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Original Research Article

Prevalence of sub clinical hypothyroidism and pregnancy outcome: a prospective comparative study

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ABSTRACT

Background: In pregnancy, subclinical hypothyroidism is more common than overt hypothyroidism, ranging from 15% to 28% in Iodine sufficient region. Evidence suggests that subclinical hypothyroidism is associated with adverse pregnancy outcome. The aim of this study was to find the prevalence of subclinical hypothyroidism in pregnant women and adverse pregnancy outcome.

Methods: This hospital based prospective comparative study was conducted over a period of 6 months from 1st July 2018 to 31st December 2018 in department of obstetrics and gynecology SKIMS Soura Kashmir. All the subjects who fulfilled the inclusion criteria and who consented to participate were screened for subclinical hypothyroidism.

Results: A total of 175 pregnant women participated in the study and subclinical hypothyroidism was diagnosed in 25 pregnant women (14.2%). Most of our patients were in age group 21 to 30 years (69.1%). Pregnant women with subclinical hypothyroidism had significant risk of preeclampsia (35%) and higher cesarean section rate (29.6%). Neonate of women with subclinical hypothyroidism had higher incidence poor Apgar score, NICU admission.

Conclusions: The prevalence of subclinical hypothyroidism is high in pregnant women and the gravity of the complications like pre-eclampsia, neonate with low Apgar score, increased NICU admission, overweight the cost of screening. In this view, we propose screening of all pregnant women in the first trimester for diagnosis.

Keywords: Fetal outcome, Maternal outcome, Prevalence, Subclinical hypothyroidism

INTRODUCTION

Subclinical hypothyroidism (SCH) is the commonest form of hypothyroidism in pregnancy. SCH is defined by a normal free thyroxine in the presence of an elevated thyroid stimulating hormone (TSH).¹ Recently, the normal range TSH during pregnancy was redefined to an upper limit of 2.5 mIU/L during the first trimester and 3.0 mIU/L during the second and third trimester.²

Applying the current diagnostic criteria, 15% of pregnant women in the United States have SCH, a fivefold increase in the prevalence of SCH.³ The effects of subclinical hypothyroidism in pregnancy include

increased incidence of premature birth, placental abruption, low birth weight, low Apgar score, increased need for caesarean, hypertension in mothers increased neonatal mortality and neuropsychiatric abnormalities in children.^{4,5} In comparison with overt hypothyroidism where there is clear evidence for adverse events, the impact of SCH on pregnancy is unclear.⁶ There have been numerous retrospective studies reporting associations between SCH And adverse pregnancy outcome, however, the data is inconsistent, with many studies failing to demonstrate an adverse effect from untreated SCH in India. Hence this study was undertaken to estimate the prevalence of SCH and find out the pregnancy outcome in women with SCH.

METHODS

This is hospital-based prospective comparative study conducted from 1st July 2018 to 31st December 2018 in department of obstetrics and gynecology SKIMS Soura Kashmir. After obtaining informed consent, a total number of 175 pregnant women were selected during the study period. A minimum Sample size of 169.2 was calculated with an anticipated prevalence of subclinical hypothyroidism during pregnancy in females of Kashmir, India was 12.6% women.⁸ Using the statistical formula.

$$n = z^2 p(1-p)/e^2$$

n = Sample size, z = level of confidence of 95% (1.96), p = prevalence (11 %), e = margin of error (5%). Thyroid profile (TSH, FT4 and FT3) was done during their first visit and in subsequent trimester based on inclusion and exclusion criteria

Inclusion criteria

- TSH > 2.5 mIU/l in 1st trimester
- TSH > 3 mIU/l in 2nd and 3rd trimester
- Normal FT4 and FT3.

Exclusion criteria

- Pre-existing thyroid disorder
- Other medical problem like chronic hypertension, seizure disorder, T2DM etc.

The study population was divided into two groups, case and control. All the patients were followed up for maternal complications (pregnancy induced hypertension,

Anemia), fetal complications (preterm birth), mode of delivery (vaginal, caesarean) and neonatal complications (Apgar score at 1 min. and NICU admission).

Statistical analysis

After collecting data in prescribed form, data entry and analysis was done using SPSS vs 20 program. Chi-square test and other appropriate statistical test were done. P-value less than 0.05 were considered statistically significant.

RESULTS

Out of 175 pregnant women, subclinical hypothyroidism was diagnosed in 25 pregnant women. The prevalence of SCH in the study population was (14.2%) as shown in Table 1.

Most of our patients were in the age group of 21-30 years (69.1%). In the study group 11.1% of SCH women belonged to age group ≤20 years, 12.4% belonged to age group 21-30 years and 22.2% belonged to age group 31-40 years. Incidence of SCH increases as the age increases but the relation was statistically insignificant. The p value was > 0.05 (Table 2).

Table 1: Distribution of subclinical hypothyroidism in study subject.

Distribution of subclinical hypothyroidism subjects by	No. of study subjects
Present	25 (14.3%)
Absent	150 (85.7%)
Total	175 (100%)

Table 2: Distribution of subclinical hypothyroidism by age.

Subclinical hypothyroidism	≤ 20 years	21-30 years	31-40 years	Total	p value
Present	02 (11.1%)	15 (12.4%)	08 (22.2%)	25 (14.3%)	0.30
Absent	16 (88.9%)	106 (87.6%)	28 (77.8%)	150 (85.7%)	
Total	18 (10.2%)	121 (69.1%)	36 (20.5%)	175 (100%)	

Chi-Square value: 2.35; degree of freedom: 2.

Table 3: Distribution of subclinical hypothyroidism by haemoglobin levels.

Haemoglobin level	Sub clinical hypothyroidism		Total	p value
	Present	Absent		
< 10 g/ dl	6 (13%)	40 (87%)	46 (100%)	0.96
10-10.9 g/dl	8 (14.8%)	46 (85.2%)	54 (100%)	
11 g/dl or more	11 (14.7%)	64 (85.3%)	75 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 0.079; degree of freedom: 1.

WHO has defined hemoglobin of less than 11 gm% as anemia in pregnancy. In our study pregnant women with SCH 14 (14%) cases had anemia compared to patient

without SCH 68 (68%). The difference was statistically insignificant, p value is > 0.05 (Table 3). Compared with euthyroid pregnant women, pregnant women with SCH

had a higher risk of preeclampsia. The p value is < 0.05 . The relation was statistically significant (Table 4).

Risk of prematurity was more in SCH patient than euthyroid pregnant women (Table 5). The relation was statistically insignificant. The p value was > 0.5 .

In our study normal delivery occurred in 9 (7.4%), caesarean deliveries in 16 (29.6%) and as compared to euthyroid pregnant women in whom normal deliveries were 112 (92.6%), caesarean deliveries in 38 (70.4%) (Table 6). This observation was statistically significant with a p value of < 0.05 .

Table 4: Distribution of subclinical hypothyroidism by preeclampsia.

Preeclampsia	Subclinical hypothyroidism		Total	p value
	Present	Absent		
Yes	7 (35%)	13 (65%)	20 (100%)	0.004
No	18 (11.6%)	137 (88.4%)	155 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 7.91; degree of freedom: 1.

Table 5: Distribution of subclinical hypothyroidism by prematurity.

Prematurity	Subclinical hypothyroidism		Total	p value
	Present	Absent		
Yes	3 (20%)	12 (80%)	15 (100%)	0.5083
No	22 (13.7%)	138 (86.3%)	160 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 7.91; degree of freedom: 1.

Table 6: Distribution of subclinical hypothyroidism subjects by mode of delivery.

Mode of delivery	Subclinical hypothyroidism		Total	p value
	Present	Absent		
FTND	9 (7.4%)	112 (92.6%)	121 (100%)	0.0000
LSCS	16 (29.6%)	38 (70.4%)	54 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 15.01; degree of freedom: 1.

Table 7: Distribution of subclinical hypothyroidism by birth weight.

Birth weight	Subclinical hypothyroidism		Total	p value
	Present	Absent		
1500-1999g	2 (13.3%)	13 (86.7%)	15 (100%)	0.5032
2000-2400	7 (20.6%)	27 (79.4%)	34 (100%)	
2400-or more	16 (12.7%)	110 (87.3%)	126 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 1.373; degree of freedom: 2.

Table 8: Distribution of subclinical hypothyroidism by Apgar score.

Apgar score at 1 min	Subclinical hypothyroidism		Total	p value
	Present	Absent		
< 7	5 (62.5%)	3 (27.5%)	8 (100%)	0.00000
7 or more	20 (12%)	147 (88%)	167 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 15.91; degree of freedom: 1.

The incidence of LBW 1.5-1.999 kg and 2.0-2.4 kg was 2 (13.3%) and 7 (20.6%) in SCH patient as compared to 13

(86.7%) and 27 (79.4%) in euthyroid patients. The relation was statistically insignificant (Table 7).

Low Apgar score was more in SCH patient than euthyroid patients with incidence of 62.5% (Table 8). p value was < 0.05. The relation was statistically significant.

NICU admission was more in babies born to SCH patients than euthyroid pregnant women with incidence of 66.7% (Table 9). p value was < 0.05. The relation was statistically significant.

Table 9: Distribution of subclinical hypothyroidism by NICU admission.

NICU admission	Subclinical hypothyroidism		Total	p value
	Present	Absent		
Yes	4 (66.7%)	2 (33.3%)	6 (100%)	0.00008
No	21 (30.4%)	148 (87.6%)	169 (100%)	
Total	25 (14.3%)	150 (85.7%)	175 (100%)	

Chi-Square value: 13.92; degree of freedom: 1.

DISCUSSION

The study was done to find out the prevalence and pregnancy outcome in patients with subclinical hypothyroidism in department of obstetrics and gynecology Maternity Hospital, Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Soura, Srinagar, J&K, India. The study was conducted in 175 patients taken by simple random sampling. All the subjects who fulfilled the inclusion criteria and who consented to participate were screened for subclinical hypothyroidism. Out of 175 pregnant women, subclinical hypothyroidism was diagnosed in 25 pregnant women. The prevalence of SCH in our study population was (14.2%) which was comparable to study done by Mukhtar B et al (12.6%).⁷ Most of our patients were in the age group of 18-40 years (69.1%). The age group selected by Ablovich et al, was again in range of 16-39 years, which is in concordance with our studied population.⁸ In the study group 11.1% of SCH pregnant women belonged to age group ≤ 20 years, 12.4% belonged to age group 21-30 years and 22.2% belonged to age group 31-40 years. Incidence of SCH increases as the age increased but the relation was statistically insignificant. Similar association was seen in the study done by Potlukova E et al.⁹ The incidence of anemia in pregnant women with subclinical hypothyroidism was less as compared to euthyroid patient. Difference was statistically insignificant. Similar association had been seen in study done by Sannaboraiah A et al, compared with euthyroid pregnant women, pregnant women with SCH had a higher risk of preeclampsia.¹⁰ The relation was statistically significant. A similar association has been found in the study done by Wilson et al, there was a statistically significant association between thyroid disorders and the risk of PIH, mild to severe pre-eclampsia.¹¹ Risk of prematurity was more in SCH patient than euthyroid pregnant women but the relation was statistically insignificant. Same was seen in study done by Sannaboraiah A et al.¹⁰ In our study caesarean deliveries was significantly higher in SCH pregnant women compared to euthyroid pregnant women. This observation was statistically significant. Sannaboraiah A et al had shown similar results i.e.,

cesarean section rate was statistically higher among pregnant women with subclinical hypothyroidism.¹⁰ The incidence of LBW was less in SCH pregnant patient compared to euthyroid patients. The relation was statistically insignificant. A similar association has been seen in study done by Sharma et al.¹² Neonate with low Apgar score was significantly higher in SCH mothers than euthyroid mothers. A similar association has been seen in study done by Saki F et al.¹³ NICU admission was significantly more in babies born to SCH patients than euthyroid pregnant women. Keeping in mind the high prevalence of subclinical hypothyroidism in our state and considering, as already established, that low maternal thyroxine levels increases incidence of preeclampsia, neonate with low Apgar score, increased NICU admission. Therefore, it becomes mandatory to screen all pregnant women and start with levothyroxine therapy in pregnant females with even slightly raised TSH.

CONCLUSION

The present study has identified that the prevalence of subclinical hypothyroidism in pregnant female was increased and there was significant difference in the development of pre-eclampsia, increased caesarean section rate, neonate of low Apgar score, increased NICU admission between pregnant women having subclinical hypothyroidism and euthyroid pregnant women. It was therefore concluded that thyroid function test should be done in each pregnant women to detect subclinical hypothyroidism so that timely intervention can be done to prevent pregnancy related complications.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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