International Journal of Reproduction, Contraception, Obstetrics and Gynecology
*Popli S et al. Int J Reprod Contracept Obstet Gynecol. 2023 Jun;12(6):1789-1792*
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20231556

**Original Research Article**

# Fetomaternal outcome in pregnant women with derranged thyroid function

**Sangeeta Popli, Jandrasupalli Shreshta, Suman Dath S.*, Manisha Sharma**

Department of Obstetrics and Gynaecology, Hindu Rao Hospital, New Delhi, India

**Received:** 14 April 2023
**Accepted:** 08 May 2023

***Correspondence:**
Dr. Suman Dath S.,
E-mail: drsumandutt@gmail.com



## ABSTRACT

**Background:** Thyroid dysfunction is the second most common endocrine disorder observed during pregnancy after diabetes. Universal screening of thyroid disorders is recommended in the first trimester of pregnancy. The present study aims to determine the fetomaternal outcome in women with thyroid dysfunction.
**Methods:** The study was a prospective observational study conducted at Department of Obstetrics and Gynaecology, Hindu Rao Hospital and North DMC Medical College, Delhi from January 2019 to June 2022. It was approved by Institutional Ethics Committee. Pregnant women aged 18 to 40 years up to 20 weeks of gestational age with singleton pregnancy were included in this study. All the data was entered in pre designed proforma. The data analysis was done by statistical package for Social Sciences (SPSS) version 21.0.
**Results:** A total of 110 pregnant women were included in the study. 55 pregnant women with thyroid dysfunction were taken as study group and 55 euthyroid pregnant women were taken as controls. With respect to maternal complications, neonatal birth weight and Apgar score in the study group are significant.
**Conclusions:** Timely screening for thyroid dysfunction during pregnancy will reduce fetomaternal complications.

**Keywords:** Hyperthyroidism, Hypothyroidism, Subclinical hypothyroidism

## INTRODUCTION

Thyroid disorders are one of the most common endocrine disorders in pregnancy.[1] The prevalence of hypothyroidism during pregnancy is estimated to be 0.3-0.5% for overt hypothyroidism and 2-3% for subclinical hypothyroidism.[2] Sub clinical hyperthyroidism is found in 1.7% of pregnancies and overt hyperthyroidism is seen in 0.8% of pregnant women.[3] The most common cause of hyperthyroidism in pregnancy is Grave's disease which accounts for 85-90% of all cases.[4]

In normal pregnancy, there is a physiological increase in free thyroxine and a decrease in thyrotropin (TSH). These changes in pregnancy are maximum at 10 to 12 weeks of gestation when the human chorionic gonadotropin (HCG) concentration peaks. During the first 20 weeks of gestation the increase in thyroxine-binding globulin (TBG) is due to decrease in its clearance and an estradiol-induced increase in synthesis of TBG.[5]

Women with hypothyroidism, both overt and subclinical are at increased risk of complications in pregnancy such as threatened abortion, preeclampsia, preterm labor, placental abruption, postpartum haemorrhage. Fetal complications include low birth weight babies, neonatal hypothyroidism and increased perinatal morbidity and mortality.[6]

Diagnosis of hyperthyroidism can be difficult because healthy pregnant women may also exhibit symptoms of tachycardia, palpitations, mild heat intolerance, emotional liability, diaphoresis. Maternal complications of hyperthyroidism include congestive heart failure, thyroid storm, hyperemesis gravidarum, preeclampsia, fetal growth restriction, still birth, preterm delivery, fetal and neonatal thyrotoxicosis.[7]

It has been recognized that maternal thyroid hormone deficiency or excess can influence the outcome for mother and fetus at all stages of pregnancy.[8,9] Undiagnosed hypothyroidism in pregnancy may affect neuropsychological development of the child and thus warrants screening of thyroid deficiency during pregnancy.[10] Therefore, this study was planned to assess fetomaternal outcome in thyroid dysfunction.

## METHODS

It was a prospective observational study conducted at Department of Obstetrics and Gynaecology, Hindu Rao Hospital and North DMC Medical College, Delhi from January 2019 to June 2022. The study was approved by Institutional Ethics Committee. Sample size was calculated according to study done by Sreelatha et al.[11] After informed consent a total of 110 pregnant women who attended the antenatal clinic in our hospital were recruited and divided into two groups. Study group with thyroid dysfunction-55 and euthyroid group (control) -55.

Pregnant women aged 18 to 40 years up to 20 weeks of gestational age with singleton pregnancy were included in this study. Women with multiple pregnancy, hyperemesis gravidarum, hydatidiform mole, choriocarcinoma, history of thyroiditis, thyroid malignancy, chronic hypertension, diabetes, drugs altering thyroid function and any other coexisting medical conditions were excluded from this study.

Serum TSH was done as a screening test on the first visit. Estimation of free T3 and T4 were done in 55 pregnant women with deranged TSH. Thyroid profile was done by chemiluminescence assay. All the data was entered in pre designed proforma both the groups were followed till delivery. Neonates were followed till seventh day of birth.

### *Statical analysis*

Categorical variables was done in number and percentage. Continuous variables were done as mean ±SD and median values. Comparison of qualitative variables were analysed by Chi-square test/ fisher's extract test. Quantitative variables were analysed using Mann Whitney test and independent t test. The data analysis was done by statistical package for Social Sciences (SPSS) version 21.0.

## RESULTS

The mean age of study and control group was 25.62 and 25.02 respectively with p value not significant. 28 cases and 19 controls were primigravida, 27 cases and 36 control are multigravida with p value not significant (Table 1).

Out of 55 cases with deranged thyroid function tests; 94.55% were hypothyroid, 5.46% were hyperthyroid (Table 2).

**Table 1: Comparison of age and gravid status of study and control group with other study.**

| | Study group (n=55) | Control group (n=55) | Sreelatha et al[11] (n=100) |
|---|---|---|---|
| **20 -25 Years** | 31 | 31 | 35 |
| **26 -30 Years** | 18 | 23 | 49 |
| **31-35 Years** | 6 | 1 | 16 |
| **Primigravida** | 28 | 19 | 49 |
| **Multigravida** | 27 | 36 | 51 |

**Table 2: Distribution of thyroid disfunction in study group and other study.**

| | Hypothyroid | | Hyperthyroid | |
|---|---|---|---|---|
| | **Subclinical hypothyroidism** | **Overt hypothyroidism** | **Subclinical hyperthyroidism** | **Overt hyperthyroidism** |
| **Study group (n=55)** | 39 (70.91%) | 13 (23.64%) | 2 (3.64%) | 1 (1.82%) |
| **Patel et al[14] (n=70)** | 40 (57.14%) | 15 (21.42%) | 10 (14.28%) | 5 (7.14%) |

**Table 3: Comparison of antenatal complications in both study and control group with other study.**

| Antenatal Complications | Study group (n-=55) | | Control group (n=55) | | Kumar R et al[12] (n=102) | |
|---|---|---|---|---|---|---|
| **No complications** | 28 | 50.91% | 41 | 74.55% | 35 | 34.31% |
| **Complications** | 27 | 49.09% | 14 | 25.45% | 67 | 65.69% |
| **Preeclampsia** | 9 | 16.36% | 3 | 5.45% | 14 | 13.72% |
| **Anaemia** | 6 | 10.91% | 3 | 5.45% | 7 | 6.80% |
| **Miscarriage** | 5 | 9.09% | 1 | 1.82% | 12 | 11.76% |
| **Intra uterine death** | 4 | 7.27% | 2 | 3.64% | 5 | 4.90% |
| **Fetal growth retardation** | 3 | 5.45% | 4 | 7.27% | 2 | 1.96% |
| **Abruption** | 2 | 3.64% | 1 | 1.82% | 0 | 0.00% |

A 49.09% of the cases and 25.45% of the controls had complications with p value significant (0.010).

As shown in Table 3. Four intra uterine death and five miscarriage were noted in study group two intra uterine death and one miscarriage were noted in control group. 70% study group and 62.96% controls had full term deliveries. 30% study group and 37.04% controls had preterm deliveries, with a p value (0.448). As shown in Table 4 significant difference was noted in the mode of delivery between the two groups with a p value (0.821).

**Table 4: Comparison of mode of delivery in our study with other study.**

| Mode of Delivery | Case (n=30) | Control (n=54) | Patel et al (n=61) |
|---|---|---|---|
| **Lower segment CS** | 12 (24%) | 14 (25.93%) | 17 (27.8%) |
| **Normal vaginal delivery** | 38 (76%) | 40 (74.07%) | 44 (72.13%) |

**Table 5: Comparison of neonatal outcome in both study and control group.**

| | Study group(n=50) | Control group(n=54) | P value |
|---|---|---|---|
| **APGAR score <7** | 13 (26%) | 6 (11.11%) | 0.05 |
| **APGAR score >7** | 37 (74%) | 48 (88.89%) | |
| **Normal birth weight** | 40 (80%) | 51 (94.44%) | 0.037 |
| **Low birth weight** | 10 (20%) | 3 (5.56%) | |
| **NICU not required** | 37 (80.43%) | 48 (92.31%) | 0.134 |
| **NICU required** | 9 (19.57%) | 4 (7.69%) | |

As shown in Table 5, 26% of the neonates of the cases and 11.11% of the neonates of the controls had APGAR score <7 at one minute after birth with p value significant (0.05). A 20% of neonates of cases and 5.56% of neonates of controls had low birth weight with p value significant (0.037). No significant difference was noted in requirement of NICU admission between the two groups.

A 13.04% of neonates of cases had hyperbilirubinemia and none of the neonates of controls had hyperbilirubinemia with p value (0.009).

## DISCUSSION

Thyroid disorders are the most common medical disorders in pregnancy. The present study was conducted to find out fetomaternal outcome in thyroid dysfunction. Subjects were recruited in the study and followed till delivery. As shown in Table 1 age of our study group and Gravidity are comparable with Sreelatha et al.[11]

Out of 55 cases with deranged thyroid function tests 70.91% had subclinical hyperthyroidism, 23.64% had over hypothyroidism. Total 3.64% had subclinical hyperthyroidism and 1.82% had overt hyperthyroidism. Similar results of thyroid dysfunction were found with Patel et al (2016)[12].

As shown in Table 3, 49.09% of the cases and 25.45% of the controls had complications with p value significant. Various antenatal complications are comparable with Kumar et al.[13]

There were 70% of the cases and 62.96% of the controls had full term deliveries. 30% of the cases and 37.04% of the controls had preterm deliveries. Similar results were found with Patel et al 50.81% and 21.31% respectively.[12] Mode of delivery of our study group was comparable were with Patel et al.[12]

As shown in Table 5, study was comparable to study done by Kumar et al, it found that low APGAR score (<7) was 12.2% in women with hypothyroidism.[13] There were 20% of the neonates of study group and 5.56% of the neonates of controls had low birth weight, with p value was significant ( 0.037). This study was comparable to study done by Sreelatha et al found out that 21.9% of the mothers with deranged thyroid function tests had LBW babies.[11]

Out of 46 neonates of study group 82.61% and 92.31% neonates of controls had no complications. Hyperbilirubinemia was seen in 13.04% of the neonates of cases and none had hyperbilirubinemia in neonates of controls with significant p value. There were 2.17% of the neonates of cases and 1.92% of the neonate of the controls had hypothermia p value not significant. There were 6.53% of the neonates of cases and 5.77% of the neonates of the controls had RDS p value not significant.

This study was comparable to the study conducted by Sreelatha et al11, which found out that hyperbilirubinemia was seen in (9.4%) of the babies of mothers with deranged thyroid function tests.

This study sample size was small as the study was time bound. More studies are required in a large population to substantiate our results.

## CONCLUSION

This study concludes that maternal and fetal complication were more in women with derranged thyroid function tests as compared to women with euthyroid state. Early diagnosis and treatment of thyroid disorders can prevent complications in both mother and fetus.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Abalovich M, Amino N, Barbour LA, Cobin RH, De Groot LJ, Glinoer D, Mandel SJ, Stagnaro-Green A. Management of thyroid dysfunction during pregnancy and postpartum: an Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metabol. 2007;92(8_supplement):s1-7.
2. Glinoer D. The systematic screening and management of hypothyroidism and hyperthyroidism during pregnancy. Trends in Endocrinol Metabol. 1998;9(10):403-11.
3. Gedam JK, Rajput DA. Prevalence of thyroid disorders among patients attending the antenatal clinic at tertiary care centre, Parel, Mumbai, India. Inter J of Reprod Contracep Obstet Gynecol. 2017;6(4):1235-9.
4. Marx H, Amin P, Lazarus JH. Hyperthyroidism and pregnancy. Bmj. 2008;336(7645):663-7.
5. Lazarus JH, Premawardhana LD. BEST PRACTICE NO 184 Screening for thyroid disease in pregnancy. J Clin Pathol. 2005;58(5):449-52.
6. Glinoer D, NAYER PD, Bourdoux P, Lemone M, Robyn C, Steirteghem AV, et al. Regulation of maternal thyroid during pregnancy. J Clin Endocrinol Metabol. 1990;71(2):276-87.
7. Hadley ME, Levine JE. Thyroid hormones. Endocrinol. 1996;4:290-337.
8. Casey BM, Leveno KJ. Thyroid disease in pregnancy. Obstet Gynaecol. 2006;108(5):1283-92.
9. Casey BM, Dashe JS, Wells CE, McIntire DD, Byrd W, Leveno KJ, Cunningham FG. Subclinical hypothyroidism and pregnancy outcomes. Obstet Gynecol. 2005;105(2):239-45.
10. Dussault JH, Fisher DA. Thyroid function in mothers of hypothyroid newborns. Obstet Gynecol. 1999;93(1):15-20.
11. Sreelatha S, Nadagoudar S, Asha Devi L. The study of maternal and fetal outcome in pregnant women with thyroid disorders. Int J Reprod Contracept Obstet Gynecol. 2017;6(8):3507-13.
12. Patel RD, Deliwala KJ, Shah PT, Singh RK, Fetomaternal outcome of thyroid disorder in pregnancy. Int J Reprod Conttacept Obstet Gynecol. 2016;5;4466-9.
13. Kumar R, Bansal R, Shergill HK, Garg P. Prevalence of thyroid dysfunction in pregnancy and its association with feto-maternal outcomes: A prospective observational study from a tertiary care institute in Northern India. Clin Epidemiol Glo Heal. 2023;19:101201.

**Cite this article as:** Popli S, Shreshta J, Dath SS, Sharma M. Fetomaternal outcome in pregnant women with derranged thyroid function. Int J Reprod Contracept Obstet Gynecol 2023;12:1789-92.