied.

Ethical clearance taken .No extra cost involved for the patients.

Statistical methods

Chi Square bar/Fisher exact test for study parameters on categorical scale and student T-test for continuous variables.

RESULTS

The patients were divided into the following groups according to the thyroid function tests:-

Group 1: Euthyroid where TSH was normal.

Group 2: Subclinical hypothyroid where TSH was high but normal FT4.

Group 3: Overt hypothyroid where high TSH and low FT4 were seen.

Group 4: Subclinical hyperthyroid where TSH <0.2mIU/L and normal FT4.

Group 5: Overt hyperthyroid where TSH was low and FT4 was increased.

Table 1: Age distribution.

Age (years)	Number	%
<20	18	4.5
21 – 25	100	25
26 – 30	190	47.5
31 – 35	82	20.5
36 - 40	10	2.5
Total	400	100

Mean age was 27.5± 4.06.

Table 2: Parity distribution.

Parity	Number	%
Primigravidas	228	57
Multigravidas	192	43
Total	400	100

There were 57% primis and 43% multis.

Majority of the patients belonged to first trimester.

Table 3: Trimester of study population.

Trimester	Number	%
First	190	47.5
Second	124	31
Third	86	21.5
Total	400	100
Trimester	Number	%
First	190	47.5

Out of 400 patients screened 48 (12%) were screened positive and 352 (88%) were Euthyroid.

The incidence of thyroid dysfunction was 12%.

All women who had abnormal TSH had altered free T4 values. Anti TPO abs were seen in 75% of overt hypothyroidism, 52.6% of subclinical hypothyroidism and 50% of subclinical hyperthyroid women.

Table 4: Screening results.

Results	N=400	%	Anti TPO ab positive (%)
Euthyroid	352	88	NA
Overt hypothyroid	8	2	75
Subclinical hypothyroid	38	9.5	52.6
Overt hyperthyroid	0	0	0
Subclinical hyperthyroid	2	0.5	50

The association of risk factors was higher in the screen positive patients which was seen in 28 (58.3%) as compared to 44 (12.5%) in Euthyroid patients, which was statistically significant with P <0.001.

Table 5: Maternal complications.

Complications	Normal TSH (N=352)		High TSH (N=46)		P value
	No	%	No	%	
Abortion	6	1.7	2	4.35	0.391
Anaemia	6	1.7	2	4.35	0.391
Abruptio placentae	2	0.56	4	8.7	0.036
Pre eclampsia	22	6.25	8	17.4	0.078
GDM/DM	16	4.54	10	21.74	0.009
Preterm delivery	14	3.98	8	17.4	0.026
PPROM	6	1.7	2	4.35	0.391
IUD	4	1.14	2	4.35	0.310
Poly hydromnios	4	1.13	2	4.35	0.310
PPH	6	1.7	4	8.7	0.103
Oligomnios	4	1.14	2	4.35	0.310

Maternal complications were more (65.2%) in patients with thyroid disorders compared to normal women (25.6%) and the results are shown in Table 5.

Mode of delivery

294 (85%) of euthyroid patients had normal delivery and 52 (15%) had caesarean whereas with thyroid disorders 18 (40.9%) had caesarean section with P = 0.011.

A premature birth was more in thyroid disorders 26.1% as against 6.92% in euthyroid the P value is 0.009. There were totally 24 NICU admissions out of which 8 (17.4%) were babies of mothers having thyroid dysfunction as against 16 (4.5%) in euthyroid, however there was no significant association seen with regards to the birth rates of the babies. The neonatal complications were higher in babies of mothers with thyroid disorders as compared to euthyroid mothers.

Table 6: Fetal complications.

Fetal outcome	Normal TSH (n=352)	High TSH (n=46)	Total (n=199)	P value
Abortion	6 (1.7%)	2 (4.35%)	8 (2.01%)	0.391
Fetal distress	16 (4.54%)	6 (13.04%)	22 (5.52%)	0.120
Preterm/LBW	24 (6.82%)	12 (26.1%)	36 (9.04%)	0.009
APGAR < 7	6 (1.7%)	8 (17.4%)	14 (3.52%)	0.035
NICU admission	16 (4.5%)	8 (17.4%)	24 (6%)	0.036
Neonatal morbidity	24 (6.82%)	12 (26.1%)	36 (9.04%)	0.006
Perinatal mortality	4 (1.14%)	2 (4.35%)	6 (1.51%)	0.218

DISCUSSION

It is best to screen women early in pregnancy for thyroid dysfunction because many of the pregnant women may be asymptomatic. By early diagnosis and treatment many of the complications can be prevented. In our study the incidence was 12% (48) were screened positive which is consistent with study of sahu et al i.e. 12.77%.[1] A large population study by WC Allan et al published in 2000, included 9,741 pregnant women where TSH was estimated in 2nd trimester, screen positivity was 2.2%.[2,7] Among the screened positive patients risk factors for thyroid disease were present in 58.3% (28) cases with P value less than 0.001. In this study TPO-Ab was positive in 58.33% of patients and this was seen in hypothyroid disorders which is comparable to the study by Gayathri et al.[3,5] A study by Brain Mcasey et al showed a 2 fold increase in preterm delivery and 3 fold increase in placental abruption.[4,9] The two patients with subclinical hyperthyroidism in our study was lost to follow up . The overall incidence of complications in screen positive women was 56.5% as compared 25.6% in normal women (P value 0.002) fetal complications like prematurity and perinatal morbidity was high in screen positive (26.1%) with P value 0.009.

From the result of present study , the role of routine screening for thyroid disorders becomes relevant.[5] The study recommends routine TSH screening at first visit so that many complications can be prevented by initiating the appropriate treatment.

CONCLUSION

In our study the incidence of thyroid disorders was 12%. This is significant, so it is necessary to screen all pregnant women for thyroid dysfunction especially those with previous adverse pregnancy outcome.

All women with abnormal TSH showed abnormal free T4 values, so TSH estimation can be done as screening test.

The maternal and fetal complications are more in hypothyroid women. Early diagnosis in first trimester and treatment will definitely improve the pregnancy outcome, therefore screening will be beneficial.

Funding: Not required
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Thammiah J. Screening for thyroid disorders in pregnancy with TSH estimation. Int J Reprod Contracept Obstet Gynecol 2016;5:1052-5.