**Original Research Article**

# Prevalence of thyroid disorder in pregnancy and pregnancy outcome

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## Abstract

**Background and objectives:** Thyroid disorders are among the common endocrine disorders in pregnant women. Our aim was to know the prevalence of thyroid dysfunction in pregnancy and its impact on obstetric outcome in Indian population.

**Materials and methods:** It was a prospective study which involved screening of 1000 pregnant women coming to routine antenatal check-up in first trimester. TSH level was estimated. If it was deranged, then FT3 and FT4 levels estimated. Patients were managed accordingly and followed till delivery. Their obstetric and perinatal outcomes were noted.

**Results:** Prevalence of thyroid dysfunction was high in this study, with subclinical hypothyroidism in (6.9%) and overt hypothyroidism in (3.4%) women. Overt hypothyroids were prone to have preeclampsia preeclampsia (14.7%), abruptio placenta (2.9%), preterm delivery (8.8%), abortion (11.8%), IUGR (11.7%), LBW (11.7%), still birth (2.9%), which is comparable to other studies. Overt hyperthyroids were prone to have miscarriage (66.7%) which was significantly high.

**Conclusion:** Prevalence of thyroid disorders, especially subclinical hypothyroidism (6.9%) and overt hypothyroidism (3.4%) was high. Significant adverse effects on maternal and fetal outcome were seen emphasizing the importance of routine antenatal thyroid screening.

**Key words**

Pregnancy, Thyroid Dysfunction, Hypothyroidism, Hyperthyroidism.

## Introduction

Development of maternal thyroid disorders during early pregnancy can influence the pregnancy outcome and fetal development. Thyroid dysfunction can lead to premature birth, pregnancy induced hypertension, low birth weight infants, IUGR, abruptio placenta and increased fetal mortality. Maternal hypothyroidism in the first trimester may be harmful for the fetal brain development and lead to mental retardation. In view of potential adverse outcomes associated with maternal thyroid disorders and obvious benefits of treatment, some expert panels have suggested routine thyroid function screening in all pregnant women. The present study is been undertaken to know the prevalence of thyroid disorders in Indian pregnant population and to know the obstetric outcomes of those pregnant women suffering from thyroid disorders.

## Materials and methods

This study was a prospective study done in 1000 cases. All the patients coming to OPD in 1st trimester for regular antenatal visits were included in study. After obtaining the gestational age and informed consent of patients in 1st trimester were randomly selected from the study. These patients fulfilled all the inclusion criteria.

**Inclusion criteria**

Pregnant women of < 12 Weeks Gestation, Singelton Pregnancy and Primigravida/ Multigravida

**Exclusion criteria**

Multifetal gestation, Known chronic disorders (Diabetes and HTN), Had previous bad obstetric history with known cause and Who planned to deliver in other hospital.

A detailed history was taken regarding the symptoms, and signs of thyroid disorders. Menstrual history, obstetric history, past history medical history, family history, personal history was obtained. A thorough general physical examination with reference to pulse, BP, Temperature, respiratory rate were noted followed by CVS, CNS, RS, Local thyroid examination. Per abdomen examination and PV examination was done and pregnancy was confirmed. Patients were sent for TSH testing. If TSH came deranged then FT3 and FT4 levels were checked. Depending upon the FT3 and FT4 values they were grouped as subclinical/overt hypothyroidism or hyperthyroidism. If they were subclinical/ overt hypothyroid, Thyroxine was started. If they are subclinical/ overt hyperthyroidism, methimazole was started. Every 8 weeks TSH level was estimated and the dose of the drug adjusted. At the end, The pregnancy outcome was noted.

The outcome variables in relation to thyroid disorders studied were Preeclampsia, Abruptio placenta, Preterm delivery, IUGR, Low birth weight, Stillborn and abortion.

Preeclampsia was defined as persistently elevated blood pressure (systolic >140 mmHg and diastolic pressure >90 mmHg on more than 2 occasions) with proteinuria. Abruption placenta was defined as a form of antepartum hemorrhage where the bleeding occurs due to premature separation of normally situated placenta. Preterm delivery was defined as delivery before 37 completed weeks of gestation. IUGR was defined as birth weight less than tenth percentile for gestational age. Low birth weight was defined as weight <2,500g. Stillbirth was defined as the birth of a new born after 28th completed week (weighing 1000g or more) when the baby does not breathe or show any sign of life after delivery. Abortion was defined as spontaneous termination of pregnancy before the period of viability.

## Results

The prevalence of thyroid disorders in our study was 12.7% with a CI of 10.5- 14.9%. The prevalence of subclinical hypothyroidism in our study was 6.9%. The prevalence of overt hypothyroidism in our study was 3.4%. The prevalence of subclinical and overt hyperthyroidism in our study was 1.8% and 0.6% respectively (**Table – 1**).

**Table – 1:** Prevalence of Thyroidal disorders among 1000 women screened.

| Type of Thyroidal disorders | No. of Cases | Percentage | Mean | SD |
|---|---|---|---|---|
| Subclinical Hypothyroidism | 69 | 6.9 | 4.11 | 1.30 |
| Overt Hypothyroidism | 34 | 3.4 | 8.82 | 3.22 |
| Subclinical Hyperthyroidism | 18 | 1.8 | 0.022 | 0.017 |
| Overt Hyperthyroidism | 6 | 0.6 | 0.013 | 0.008 |

**Table - 2:** Complications among cases of subclinical and overt Hypothyroidism.

| Subclinical Hypothyroidism (N=69) | No. of cases | % |
|---|---|---|
| **Maternal Complications** | | |
| Preeclampsia | 5 | 7.2 |
| Abruptio Placenta | 1 | 1.4 |
| Preterm Delivery | 5 | 7.2 |
| Abortion | 3 | 4.3 |
| **Fetal complications** | | |
| IUGR | 4 | 5.8 |
| Low birth weight | 3 | 4.3 |
| Still birth | 1 | 1.4 |
| **Overt Hypothyroidism(N=34)** | | |
| **Maternal Complications** | | |
| Preeclampsia | 5 | 14.7 |
| Abruptio Placenta | 1 | 2.9 |
| Preterm Delivery | 3 | 8.8 |
| Abortion | 4 | 11.7 |
| **Fetal complications** | | |
| IUGR | 4 | 11.7 |
| LBW | 4 | 11.7 |
| SB | 1 | 2.9 |

In present study, subclinical hypothyroidism was associated with complications like preeclampsia (7.2%), abruptio placenta (1.4%), preterm delivery (7.2%), abortion (4.3%), IUGR (4%), LBW (4.3%), SB (1.4%). Overt hypothyroidism was associated with complications like preeclampsia (14.7%), abruptio placenta (2.9%), preterm delivery (8.8%), abortion (11.8%), IUGR (11.7%), LBW (11.7%), SB (2.9%) as per **Table - 2**.

**Table – 3:** Complications among subclinical and overt Hyperthyroidism.

| Subclinical Hyperthyroidism(N=18) | No. of cases | % |
|---|---|---|
| **Maternal complications** | | |
| Preeclampsia | 2 | 11.10 |
| Preterm Delivery | 2 | 11.10 |
| Abortion | 1 | 5.60 |
| **Fetal complications** | | |
| IUGR | 2 | 11.10 |
| Still birth | 1 | 5.60 |
| **Overt Hyperthyroidism (N=6)** | | |
| **Maternal complications** | | |
| Abortion | 4 | 66.7 |

Subclinical hyperthyroidism was associated with complications like preeclampsia (11.1%), preterm delivery (11.1%), abortion (5.6%), IUGR (11.1%), SB (5.6%). Overt hyperthyroidism was associated with complications like Abortion (66.7%). Prevalence of thyroid dysfunction was high in this study, with subclinical hypothyroidism in (6.9%) and overt hypothyroidism in (3.4%) women. Overt hyperthyroids were prone to have miscarriage (66.7%) which was significantly high as per **Table - 3**.

## Discussion

A total of 1000 patients were screened for thyroid disorders in this study. It was prospective study. The main aim of the study was to know the prevalence of thyroid disorders in pregnancy and pregnancy outcome. The prevalence of thyroid disorders in our study was 12.7% with a CI of 10.5-14.9%. Our findings are consistent with the reports from the study of Sahu MT, et al. [2], who studied 633 women in second trimester. In their study the prevalence of thyroid disorders was also 12.7%, which is comparable to our study. The prevalence of subclinical hypothyroidism in our study was 6.9%. In the study of Sahu MT, et al. [2] the prevalence was 6.47%, which is comparable to our study. In a study done by Casey BM, et al. [3], the prevalence was 23% which is very high and not consistent with our study.

The prevalence of overt hypothyroidism in our study was 3.4%, which is partly consistent with a study done by Sahu MT, et al. [2], in which the prevalence is 4.58%. The prevalence of subclinical and overt hyperthyroidism in our study was 1.8% and 0.6% respectively. In a study done by Sahu MT, et al. [2], the prevalence was 0.9% and 0.7% for subclinical and overt hyperthyroidism. In a study done by Tuija Mannisto, et al. [4], the prevalence was 3.5% and 1.3% for subclinical and overt hyperthyroidism .The prevalence of sublinical hyperthyroidism is comparable with other studies. The prevalence of Subclinical and Overt Hyperthyroidism was 0.5 and 0.4% respectively in a study done by Stagnaro Green A study [5] as per **Table - 4**.

**Table - 4:** Prevalence of Subclinical and Overt Hyperthyroidism.

| **Study** | **Prevalence** | |
|---|---|---|
| | **Subclinical** | **Overt Hyperthyroidism** |
| Our study | 1.8% | 0.6% |
| Sahu MT [2] | 0.9% | 0.7% |
| Tuija Mannisto [4] | 3.5% | 1.3% |
| Stagnaro Green A | 0.5% | 0.4% |

In our study, subclinical hypothyroidism was associated with complications like preeclampsia (7.2%), abruptio placenta (1.4%), preterm delivery (7.2%), abortion (4.3%), IUGR (4%), LBW (4.3%), SB (1.4%). In a study done by Leung, et al., the incidence of complications were PE (15%), preterm delivery (9%), LBW (9%) in cases of subclinical hypothyroidism, which is slightly more than our study. In a study done by Sahu MT, et al. [2], the complications like PE (9.8%), preterm delivery (10.3%), IUGR (2.4%), SB (2.5%) were seen in cases of subclinical hypothyroidism. In these two studies there was no incidence of abruptio placenta and abortion, but in our study it was 1.4% and 4.3% respectively which was significant (**Table – 5**).

In our study, overt hypothyroidism was associated with complications like PE (14.7%), abruptio placenta (2.9%), preterm delivery (8.8%), abortion (11.8%), IUGR (11.7%), LBW (11.7%), SB (2.9%). In a study done by Sahu MT, et al. [2], the complications like PE (20.7%), preterm delivery (4.7%), IUGR (13.8%), SB (2.9%) were seen in cases of overt hypothyroidism. In a study done by Leung, et al. [6], the incidence of complications were PE (22%), LBW (22%), SB (4%) in cases of overt hypothyroidism. In a study done by Kriplani A, et al. [7] the complications like abruptio placenta (19%), LBW (6%), SB (3%) were seen in cases of overt hypothyroidism. The incidence of complications varied in different studies but some studies are comparable. In our study the incidence of abortion (11.8%) which is significant is not seen in other studies (**Table – 6**).

In our study, subclinical hyperthyroidism was associated with complications like preeclampsia (11.1%), preterm delivery (11.1%), abortion (5.6%), IUGR (11.1%), SB (5.6%). In our study, overt hyperthyroidism was associated with complications like Abortion (66.7%). In a study done by Robert negro, et al. [8] the hyperthyroidism in low risk group was associated with complications like gestational

HTN (16.7%), preeclampsia (0%), preterm delivery (16.7%), abortion (14.3%), SB (0%). In a study done by Tuija Mannisto, et al. [4], the subclinical hyperthyroidism was associated with complications like preeclampsia (3.5%), abruptio placenta (1%). In a study done by Miller, et al. [9], hyperthyroidism was associated with complications like preeclampsia (4.7%), LBW (2.3%). In a study done by Kriplani A, et al. [7] hyperthyroidism was associated with complications like PE (22%), preterm delivery (25%) and no perinatal death occurred in this study. The incidence of complications varied in different studies. In our study overt hyperthyroids were prone to have miscarriage (66.7%), which is significantly high (**Table – 7**).

**Table - 5:** Incidence of Complications in subclinical hypothyroidism.

| Study | Pre-eclampsia | Abruptio Placenta | Preterm Delivery | Abortion | IUGR | LBW | SB |
|---|---|---|---|---|---|---|---|
| Our study | 7.2% | 1.4% | 7.2% | 4.3% | 4% | 4.3% | 1.4% |
| Leung | 15% | - | 9% | - | - | 9% | - |
| Sahu MT | 9.8% | - | 10.3% | - | 2.4% | - | 2.5% |

**Table - 6:** Incidence of Complications in Overt hypothyroidism.

| Study | Preeclampasia | Abruptio Placenta | Preterm Delivery | Abortion | IUGR | LBW | SB |
|---|---|---|---|---|---|---|---|
| Our study | 14.7% | 2.9% | 8.8% | 11.8% | 11.7% | 11.7% | 2.9% |
| Leung [6] | 22% | - | - | - | - | 22% | 4% |
| Sahu MT [2] | 20.7% | - | 4.7% | - | 13.8% | - | 2.9% |
| Kriplani A [7] | - | 19% | - | - | - | 6% | 3% |

**Table - 7:** Incidence of Complications in hyperthyroidism.

| Study | Preeclampsia | Abruptio Placenta | Preterm Delivery | Abortion | IUGR | LBW | SB |
|---|---|---|---|---|---|---|---|
| Our study | 11.1% | - | 11.1% | 20.8% | 11.1% | - | 5.6% |
| Miller [9] | 4.7% | - | - | - | - | 2.3% | - |
| Kriplani [7] | 22% | - | 25% | | | | |
| Robert Negro [8] | - | - | 16.7% | 14.3% | - | - | - |

Some studies have not classified the cases into sub clinical and overt hyperthyroidism and the incidence of complication in them. The incidence of preeclampsia and preterm delivery was significantly high in the study of Kriplani, et al. [7] than our study.

To accept the weakness of our study, these women were not screened for thyroid antibodies. Follow up beyond new born period was not possible, after discharge most infants did not come for follow up. At present there are no available recommendations for detection or screening of thyroid dysfunction among Indian pregnant women. Recent consensus guidelines do not advocate universal thyroid function screening during pregnancy, but recommend testing for high risk women with personal history of thyroid or other autoimmune disorders or with a family history of thyroid disorders [10].

Our study shows high prevalence of thyroid dysfunction, especially subclinical and overt hypothyroidism among Indian pregnant women with associated adverse pregnancy outcome. Based on the results of the present study we therefore suggest for a decrease threshold for screening and detection of thyroid dysfunction among Indian pregnant women attending to

routine antenatal clinic and to be potentially aware of associated maternal and fetal complications.

## Conclusion

Prevalence of thyroid disorders, especially subclinical hypothyroidism (6.9%) and overt hypothyroidism (3.4%) was high. Significant adverse effects on maternal and fetal outcome were seen emphasizing the importance of routine antenatal thyroid screening.

## References

1. Kim E Barrett, Barman SM, et al. The thyroid gland. Ganong's Review of medical physiology, 23rd edition, 2010; p. 301-340.
2. Sahu MT, et al. Overt and subclinical thyroid dysfunction among Indian pregnant women and its effect on maternal and fetal outcome. Archives of gynecology and obstetrics, 2010; 281(2): 215-220.
3. Casey BM, Dashe JS, Well CE, et al. Subclinical hypothyroidism and pregnancy outcomes. Obstet . Gynecol., 2005; 10(5): 239-245.
4. Tuija Mannisto, Marja Vaarasmaki, et al. Thyroid dysfunction and maternal morbidity. J Clin Endocrinol Metab., 2010; 95(3): 1084-1094.
5. Stagnaro GA, et al. Overt Hyperthyroidism and Hypothyroidism during pregnancy. Clin Obstet Gynaecol., 2011; 54(3): 478-82.
6. Leung AS, Millar L.K, Kooning PP, Montorom, Mestman J. Perinatal outcomes in hypothyroid pregnancies. Obstet Gynecol., 1993; 81(3): 349-353.
7. Kriplani A, Buckshee K, et al. Maternal and perinatal outcome in thyrotoxicosis complicating pregnancy. Eur J Obstet Gynecol Reprod Biol., 1994; 54(3): 159-63.
8. Robert Negro, Alan Schwartz, et al. Detection and treatment of thyroid in pregnancy. J Clin Endocrinol Metab., 2010; 95(4): 1699-1707.
9. Millar LK, Wing DA. Low birth weight and preeclampsia in pregnancies complicated by hyperthyroidism. Obstet Gynecol., 1994; 84(6): 946-9.
10. Vaidya B, Antony S. Bilousm, et al. Detection of Thyroid dysfunction in early pregnancy. Universal screening or high risk targeted case finding? J Clin Endocronol. Metab., 2007; 92(1): 203-207.