

Perinatal Outcome in Subclinical Hypothyroidism

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Abstract: Subclinical hypothyroidism is the most commonly encountered endocrinological disorder in pregnancy and it affects normal fetal growth and metabolism. Our study was conducted over a period of one year in 150 singleton pregnancies with gestational age >28 weeks and thyroid function tests were done in them and incidence of subclinical hypothyroidism was noted and its effects on perinatal outcome were noted and compared with euthyroid patients. It was concluded that incidence of intrauterine deaths, fetal prematurity, low birth weight, NICU admissions and perinatal mortality was more in subclinical hypothyroid patients as compared to those with euthyroidism.

1. Introduction

Thyroid gland is essential for normal fetal development regulating growth and metabolism. During pregnancy thyroid disorders are most commonly encountered endocrinopathies with prevalence of hyperthyroidism being 0.5 - 1%, hypothyroidism being 2.5 - 3.0%¹ and subclinical hypothyroidism being 2 - 5%^{2,3}. In India, the prevalence of hypothyroidism during pregnancy is 4.8 - 11%³.

Overt hypothyroidism is defined as an elevated TSH in conjunction with decreased FT4 concentration. Women with TSH levels of 10mIU/ L or above, irrespective of FT4 values are also considered to have overt hypothyroidism. Subclinical hypothyroidism is defined as elevated serum TSH with normal FT4 concentration⁴. It is an established fact that overt hypothyroidism has been associated with pregnancy complications. It has been shown that individuals with subclinical hypothyroidism have impaired endothelial vasodilation from diminished nitric oxide secretion which may result in pregnancy complications⁵. But subclinical hypothyroidism has still to be conclusively defined as a risk factor for adverse maternal and fetal outcome.

2. Materials and Methods

This study was a prospective, observational study conducted in Lal Ded hospital over period of one year from march 2021 to march 2022 in a total of 150 patients with singleton pregnancies with gestational age \geq 28 weeks. After taking an informed consent, these patients underwent a comprehensive medical evaluation with complete history, physical examination, baseline investigations. They were subjected to

thyroid function tests (TFTs). Those with increased serum TSH (>4.04 mIU/ml) and normal free serum thyroxine (FT4) levels (0.5 - 0.8ng/dl) were diagnosed as cases of subclinical hypothyroidism. The prevalence of subclinical hypothyroidism in the study population was noted and perinatal outcome was assessed.

Parameters that were studied:

The study population was divided into two groups, those with and those without subclinical hypothyroidism. Perinatal outcome in both the groups was studied in terms of:

- Prematurity – when birth occurs before 34 weeks of gestation.
- Intrauterine death (IUD)
- Birth weight – low birth weight is classified as neonatal weight less than 2500 grams at birth.
- Immediate NICU admission
- Perinatal death – death occurring after 28 weeks of gestation and before completion of 7 days of delivery.

3. Observations & Results

Table 1: Age distribution of study patients

Age (years)	Frequency	Percentage
15 - 24	40	26.67
25 - 34	88	58.67
35 - 44	22	14.66
Total	150	100
Mean \pm SD (Range) = 28.35 \pm 5.68		

Majority of the patients (58.6%) were in the age group of 25 to 34 years.

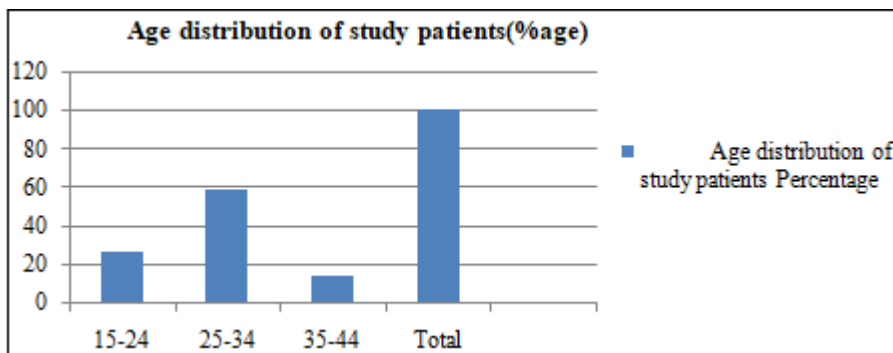


Table 2: Distribution of study population as per thyroid status

Thyroid status	Frequency	Percentage
Euthyroidism	76	50.6
Subclinical Hypothyroidism	40	26.7
Overt Hypothyroidism on treatment	20	13.3
Overt Hypothyroidism not on treatment	11	7.4
Hyperthyroidism	3	2.0
Total	150	100

Out of total 150 patients almost half of the patients (50.6%) were euthyroid, 26.7% had subclinical hypothyroidism.

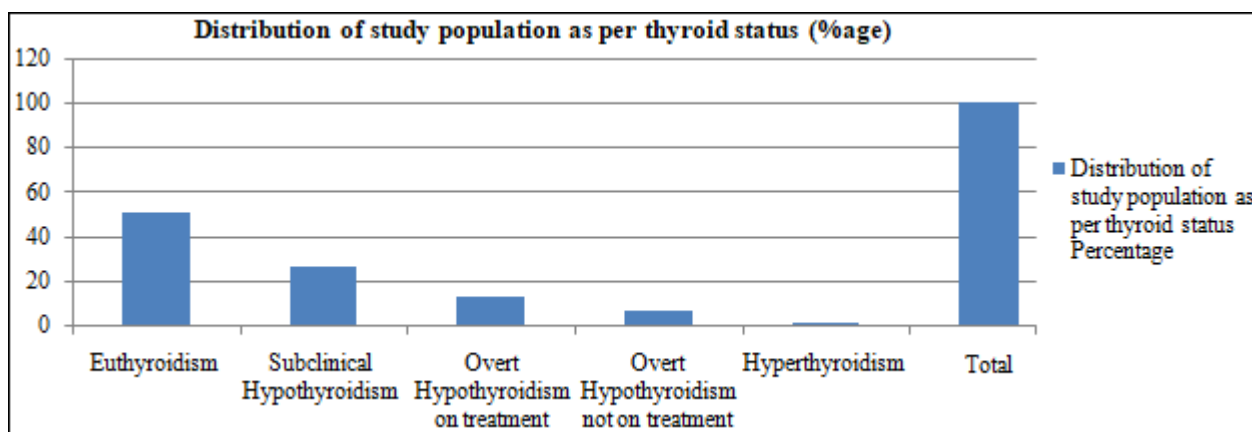


Table 3: Perinatal outcome in the study population

Perinatal outcome	Frequency	Percentage
Prematurity	47	31.34
Intrauterine death (IUD)	20	13.34
Low birth weight	34	22.67
NICU admissions	38	25.34
Perinatal deaths	12	8.00

Out of the total 150 patients in the study population, 20 patients had intrauterine death of their babies, 47 patients had preterm delivery, 34 babies were low birth weight, 38 babies were admitted in NICU out of which 12 babies died in perinatal period.

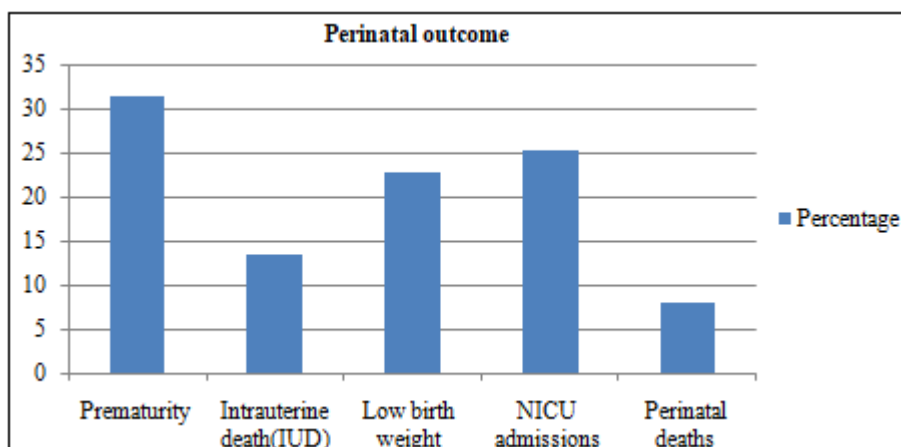


Table 4

Incidence of intrauterine deaths (IUD) in subclinical hypothyroidism vs Euthyroidism				
Intrauterine death	Subclinical hypothyroidism		Euthyroidism	
	Number	%age	Number	%age
Yes	15	37.5	14	18.4
No	25	62.5	62	81.6
Total	40	100	76	100

p - value =0.013

In cases with subclinical hypothyroidism, 37.5% had an intrauterine death, while as only 18.4% of euthyroid cases had an intrauterine death. The p value was statistically significant, thus depicting higher occurrence of intrauterine deaths in subclinical hypothyroid patients as compared to those with euthyroidism.

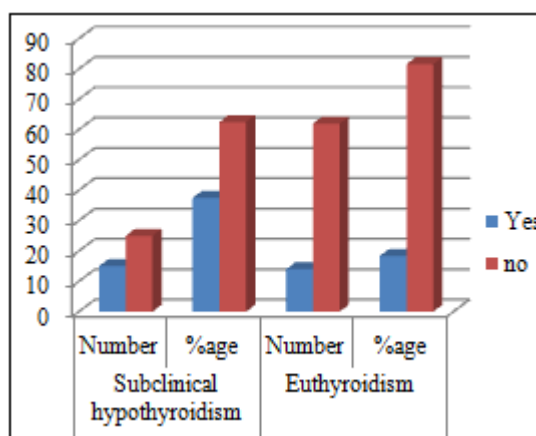


Table 5: Incidence of fetal prematurity in subclinical hypothyroidism vs Euthyroidism

Fetal prematurity	Subclinical hypothyroidism		Euthyroidism	
	Number	%age	Number	%age
Yes	27	67.5	31	40.7
No	13	32.5	45	59.3
Total	40	100	76	100

p - value =0.003

In our study, 67.5% of patients with subclinical hypothyroidism gave birth to premature babies whereas in euthyroid women 40.7% gave birth to premature babies. Thus the risk of prematurity was higher in babies of subclinical hypothyroid women as compared to babies of euthyroid women. The p - value was statistically significant.

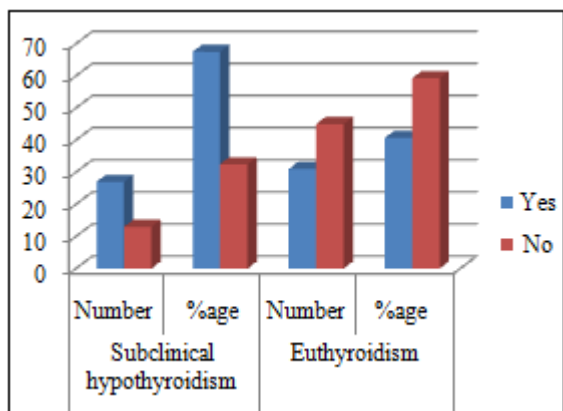


Table 6: Incidence of low birth weight babies in subclinical hypothyroidism vs Euthyroidism

Low Birth Weight babies	Subclinical Hypothyroidism		Euthyroidism	
	No	%age	No	%age
Yes	13	32.5	15	19.7
No	27	67.5	61	81.3
Total	40	100	76	100

p - value= 0.033

The results showed that 32.5% of the subclinically hypothyroid women gave birth to low birth weight babies (LBW), while 19.7% of the euthyroid women among study population gave birth to low birth weight babies. The p - value was statistically significant thus inferring that incidence of low birth weight babies was more among women with subclinical hypothyroidism than in women with euthyroidism.

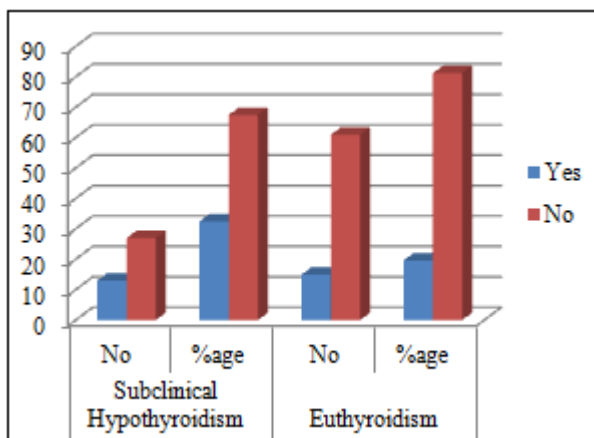


Table 7: Incidence of NICU admission of newborns in subclinical hypothyroidism vs euthyroidism

NICU Admissions	Subclinical Hypothyroidism		Euthyroidism	
	No	%age	No	%age
Yes	11	27.5	10	13.2
No	29	72.5	66	86.8
Total	40	100	76	100

p - value =0.043

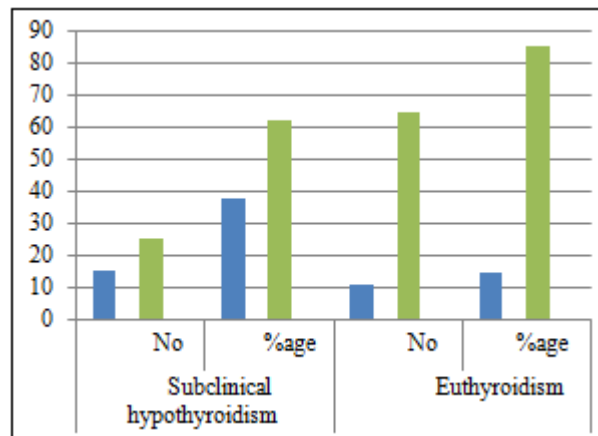
Babies of 27.5% of the subclinically hypothyroid women needed neonatal intensive care unit (NICU) admission, while as babies of 13.2% of the euthyroid women among study participants needed NICU admission thus depicting the higher need of NICU admission among newborns of women with subclinical hypothyroidism with statistically significant p value.

Table 8: Incidence of perinatal mortality in subclinical hypothyroidism vs Euthyroidism

Perinatal mortality	Subclinical hypothyroidism		Euthyroidism	
	No	%age	No	%age
Yes	15	37.5	11	14.5
No	25	62.5	65	85.5
Total	40	100	76	100

p - value=0.004

In subclinically hypothyroid women, 37.5% of the babies died in the perinatal period, while babies of 14.5% of the euthyroid women among study population died in the perinatal period. The incidence of perinatal mortality is higher among patients with subclinical hypothyroidism than in women with Euthyroidism with a significant p - value.



4. Discussion

In our prospective observational study conducted over one year, the mean age of patients was 25 to 34 years and out of total 150 patients, 50.6% were euthyroid whereas 26.7% had subclinical hypothyroidism. In our study the incidence of intrauterine death was significantly more in subclinical hypothyroidism group as compared to euthyroid group which is similar to the results of study conducted by Pavanaganga et al (2014) ⁶. The results of our study showed that incidence of fetal prematurity was more in subclinical hypothyroid group as compared to euthyroid group. These findings are consistent with the findings of the study conducted by Casey BM et al (2005) ⁷. In our study, low birth weight babies were seen more in subclinical

hypothyroid group as compared to euthyroid group which were comparable to the results of study conducted by **Ajmani SN et al (2014)** ⁸. As per the results of our study, the incidence of NICU admissions was more in newborns of subclinical hypothyroid group as compared to euthyroid group which were consistent with results of study conducted by **Casey BM et al (2005)** ⁷. The results of our study also showed that incidence of perinatal mortality was higher in subclinical hypothyroidism group than in those with euthyroidism which were consistent with the results of study conducted by **van den Boogaard E (2011)**.⁹

5. Conclusions

From the results of our study it was concluded that subclinical hypothyroidism is significantly associated with adverse perinatal outcomes like intrauterine death, fetal prematurity, low birth weight, NICU admission and perinatal mortality. All antenatal women should be screened for thyroid function tests, however more clinical trials need to be conducted to prove beneficial effects of therapy in subclinical hypothyroidism.

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