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An Observational Study of Fetomaternal Outcome of Thyroid Disorder In Pregnancy In A Tertiary Care Hospital

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Abstract
Introduction: *Thyroid disorder is most common in women's as compare to male population. In females, this is the most common endocrine disorder during pregnancy resulting into abnormal maternal and fetal outcomes. Pregnancy is associated with profound changes in thyroid function. Many studies have reported that thyroid prevalence shows variation with age, sex, dietary habits, stress and geographical location.*
Materials and methods: *This study is an observational study carried on 600 women coming for antenatal check-up in Tertiary Care Hospital in Jamshedpur from January 2017-December 2017. All women who were included in this study were followed from 20-24 weeks of pregnancy up to delivery.*
Results: *It was observed that the maximum numbers of patients were in 20-25 years (51%) age group. Euthyroid (76%), hyperthyroid (02%), subclinical hyperthyroid (02%), hypothyroid (03%), and subclinical hypothyroid (08%) cases were detected. Neonatal jaundice developed in babies of all hyperthyroid patients, 50% of patients with Subclinical hyperthyroidism, 53% of patients with Hypothyroidism, 60% of patients with Subclinical Hypothyroidism and 11% of patients with Euthyroid.*
Conclusion: *Gestational age specific reference intervals are of utmost importance by which clinicians can reliably evaluate thyroid function and monitor thyroxine replacement therapy in pregnant women. TPOAb (Thyroid peroxidase Antibody) positive patients are associated with an increased risk of abortion and these infants are more often born preterm. TSH is the hallmark in detection of hypothyroid as well hyperthyroid so TSH should be included in the list of routine investigations done in all antenatal women in first trimester. If TSH values are abnormal then FT3, FT4 and TPOAb need to be checked.*
Key words: *Thyroid Disease, Hypothyroidism, Hyperthyroidism, Pregnancy.*

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I. Introduction

Thyroid diseases are the commonest endocrine disorders affecting women of reproductive age group and hence constitute the commonest endocrine disorder in pregnancy also. It has long been recognized that maternal thyroid hormone excess or deficiency can influence the outcome for mother and fetus at all stages of pregnancy as well as interfere with ovulation and fertility.**[1,2]**

Maternal hypothyroidism is the most common disorder of thyroid function in pregnancy and has been associated with miscarriage, fetal loss, preeclampsia, preterm delivery, placental abruption, low birth weight, fetal distress and reduced intellectual function of the offspring. These adverse outcomes have been associated with both overt hypothyroidism found in about 0.2% of pregnancies as well as subclinical hypothyroidism found in about 2.3% of pregnancies.**[3-6]** Subclinical hyperthyr-oidism is found in 0.4% of pregnancies.**[7]** Maternal and fetal complications of hyperthyroidism include congestive heart failure, thyroid storm, hyperemesis gravidarum, preeclampsia, preterm delivery, fetal growth restriction, still birth, fetal and neonatal thyrotoxicosis.**[8]**

Autoimmune thyroid dysfunctions remain a common cause of both hyperthyroidism and hypothyroidism in pregnant women. Graves's disease accounts for more than 85% of all cases of hyperthyroid, whereas Hashimoto thyroiditis is the most common cause of hypothyroidism. Postpartum thyroiditis (PPT) reportedly affects 4-10% of women. PPT is an autoimmune thyroid disease that occurs during the first year after delivery. Usually it is manifested by 6 to 12 weeks postpartum. Women with PPT present with transient thyrotoxicosis, hypothyroidism, or transient thyrotoxicosis followed by hypothyroidism.

II. Materials And Methods

Source Area: MGM Medical College and Hospital in Jamshedpur
Study Design: Observational Study.
Sampling Method: 600 Antenatal patients between 11- 14 weeks of gestation undergoing Antenatal Care follow up at MGM Medical College and Hospital in Jamshedpur
Inclusion Criteria: All pregnant women between 11-14 weeks of pregnancy.
Exclusion Criteria:
(i) Multi-fetal gestation;
(ii) Known chronic disorder like diabetes and hypertension;
(iii) Previous bad obstetric history.

The present study was conducted on 600 antenatal women after obtaining informed consent selected from MGM Medical College and hospital, Jamshedpur. These women were followed from 18-24 weeks up to term. A detailed history was taken regarding the symptoms and sign of thyroid disorders which included menstrual history, mobstetric history, past history, past medical history, family history and personal history. A through general physical examination in which Pulse, BP, Temperature, Respiratory rate was noted followed by CVS, CNS, RS, Local thyroid examination. Per abdomen and per vaginal examination was also done. Patient's blood samples were sent for TSH, FT3, FT4 levels. American Thyroid Association 2011 recommended trimester-specific reference ranges for TSH are:[8]

- First trimester, 0.1-2.5 μU/mL
- Second trimester, 0.2-3.0 μU/mL
- Third trimester, 0.3-3.0 μU/mL

According to Marwaha et al, the reference intervals for FT3, FT4 and TSH determined for each trimester of pregnancy in Indian population is higher compared to international cut-offs and recommended for evaluation of thyroid status of pregnant Indian women.

III. Results

	Characteristics	N	Percentage
Age group (years)	18-20	144	24
	21-25	318	53
	26-30	102	17
	31-35	36	6
Parity	Primigravida	180	30
	Multigravida with previous viable pregnancy	300	50
	Multigravida with previous abortion	120	20
Thyroid status	Euthyroid	510	85
	Hyperthyroid	12	2
	Subclinical Hyperthyroid	18	3
	Hypothyroid	18	3
	Subclinical Hypothyroid	42	7

Table 1: Patient demographic characteristics

		TSH (μU/ml)					
		<0.1	**0.1-2.5**	**2.6-5**	**5.1-7.5**	**7.6-10**	**>10**
	No of cases	16	534	16	12	11	11
Maternal	FTND (>37 weeks)	1	230	4	2	1	1
	LSCS (>37 weeks)	2	205	3	1	0	0
	VD (<37 weeks)	3	80	0	1	2	2
	LSCS (<37 weeks)	0	13	1	1	2	2
	Hyper emesis gravidarum	1	18	3	0	2	2
	Preeclampsia	3	11	2	1	3	3
	Abruption	2	13	1	1	0	0
	IUD	1	10	0	0	1	1
	Abortion	2	8	1	3	0	0
	Postpartum thyroiditis	1	12	0	2	0	0
Fetal	LBW	2	23	5	0	2	0
	Congenital anomaly	0	5	0	0	0	0
	Jaundice	1	51	3	2	1	0

Table 2: TSH level, fetal and maternal outcome

Maternal of fetal complication	Thyroid status				
	Euthyroid	Hyperthyroid	Subclinical hyperthyroid	Hypothyroid	Subclinical hypothyroid
Hyperemesis gravidarum (N=15)	4(3.65)	3(100)	4(50)	2(100)	2(100)
Preeclampsia (N=117)	10(12.65)	1(100)	2(20)	1(50)	1(50)
Preterm delivery (N=17)	11(14.95)	3(100)	1(50)	1(50)	1(50)
Abruption (N=4)	0	1(100)	2(20)	0	1(50)
Abortion (N=6)	2(2.30)	0	1(50)	1(50)	2(100)
IUD (N=3)	0	1(100)	1(50)	1(50)	0
Fetal distress (N=15)	10(12.65)	0	2(50)	1(50)	2(100)
Neonatal jaundice (N=51)	42(48.27)	5(100)	1(50)	2(100)	1(50)

Table 3: thyroid status, fetal and maternal outcome

IV. Discussion

On the basis of the results of this study, combined with those reported in the literature, some recommendations can be drawn. Overt or inadequately treated hypothyroidism is a risk factor of miscarriage and possibly preterm birth and fetal death (Abalovich et al, Allan et al).4,10 This study showed that in patients having overt hypothyroidism 20% had IUD, 13% developed preeclampsia, 53% presented with preterm labour and 07% had abruption where as those with overt hyperthyroidism-80% had hyperemesis gravidarum.

Thyroid function tests should be performed in all patients as a routine screening procedure as there is very high prevalence of thyroid disorders in Indian female. Adverse effects of thyroid disorders on pregnancy can be avoided if diagnosed early and the effects on maternal and neonatal morbidity and mortality can be reduced. These findings indicate that adequate treatment of those with known hypothyroidism and reassessment of those at risk of progressing to overt hypothyroidism during pregnancy is to be recommended- preferably before pregnancy. It is recommended that those with overt hyperthyroidism, as defined by the new trimester-specific reference intervals, are treated and closely monitored, as the need for antithyroid therapy typically decreases as pregnancy progresses.

V. Conclusion

By gestational age specific reference intervals clinicians can reliably evaluate thyroid function and monitor thyroxine replacement therapy in pregnant women. TPOAb positive are associated with an increased risk of abortion and these infants are more often born preterm. TSH is the hallmark in detection of hypothyroid as well hyperthyroid so TSH should be included in the list of routine investigations done in all antenatal women in first trimester. If TSH values are abnormal then FT3, FT4 and TPOAb need to be checked.

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