

ORIGINAL ARTICLE

Prevalence of Thyroid Disorders in First Trimester of Pregnancy at Kathmandu Model Hospital

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ABSTRACT

Introduction: Thyroid disorder is a common endocrine disorder in pregnancy. The reference range of thyroid function is lower in pregnancy. Optimum thyroid function is required to prevent complications in mother and fetus. Pregnant ladies without symptoms of thyroid disorder may have abnormal value. This study was done to find the prevalence of thyroid disorder in pregnant ladies attending Kathmandu Model Hospital in first trimester.

Methods: This was an observational study of pregnant ladies who attended Obstetrics and Gynecology Department of Kathmandu Model Hospital from September 2021 to February 2022. Pregnant ladies in first trimester with singleton pregnancy without history of thyroid disorder were included in the study. Thyroid function test (TFT) was done after obtaining consent. Data were collected and analyzed.

Results: A total of 488 pregnant ladies were included in the study. Thirty-seven (7.58%) pregnant ladies had abnormal result, out of which 34 (6.96%) had subclinical hypothyroidism (SCH).

Conclusion: Subclinical hypothyroidism was high in the present study and BMI was not associated as risk factor.

Keywords: Hypothyroidism, Subclinical hypothyroidism, Hyperthyroidism

INTRODUCTION

Thyroid disorder is challenging to diagnose in pregnancy as symptoms and physiological changes mimic thyroid dysfunction. In pregnancy slightly decrease in TSH and increase in free T4 occurs in first trimester due to human chorionic gonadotrophin.¹ Maternal T3 and TSH do not cross the placenta. In first trimester fetus is completely dependent on maternal T4 for brain development.^{2,3} Thirty percent of thyroxine in fetus at term is maternal.¹ The non-pregnant range of TSH (0.4-4.0 mIU/L) might wrongly diagnose pregnant as euthyroid. Serum TSH above 2.5 mIU/L in first trimester, 3 mIU/L in second and third trimester and <0.1mIU/L indicate thyroid dysfunction.⁴

The prevalence of overt hypothyroidism is 0.3 -1%, subclinical hypothyroidism (SCH) is 2-5% and hyperthyroidism is 0.2% in pregnancy.⁵ Thyroid disorder may cause subfertility, abortion, anemia, gestational hypertension, heart failure, placenta abruption, postpartum hemorrhage thyroid storm, preterm birth, growth restriction, neonatal respiratory distress, perinatal mortality and cretinism.^{1,6,7} This study was done to find out the prevalence of thyroid dysfunction in pregnant ladies attending our hospital.

METHODS

This was an observational study on pregnant ladies who attended Obstetrics and Gynecology Department

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of Kathmandu Model Hospital from September 17th 2021 to February 12th 2022. Approval was obtained from Institutional Review Committee. Pregnant ladies in first trimester with singleton pregnancy without history of thyroid disorder and diabetes were included in the study. Consent was obtained. Blood sugar random was done to exclude diabetes. Three ml blood was drawn from each and thyroid function test was done in ECIQ machine by Enhanced chemi-luminescence immunoassay. Normal range for FT3 is 2.77-5.77 pg/ml, FT4 0.78-2.19 ng/ml and TSH is 0.46-4.68 micro-IU/ml. Data were collected in proforma, transferred to excel master chart and analyzed.

RESULTS

There were 488 pregnant ladies in first trimester. None of them were diabetic. Eleven pregnant ladies with hypothyroid and one hyperthyroid under treatment were excluded from the study. So, the study population was 476 and 439 (89.96%) were euthyroid. Thirty-seven (7.77%) had abnormal thyroid function, out of which thirty-four (7.14%) had SCH, two (0.42%) had overt hypothyroidism and one (0.21%) had overt hyperthyroidism (Figure 1).

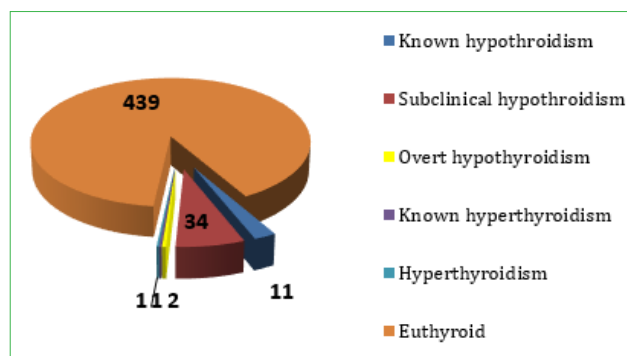


Figure 1. Distribution of pregnant ladies with thyroid disorders

The median age of pregnant ladies with thyroid dysfunction was 32.25 years and majority of them twenty-five (67.57%) had normal BMI, twenty-six (70.27%) were primigravida and eleven (29.73%) were multigravida. Six (16.22%) pregnant ladies with thyroid dysfunction had history of spontaneous abortion and nine (24.32%) had history of subfertility (Table 1).

Table 1. Baseline characteristics of pregnant ladies with thyroid disorder (n=37).

Age in years	Number
20-24	2 (5.41%)
25-29	15 (40.54%)
30-34	16 (43.24%)
35-40	4 (10.81%)
Median age (in years)	32.25
BMI	
<18.5 (underweight)	3 (8.11%)
18.5-24.9 (normal weight)	25 (67.57%)
25-29.9 (over weight)	6 (16.22%)
>30 (obese)	3 (8.11%)
H/O abortion	6 (16.22%)
H/O subfertility	9 (24.32%)
Gravida	
Primi	26 (70.27%)
Multi	11 (29.73%)
Gestational weeks	
5 weeks	11 (29.73%)
6 weeks	16 (43.24%)
7 weeks	3 (8.11%)
8 weeks	5 (13.51%)
11 weeks	2 (5.41%)

TSH values of pregnant ladies with abnormal value are shown in Table 2.

Table 2. TSH value of pregnant ladies with thyroid disorder (n=37).

TSH value (micro-IU/ml)	Number
>2.5 - <4.6	12 (32.43%)
>4.6 - <10	22 (59.46%)
>12	2 (5.41%)
<0.015	1 (2.70%)

DISCUSSION

There is increased risk of maternal and fetal complications in cases of untreated thyroid dysfunction in pregnancy. The epidemiological data of thyroid disorder in Nepal is not available.⁸

In the present study 89.96% were euthyroid. Thirty-seven (7.77%) had abnormal thyroid function, out of which 37.14% had SCH, 0.42% had overt hypothyroidism and 0.21% had overt hyperthyroidism. A study from tertiary care hospital from Nepal, the prevalence of thyroid disorder was 24.62%, SCH 19.75%, overt Hypothyroid 2.43%, subclinical hyperthyroid 0.6% and overt hyperthyroid 0.6%. Their sample size was 329, but they screened in all trimester of pregnancy.⁹ Study by Upadhyay from Nepal showed 13% had overt hypothyroid and 31% had SCH. This study had small sample size of 107 and screening was not trimester specific.¹⁰ In another study of screening of pregnant women from a tertiary care hospital from Kathmandu 71% were euthyroid, total 25.7% hypothyroid, 25.2% SCH, 0.5% overt hypothyroid, total 3.3% hyperthyroid and 0.7% were overt hyperthyroid. This study had sample size of 420 which is comparable to present study and the percentage of overt hypothyroid and hyperthyroid is comparable although they had high prevalence of SCH. They screened all pregnant ladies in first trimester.¹¹ A study from Pakistan including five hundred early pregnancy showed 1.6% SCH, 1% overt hypothyroidism, 1.2% overt hyperthyroid and 6% known hypothyroid.¹²

In a study from Bangladesh by Ferdousi et al pregnant ladies in < 13 weeks of gestation 89% were euthyroid which is similar to the present study. The study showed 11% were hypothyroid but did not further classify as SCH and overt hypothyroid. Further there were 2.3% diabetic ladies. Our study excluded known diabetes. They performed TSH first for screening and if abnormal then T3 and T4 were done.¹³ This may be due to economic burden. In the present study T3, T4 and TSH were done for screening initially. Another study from tertiary care hospital from Bangladesh showed 77.55% euthyroid, 14.17% SCH, 6.68% hyperthyroid that is different from our study. They also performed only TSH as screening and if found abnormal then T3, T4 and TPO Ab were done.¹⁴ In our study TPO Ab was not done in case of abnormal TFT result. In women with TPO Ab there is four-fold increase in risk of abortion.¹⁵ TPO Antibody is associated with increased

risk of preterm delivery and postpartum thyroiditis.^{16,17}

In all the studies hypothyroidism was prevalent. Nutritional factor may be one of the risk factors for hypothyroidism in Nepal.^{18,19} Some study showed overweight and obesity are risk factors for hypothyroidism.¹² In the present study majority (67.56%) had normal BMI, 16.22% were overweight, 8.11% were underweight and 8.11% were overweight. In the study from Pakistan they did not find link between BMI and SCH.¹²

In Nepal, as in most of the countries there is no National recommendation of universal screening of Thyroid function in pregnancy but screening of high-risk group is recommended.⁸ WHO, Pakistan and Indian endocrine society recommend screening of high-risk group. Indian Thyroid Society recommends screening of TSH level in all pregnant ladies at first visit ideally evaluation as soon as pregnancy is confirmed.²⁰

CONCLUSION

Subclinical hypothyroidism was high in the present study and Body Mass Index (BMI) was not associated as risk factor.

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