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Original Research Article

Profile and feto-maternal outcomes of pregnant women with thyroid dysfunction: a prospective study from South India

Mamatha Shivanagappa^{1*}, Mahesh Mahadevaiah², Gayathri Rao¹, Triveni Kondareddy¹

¹Department of Obstetrics and Gynecology, ²Department of General Medicine, JSS Medical College, JSS University, Mysore, Karnataka, India

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***Correspondence:**

Dr. Mamatha Shivanagappa,
E-mail: mamathamahesh106@gmail.com

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ABSTRACT

Background: There is an increasing trend in the occurrence of thyroid disorders in pregnant women. Hyperthyroidism occurs in 0.2%-0.3% and can cause foetal loss, growth retardation, pre-eclampsia, and preterm delivery. Subclinical hyperthyroidism is found in 1.5 to 1.7% but has not been associated with adverse outcomes. Incidence of overt hypothyroidism ranges from 0.2 to 2.5% and Subclinical hypothyroidism from 2-7%. There is sparse data regarding this from South India.

Methods: This was an observational, hospital based study. 1000 inpatients JSS Hospital, Mysore between November 2011 to July 2013 were studied. Included were inpatients of antenatal ward irrespective of age, parity and their gestational age. Excluded were unbooked cases in obstetric emergencies or cases in active labour. TSH estimation was done for all. If abnormal, T3 and T4 were done.

Results: With respect to thyroid status 816 (81.6%) were euthyroid, 44 (4.4%) hypothyroid, 126 (12.6%) subclinical hypothyroidism and 14 (1.4%) were hyperthyroid. 53 (5.3%) had irregular cycles 57 (5.7%) had diabetes, 98 (9.8%) hypertension. 11.4% had diabetes in hypothyroid state had 5.8% had diabetes in euthyroid state. Hypertension in hypothyroid state was 5 out of 44 (11.4%), in those with subclinical hypothyroid state it was 13 out of 126 (10.3%) and euthyroid state was 9.8%. Significantly more patients in hypothyroid state needed cesarean section. The fetal anomalies detected were 4 cases of ventriculomegaly, 2 cases of hydrocephalus, 3 spina bifida, 4 cases of renal anomalies of which 1 was renal agenesis and 3 were polycystic kidneys.

Conclusions: This study showed significant association between uncontrolled hypothyroidism and adverse fetomaternal outcome. Abnormal thyroid status was significantly associated with hypertension, diabetes, anaemia and fetal anomalies.

Keywords: Gestation, Hypothyroidism, Hyperthyroidism, Thyroid disorders

INTRODUCTION

Thyroid disease is the second most common endocrine dysfunction in women of child bearing age (diabetes being the first).^{1,2} Thyroid disease during pregnancy is challenging to diagnose because of the nonspecific symptoms and the hypermetabolic state of normal pregnancy.³ It has long been recognized that maternal thyroid hormone excess or deficiency can influence the outcome of mother and fetus at all stages of pregnancy as well as interfere with ovulation and fertility.⁴ Maternal

hypothyroidism is a common occurrence during pregnancy with overt and subclinical hypothyroidism being reported in about 0.2 and 2.3% of pregnancy respectively.⁵⁻⁷ It is associated with foetal loss, pregnancy induced hypertension preterm delivery placental abruption and reduced intellectual function in the offspring.^{8,9}

Overt maternal hyperthyroidism is less commonly observed in 0.2% to 2.5% of pregnancies and can cause foetal loss, IUGR, pre-eclampsia, preterm delivery.¹⁰⁻¹²

Mild or subclinical hyperthyroidism is found in 1.5% to 1.7% and has not been specifically associated with adverse pregnancy outcome. This study was hence taken up to know the magnitude of thyroid disorders in pregnancy in inpatients of JSS. Hospital, Mysore and to assess the outcome of pregnancy in those with thyroid dysfunction.

METHODS

This was an observational, hospital based, time bound study. 1000 inpatients of antenatal wards in JSS Hospital (a tertiary care teaching hospital, Mysore, South India) were taken up for the study. The study period was between November 2011 to July 2013. Random sampling was followed. Inpatients of antenatal ward irrespective of age, parity and gestational age were taken up. Excluded from the study were unbooked cases in obstetric emergencies or those in active labour. TSH level estimation was done by chemiluminisense immunoassay method for all the patients. If abnormal (<0.3 or >3µIU/ml) T3 and T4 was done. The patients were classified accordingly as euthyroid, hypothyroid, hyperthyroid, subclinical hyperthyroid and subclinical hypothyroid.

RESULTS

There were 1000 subjects. The age ranged from less than 20 to more than 36. Majority of the subjects 482 (48.2%) were in the age range of between 21-25 years (Table 1).

Table 1: Age distribution.

Age in years	Frequency	Percent
<20	207	20.7
21-25	482	48.2
26-30	254	25.4
31-35	43	4.3
>36	13	1.3
Total	999	100.0

464 (46.4%) were primigravida 322(32.2%) were gravida two, 144 (14.4%) were gravida three, 48 (4.8%) were gravida four and 18 (1.8%) were grand-multi (Figure 1).

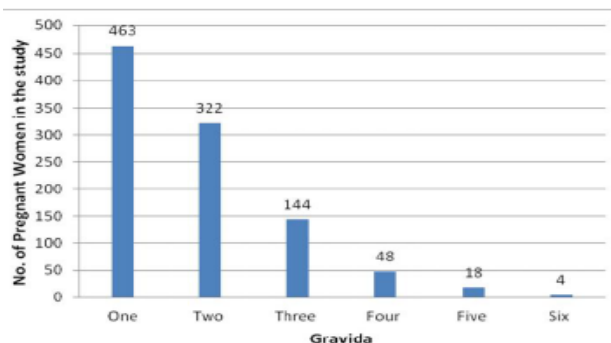


Figure 1: Gravida status of the subjects.

As regards presence of associated co-morbidities, 57 (5.7%) were diabetic and 98 (9.8%) were hypertensive (Figure 2).

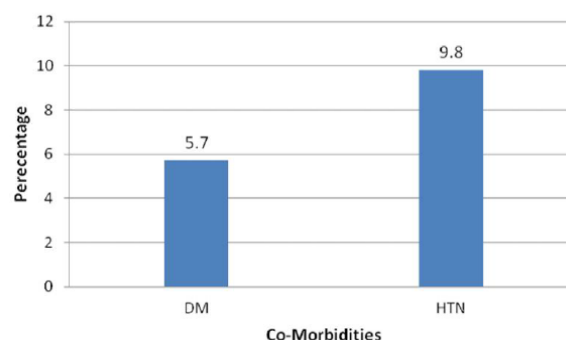


Figure 2: Depicting co-morbidities.

With respect to Menstrual history 53 (5.3%) had irregular cycles and 947 (94.7%) had regular cycles. With regard to haemoglobin level of study participants, 4 (0.4%) had <5gm%, 17 (1.7%) had 6-7gm%, 237 (23.7%) had 7.1-10gm% (Figure 3).

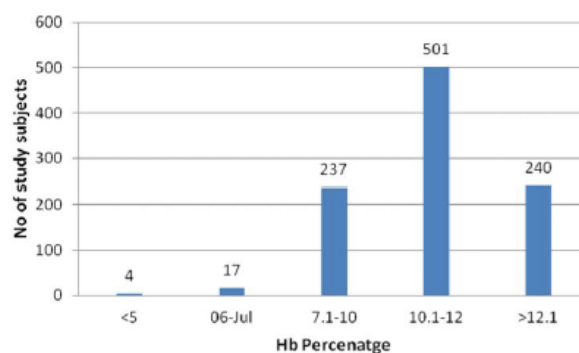


Figure 3: Depicting haemoglobin levels of study participants.

With regard to Thyroid Profile 816 (81.6%) were euthyroid, 44 (4.4%) were hypothyroid, 126 (12.6%) were subclinical hypothyroid and 14 (1.4%) hyperthyroid 7 (Table 2).

Table 2: Depicting thyroid status.

Thyroid profile	Frequency	Percent
Euthyroid	815	81.6
Hypothyroid	44	4.4
Sub hypothyroid	126	12.6
Hyperthyroidism	14	1.4
Total	999	100.0

The details regarding type of delivery were as follows. 365 (62.5%) had LSCS, 209 (35.8%) had vaginal delivery and 10 (1.7%) had outlet=forceps (Table 3). With respect to Menstrual cycle and thyroid status 7.1%

had irregular cycles in subclinical hypothyroid state, in euthyroid state 5.2% had irregular cycles (Table 4).

Table 3: Depicting type of delivery.

	Frequency	Percent
Normal vaginal	209	35.8
LSCS	365	62.5
Forceps	10	1.7
Total	584	100

Table 4: Depicting thyroid status and menstrual cycles.

	Total	Irregular	
		No	%
Euthyroid	815	42	5.2
Hypothyroid	44	1	2.3
Sub hypothyroid	126	9	7.1
Hyperthyroidism	14	1	7.1
Total	999	53	5.3

Chi-square test, p=0.7

With reference to diabetes mellitus and thyroid status 11.4% had diabetes in hypothyroid state, 5.8% had diabetes in euthyroid (Figure 4).

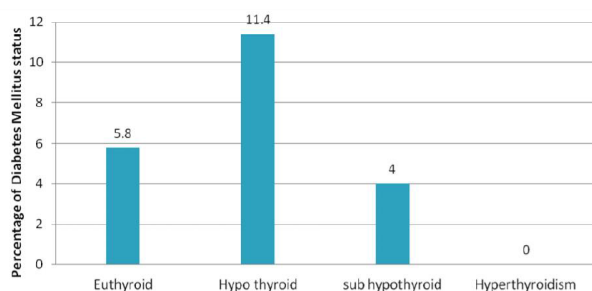


Figure 4: Depicting diabetes mellitus and thyroid status.

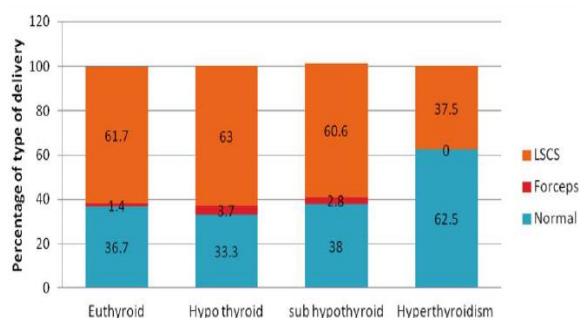


Figure 5: Depicting mode of delivery and thyroid status.

As regards hypertension and thyroid status, 11.4% had hypertension in hypothyroid state, 10.3% had hypertension in subclinical hypothyroid state, whereas only 9.8% in euthyroid state. With reference to mode of

delivery and thyroid status our study showed that need for Caesarian Section was significantly more in those with hypothyroid status (Figure 5).

Table 5: Thyroid status and anemia.

	Total	Anemia	
		No	%
Euthyroid	815	212	26.0
Hypothyroid	44	10	22.7
Sub hypothyroid	126	35	27.8
Hyperthyroidism	14	1	7.1
Total	999	258	25.8

Chi-square test, p=0.4

Outcome of delivery and thyroid status Out of 594 delivered, 7.4% in hypothyroid status had anomalies. The following anomalies were detected. 4 cases of ventriculomegaly, 2 cases of hydrocephalus, 3 spina bifida, 4 cases of renal anomalies of which 1 was renal agenesis and 3 were polycystic kidneys. Tracheo esophageal fistulas absent nasal bone diaphragmatic hernia were the other anomalies (Table 6).

Table 6: Outcome of delivery and thyroid status.

	Total	Anamoly		P
		No	%	
Euthyroid	488	15	3.1	0.4
Hypothyroid	27	2	7.4	0.2
Sub hypothyroid	71	2	2.8	0.8
Hyperthyroidism	8	0	0.0	0.6
Total	594	19	3.2	

DISCUSSION

Excess or deficiencies of maternal thyroid hormones have been associated with adverse health outcomes for both mother and child. The study of Moreno Reyes et al showed 15.3% of pregnancies having thyroid disorders and Raverot V et al showed 11% of pregnancies having thyroid disorders.^{13,14} In our study 18.4% had thyroid disorders. This is a non significantly higher incidence compared to the above two. The study of Wilson et al showed 8.5% of hypertension in euthyroid and Leung AS et al showed 7.6% and our study had 9.8% of hypertension in euthyroid.^{15,16} The results of our study are in conformity with previous studies done on different populations. The study of Leung AS et al showed 25.6% of anaemia in thyroid disorders, Davis et al showed 29.2%, Garner et al shows 24.3%, Colatrella et al showed 28% and our study had 27.8% incidence of anaemia in those with thyroid disorders.¹⁷⁻¹⁹ Once again the results were in agreement with those of previous studies in other geographical regions. Study of Haddow SE showed 5.9% of anomalies in thyroid disorders, Abalovich M showed 6.3% and our study had 7.4% of anomalies in those with thyroid disorders.^{20,21} Overall the results of our study were similar to those observed in various other studies.

The limitation of this study is the small sample size and hence further studies with larger number of subjects are needed.

CONCLUSION

This study has shown significant association between uncontrolled hypothyroidism and adverse fetomaternal outcome. There was a significant correlation between the thyroid status and prevalence hypertension, diabetes, anaemia, anomalies in our study. Central nervous anomalies and renal anomalies were more in hypothyroid state. TSH should be included in the list of routine investigations done in all antenatal women in first trimester

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Ethical approval: The study was approved by the Institutional ethical committee of JSS Medical College

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