ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 09 | September - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF HYPOTHYROIDISM BY SCREENING IN PREGNANCY AND IT'S OBSTETRIC OUTCOME

Obstetrics & Gynaecology

Dr. Rita D Professor And HOD, Department Of Obstetrics & Gynaecology, Navodaya Medical College Hospital & Research Centre, Raichur, Karnataka, India.

Dr. Akila Veera Reddy* Junior Resident, Department Of Obstetrics & Gynaecology, Navodaya Medical College Hospital & Research Centre, Raichur, Karnataka, India. *Corresponding Author

ABSTRACT

Introduction: In first trimester, the fetus relies solely on maternal thyroxine as it cannot produce thyroid hormone on its own.Early diagnosis and timely thyroxine dose adjustments are crucial for maintaining optimal hormone levels. Proper management of hypothyroidism can prevent or reduce adverse outcomes. **Aim:** Study is aimed at assessing early screening of the prevalence of hypothyroidism in pregnant women and its association with maternal and foetal outcomes. **Method:** A prospective study was conducted on 100 antenatal women attending their first antenatal visit after 13 weeks of gestation at Navodaya Medical College Hospital and Research Centre, Raichur. Thyroid function tests (TSH and free T4) were performed, and women were categorized into euthyroid, subclinical, and overt hypothyroid groups. Hypothyroid women received levothyroxine and were monitored for TSH control every 6 weeks and their obstetrics outcomes. **Result:** Hypothyroidism was identified in 29% of participants (17% subclinical, 12% overt). Hypothyroid women exhibited higher rates of preeclampsia, preterm labor, and neonatal hyperbilirubinemia compared to euthyroid women. In treated hypothyroid patients, those with good TSH control had fewer complications. Inadequately treated patients had higher complications. **Conclusion:** Early detection and adequate treatment of hypothyroidism in pregnancy significantly reduce maternal and neonatal complications.

KEYWORDS

Antenatalwomen, overt hypothyroidism, subclinical hypothyroidism, levothyroxine.

INTRODUCTION

Pregnancy is associated with a number of physiological changes that occurs as an adaptive response to the demand for fetal development and any inadequate adaption results in dysfunction that poses a serious risk to the mother as well as the baby. One such response is the changes that takes place in the thyroid glands of mother, which is vital for the development of the fetus failing which manifest as thyroid disorders of pregnancy.[1]

Maternal thyroid changes are substantial, and normally altered gland structure and function are sometimes confused with thyroid abnormalities. First, maternal serum concentrations of thyroid-binding globulin are increased concomitantly with total or bound thyroid hormone levels Second, thyrotropin, also called thyroid-stimulating hormone (TSH), currently plays a central role in screening and diagnosis of many thyroid disorders.[2]

Maternal hypothyroid is one of the common thyroid disorders resulting due to a suboptimal level of thyroid hormone production from the mother.[3] The fetal thyroid does not begin to concentrate iodine until 10–12 weeks of gestation, and the synthesis and secretion of thyroid hormone controlled by fetal pituitary thyroid stimulating hormone (TSH) ensues at approximately 20 weeks of gestation.[4] Hypothyroidism is one of the most common endocrine disorders during pregnancy. In first trimester, the fetus relies solely on maternal thyroxine as it cannot produce thyroid hormone on its own.[5]

Hypothyroidism leads to complications for both the mother and fetus i.e. during pregnancy it increases risks of miscarriage, hypertensive disorders, IUGR, low birth weight, and preterm delivery.Early diagnosis and timely thyroxine dose adjustments are crucial for maintaining optimal hormone levels.[6])Proper management of hypothyroidism can prevent or reduce adverse outcomes.[7]

Aim:

This study is aimed at assessing early screening of the prevalence of hypothyroidism in pregnant women and its association with maternal and foetal outcomes.

Objectives:

1) To assess the prevalence of hypothyroidism in pregnant women through early thyroid function screening.
2) To analyze the association between maternal hypothyroidism and obstetric outcomes

MATERIALS AND METHODS:

All the pregnant women coming to dept of OBG OPD to Navodaya Medical College, Hospital and Research Centre, Raichur will be evaluated by history taking, clinical examination and their venous sample will be tested for TSH levels. TSH will be assayed by chemiluminicent immunoassay kit (CLIA kit).In patients with deranged TSH, T3 and T4 levels will be checked. The reference range based on the Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease During Pregnancy will be used in the study.

Results of TSH will be grouped as normal, low and high. If high TSH is detected, those pregnant women will be subjected to further free T3 , T 4 levels testing and will be treated with L Thyroxine and followed up till delivery. Thyroid function tests will be repeated every six weeks during pregnancy and drug dosage will be titrated accordingly. Maternal outcome will be noted in terms of Pre-eclampsia, , Preterm labour. .Fetal outcome will be noted in terms of Preterm delivery, Low birth weight, Intrauterine growth-retardation, Neonatal Hyperbilirubinemia, and Neonatal Hypothyroidism.

Ethical Clearance

Ethical clearance was obtained from the Institutional Ethics Committee at Navodaya Medical College, Raichur before the commencement of the study. Participation was voluntary, and informed consent was obtained from all respondents.Confidentiality was maintained throughout the study.

Statistical Analysis:

The data was compiled and coded on a Microsoft Excel spreadsheet(version- 2010). Data analysis was performed using Statistical Package for social sciences (SPSS) for Windows version 17.0 (SPSS Inc., Chicago,IL). Descriptive analysis was performed using frequency and proportions for categorical variables. Bivariate analysis was conducted to look for associations between the socio-demographic characteristics and type of thyroid disorders using the chi-square test, and $p < 0.05$ was considered significant.

Methods Of Collection Of Data

Study site:Navodaya Medical College ,Hospital and Research Centre, Raichur

- **Study Design:** Prospective study
- **Study Period:** 1 year
- **Sample Size:**100 samples

Inclusion Criteria:

- All the antenatal women from period of 14 weeks of pregnancy.
- Singleton pregnancy.
- Patients willing to participate in the study.

Exclusion Criteria:

- All the antenatal women before 13 weeks of pregnancy.
- Known cases of diabetes mellitus, hypertension, autoimmune disorders and twin gestation.
- Patients with known thyroid disorder and on medication
- Women not willing to the participation in the study

RESULTS

Table 1: Prevalence And Classification Of Hypothyroidism

Thyroid Status	Number of Participants(n=100)
Euthyroid	71(71%)
Subclinical Hypothyroid	17(17%)
Overt Hypothyroid	12(12%)

Table 1 shows Prevalence of Hypothyroidism was identified in 29% of participants (17% subclinical, 12% overt).

Table 2: Clinical And Demographic Characteristics

Parameter	Euthyroid (n=71)	Subclinical (n=17)	Overt (n=12)	p-Value
Age (years)	24.9 ± 3.5	25.4 ± 3.2	25.7 ± 3.1	0.24
BMI (kg/m²)	22.3 ± 2.8	22.7 ± 3.0	23.0 ± 3.2	0.31
Gestational Age (weeks)	13.7 ± 1.6	14.0 ± 1.8	14.9± 1.7	0.26
Goiter (%)	5.6	11.8	50.0	<0.01

Table 2 shows Clinical and Demographic Characteristics P-value is significant in overt hypoythroid pregnant women with Goiter.(p-value=<0.01%)

Table 3: Serum TSH And Free T4 Levels

Parameter	Euthyroid (n=71)	Subclinical (n=17)	Overt (n=12)	p-Value
TSH (mIU/L)	2.3 ± 0.9	5.7 ± 1.2	8.9 ± 2.1	<0.01
Free T4 (ng/dL)	1.2 ± 0.2	1.1 ± 0.3	0.7 ± 0.1	<0.01

Table 3 shows Serum TSH and Free T4 Levels observed between thyroid-stimulating hormone (TSH) and free T4 levels in both subclinical and overt hypothyroid pregnant women, with a p-value of <0.01.

Table 4 : Maternal Outcomes Comparison

Maternal Complication	Hypothyroid Group (%)	Euthyroid Group (%)	p-Value
Preeclampsia	21.4	7.0	<0.01
Preterm Labor	14.3	7.0	0.04
Oligohydramnios	10.3	5.6	<0.01
Gestational Hypertension	12.1	6.3	<0.01

Table 4 shows Maternal Outcomes Comparison it was noted pregnant women with maternal complications i.e pre-eclampsia, preterm labor, oligohydramnios and gestational hypertension where p value is significant (p-value=<0.01%).

Table 5: Mode Of Delivery By Thyroid Status

Mode of Delivery	Euthyroid (n=71)	Hypothyroid (n=29)	p-Value
Normal Vaginal	63.4%	48.3%	0.04
Instrumental Delivery	7.0%	6.9%	0.98
Cesarean Section	29.6%	44.8%	0.03

Table 5 shows Mode of Delivery by Thyroid Status p-value is significant for normal delivery and cesarean delivery (P value-<0.01).

Table 6: Neonatal Outcomes Comparison

Neonatal Complications	Hypothyroid Group (%)	Euthyroid Group (%)	p-Value
Low Birth Weight	21.4	10.5	<0.01
Preterm Delivery	14.3	7.0	<0.01
Neonatal Hyperbilirubinemia	21.4	10.5	<0.01
NICU Admission	14.3	5.8	<0.01

Table 6 shows Neonatal Outcomes Comparison p-value is significant in hypothyroid group with low birth weight, preterm delivery, neonatal hyperbilirubinemia, NICU Admission(p-value=<0.01%).

Table 7 Treatment Adherence and Associated Outcomes

Outcome	Regular checkups (n=20)	Irregular checkups (n=9)
Preeclampsia	2 (10%)	4 (44.4%)
Preterm Labor	2 (10%)	1 (22.2%)
Neonatal Hyperbilirubinemia	2 (10%)	4 (44.4%)

Table 7 shows Treatment Adherence and Associated Outcomes Among the 29 hypothyroid women, those who came for regular checkups (n = 20) had significantly fewer complications than those with irregular checkups (n = 9). Poor adherence was associated with increased risk of maternal and neonatal complications.

DISCUSSION

In present study, 29% prevalence of hypothyroidism in pregnancy, notably higher than the 14.3% found by Dhanwal et al. The increase may be due to improved screening practices, and inclusion of women in early gestation.[8]

In present study,hypothyroidism is linked with higher rates of preeclampsia and gestational hypertension which was significant (p=<0.01) .[9] These findings are consistent with Sahu et al. and Leung et al where pregnancy-induced hypertension and growth restriction shows significance.[10]

In present study,neonatal outcomes were affected by maternal hypothyroidism. Rates of low birth weight, prematurity, neonatal hyperbilirubinemia (21.4% vs. 10.5%), and NICU admissions (14.3% vs. 5.8%) (p <0.01) were significantly higher in the hypothyroid group. These findings parallel to Sahu et al and Casey et al., who demonstrated increased rates of neonatal complications which was significant.[11]

In present study hypothyroid women who underwent LSCS (emergency or elective) is 44.8% (p value-0.03)which is significant. According to Roushali et al 62.1% hypothyroid pregnant women underwent LSCS. Other studies Sreelatha et al reported rates of cesarean delivery of 22.9%. (p value-0.09) which shows no significance.[12]

In present study hypothyroid pregnant women goitre was seen in 6% cases (p<0.01%) which is significant whereas, increase in thyroid volume is observed in a majority of pregnant women, leading to goiter formation at delivery in 9% of the cases in Glinoer et al., study which was not significant.[13]

Consistent with American Thyroid Association (ATA) guidelines, this study shows that adherence to levothyroxine therapy in hypothyroid pregnant women significantly reduces maternal and neonatal complications.[14]

CONCLUSION

Universal screening of thyroid hormone levels, preferably by estimation of serum TSH, should be done compulsorily in all pregnant women as part of routine antenatal care, since thyroid dysfunction is common, often asymptomatic, and has significant adverse effects on both maternal and fetal outcomes (preeclampsia, preterm labor, cesarean delivery, and neonatal morbidity) if left undiagnosed and untreated.

In the first trimester, as the fetus cannot produce TSH and relies on the mother, there will be changes in maternal TSH; therefore, we must use ranges to categorize the mother as hypothyroid or hyperthyroid after 12 weeks, and treatment should be started when indicated. Early diagnosis and appropriate management with levothyroxine decreases the risks and gives better maternal and neonatal outcome. effects on both maternal and fetal outcomes if left undiagnosed and untreated.

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