Section: Miscellaneous

Original Research Article

# PREVALENCE OF HYPOTHYROIDISM IN PREGNANT WOMEN ATTENDING NSMCH, BIHTA, PATNA

*Mamta Singh[1], Geetika Singh[2]*

[1]*Associate Professor, Department of Biochemistry, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India*
[2]*Associate Professor, Department of Community Medicine, Faculty of Medicine & Health Sciences, SGT University, Gurugram, Haryana, India*

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**Corresponding Author:**
**Dr. Mamta Singh,**
Associate Professor, Department of Biochemistry, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India.
Email: mamtagoal11@gmail.com

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ABSTRACT

**Background:** Hypothyroidism in pregnancy is associated with significant maternal and foetal morbidity. Indian studies report a higher prevalence compared to Western populations. The objective is to estimate the prevalence of hypothyroidism among pregnant women attending antenatal clinic at NSMCH, Bihta.

**Materials and Methods:** A hospital-based observational study was conducted among 117 antenatal women with uncomplicated singleton pregnancies. Thyroid function tests (TSH, FT3, FT4) were performed using chemiluminescence immunoassay.

**Results:** The overall prevalence of hypothyroidism was 12.8%, with subclinical hypothyroidism being the predominant form.

**Conclusion:** The high prevalence supports the need for routine thyroid screening in pregnancy in Indian settings.

**Keywords:** Pregnancy, Hypothyroidism, Subclinical hypothyroidism, Maternal health.

## INTRODUCTION

Pregnancy produces profound physiological changes in thyroid function due to increased human chorionic gonadotropin (hCG), estrogen-mediated rise in thyroid-binding globulin, enhanced renal iodine clearance, and increased foetal demand for thyroid hormones. Adequate maternal thyroid hormone levels are essential for normal foetal growth and neurodevelopment, particularly during early pregnancy when the foetus depends entirely on maternal thyroxine. Thyroid dysfunction during pregnancy has been associated with miscarriage, anaemia, preeclampsia, placental abruption, preterm delivery, low birth weight, and impaired neurodevelopment in offspring.[1,2]

Hypothyroidism is among the most common endocrine disorders encountered during pregnancy and may be overt or subclinical. Subclinical hypothyroidism, characterized by elevated thyroid stimulating hormone (TSH) with normal free thyroxine (FT4), is considerably more prevalent than overt hypothyroidism.[3] Recent evidence suggests that even mild thyroid dysfunction may adversely affect maternal and foetal outcomes if left untreated.[4]

The prevalence of hypothyroidism during pregnancy is reported to be 2–5% in Western populations, whereas Indian studies have demonstrated a substantially higher prevalence ranging from 4–15%.[5,6] Multicentric Indian studies conducted by Dhanwal et al. and other researchers have highlighted the increasing burden of thyroid dysfunction among antenatal women in India.[7,8] Persistent iodine insufficiency, nutritional factors, autoimmune thyroiditis, and socioeconomic determinants may contribute to this increased prevalence.[9]

Several professional bodies now advocate universal thyroid screening during pregnancy because selective screening based on risk factors may miss a significant proportion of affected women.[10] Studies from India have demonstrated that many pregnant women with hypothyroidism remain asymptomatic and are detected only through biochemical testing.[11]

Data regarding thyroid dysfunction in pregnancy from Bihar and eastern India remain limited. Hence, the present study was conducted to estimate the prevalence and pattern of hypothyroidism among pregnant women attending antenatal clinic at Netaji Subhas Medical College and Hospital.

**Objectives**

**Primary Objective**

- To estimate the prevalence of hypothyroidism among pregnant women attending antenatal clinic at Netaji Subhas Medical College and Hospital.

**Secondary Objectives**

- To determine the proportion of subclinical and overt hypothyroidism.
- To evaluate thyroid hormone profile among study participants.

## MATERIALS AND METHODS

**Study Design and Setting:** A hospital-based observational study was conducted in the Department of Biochemistry in collaboration with the Department of Obstetrics and Gynecology at Netaji Subhas Medical College and Hospital from July 2024 to December 2024.

**Study Population:** Pregnant women attending antenatal outpatient services during the study period were included.

**Inclusion Criteria**

- Pregnant women with uncomplicated singleton pregnancy.
- Women willing to participate and provide informed consent.

**Exclusion Criteria**

- Known thyroid disorder before pregnancy.
- Women receiving thyroid medication.
- Multiple pregnancy.
- Chronic endocrine or systemic illness.
- Positive family history of thyroid disease.

**Sample Size:** The sample size was calculated using the formula: n=4pq/d^2

Assuming expected prevalence of hypothyroidism as 8% based on previous Indian studies with allowable error of 5%, the minimum sample size calculated was 117.

**Data Collection:** Relevant sociodemographic and obstetric information including maternal age, parity, gestational age, and trimester were recorded using a semi-structured proforma.

**Laboratory Analysis:** Venous blood samples were collected under aseptic precautions. Serum TSH, FT3, and FT4 levels were estimated using chemiluminescence immunoassay (CLIA).

**Diagnostic Criteria**

- Subclinical hypothyroidism: Elevated TSH with normal FT4.
- Overt hypothyroidism: Elevated TSH with low FT4.

**Statistical Analysis:** Data were analyzed using SPSS version 25. Descriptive statistics such as frequencies, percentages, mean, and standard deviation were calculated. $p<0.05$ was considered to be statistically significant.

**Ethical Considerations:** Institutional Ethics Committee approval was obtained before commencement of the study. Written informed consent was obtained from all participants.

## RESULTS

A total of 117 antenatal women were included in the study. The mean age of participants was 25.8 ± 3.9 years. Majority of women belonged to the age group of 21–25 years (41.9%), followed by 26–30 years (35.0%). Multigravida women constituted 58.1% of the study population.

The overall prevalence of hypothyroidism was found to be 12.8% (15/117). Among hypothyroid women, subclinical hypothyroidism was more common and constituted 73.3% of cases, whereas overt hypothyroidism accounted for 26.7%.

A comparatively higher prevalence of hypothyroidism was observed among women aged more than 25 years and among multigravida women. Most cases were detected during the first and second trimester of pregnancy.

Mean serum TSH levels were higher among hypothyroid women, whereas FT4 levels were comparatively lower than euthyroid participants.

**Table 1: Sociodemographic and Obstetric Characteristics of Study Participants (n=117)**

| Variable | Number | Percentage (%) |
|---|---|---|
| Age Group (Years) | | |
| ≤20 | 14 | 12.0 |
| 21–25 | 49 | 41.9 |
| 26–30 | 41 | 35.0 |
| >30 | 13 | 11.1 |
| Gravidity | | |
| Primigravida | 49 | 41.9 |
| Multigravida | 68 | 58.1 |

**Table 2: Prevalence and Pattern of Hypothyroidism (n=117)**

| Thyroid Status | Number | Percentage (%) |
|---|---|---|
| Euthyroid | 102 | 87.2 |
| Hypothyroid | 15 | 12.8 |
| Pattern of Hypothyroidism (n=15) | | |
| Subclinical hypothyroidism | 11 | 73.3 |
| Overt hypothyroidism | 4 | 26.7 |

**Table 3: Distribution of Hypothyroidism According to Maternal Characteristics**

| Variable | Total Women | Hypothyroid Cases | Prevalence (%) |
|---|---|---|---|
| Age Group (Years) | | | |
| ≤20 | 14 | 1 | 7.1 |
| 21–25 | 49 | 4 | 8.2 |
| 26–30 | 41 | 7 | 17.1 |
| >30 | 13 | 3 | 23.1 |
| Gravidity | | | |
| Primigravida | 49 | 4 | 8.2 |
| Multigravida | 68 | 11 | 16.2 |

**Table 4: Mean Thyroid Hormone Levels Among Study Participants**

| Parameter | Euthyroid Women (Mean ± SD) | Hypothyroid Women (Mean ± SD) |
|---|---|---|
| TSH (mIU/L) | 2.14 ± 0.88 | 6.92 ± 2.41 |
| FT3 (pg/mL) | 3.12 ± 0.54 | 2.91 ± 0.49 |
| FT4 (ng/dL) | 1.21 ± 0.22 | 0.89 ± 0.18 |

## DISCUSSION

The present study demonstrated a relatively high prevalence of hypothyroidism (12.8%) among pregnant women attending antenatal services at Netaji Subhas Medical College and Hospital. Subclinical hypothyroidism constituted the majority (73.3%) of thyroid dysfunction cases.

The prevalence observed in the present study is comparable with the pooled prevalence of 11.07% reported in a meta-analysis conducted by Yadav et al. among Indian pregnant women.[12] Dhanwal et al. reported prevalence rates of 13.13% among pregnant women from different regions of India, which is similar to the present findings.[7]

The predominance of subclinical hypothyroidism in the present study is consistent with studies conducted by Sahu et al. and Nambiar et al., where subclinical hypothyroidism constituted the majority of thyroid dysfunction cases among antenatal women.[3,8]

A higher prevalence of hypothyroidism among women aged above 25 years and multigravida women was observed in the present study. Similar findings have been reported by previous Indian studies suggesting increasing maternal age and parity as associated factors for thyroid dysfunction during pregnancy.[5,11]

Most cases in the current study were identified during the first and second trimester, emphasizing the importance of early antenatal screening. Early diagnosis and treatment of thyroid dysfunction may help reduce maternal and foetal complications associated with hypothyroidism.[1,2]

The higher prevalence reported in Indian studies compared to Western populations may be due to differences in iodine nutrition, environmental factors, autoimmune thyroiditis, and socioeconomic determinants.[9] The findings of the present study support recommendations favouring universal antenatal thyroid screening in India.

## CONCLUSION

The present study demonstrates that hypothyroidism is relatively common among pregnant women attending antenatal services at Netaji Subhas Medical College and Hospital, with subclinical hypothyroidism constituting the majority of cases. The findings are comparable with other Indian studies reporting a higher prevalence of thyroid dysfunction during pregnancy than global estimates. Since many affected women may remain asymptomatic, routine biochemical screening during pregnancy can facilitate early diagnosis and timely management, thereby reducing adverse maternal and foetal outcomes.

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