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Subclinical Hypothyroidism and Pregnancy Outcomes.

Sunil Kumar Lahoti[1], Leelabati Toppo[1]

[1]Assistant professor, Department of General Medicine, Mallareddy Medical College for Women, Hyderabad, India.

ABSTRACT

Background: Clinical thyroid dysfunction has been associated with pregnancy complications such as hypertension, preterm birth, low birth weight, placental abruption, and fetal death. As this relationship between subclinical hypothyroidism and pregnancy outcomes has not been well studied, we have undertaken his study. **Methods:** 2139 women who came for check up and delivered in our hospital were included in the study. Regular tests were done including thyroid profile (T3, T4, and TSH). **Results:** 51 patients showed the presence of subclinical hypothyroidism. There was two to three fold increase of complications like Gestational diabetes, and gestational hypertension, placental abruption, PROM, Preterm delivery. Two fold increase in the incidence of fetal distress, low birth weight; IUGR and fetal death were also observed. **Conclusion:** As there is a risk to the mother and child in the presence of Subclinical Hypothyroidism (SCH), T4 and TSH levels for the mother must be at all the trimesters so as to timely treatment can be done.

***KeyWords*:** Subclinical hypothyroism, Pregnancy.

INTRODUCTION

Thyroid hormones are required for normal metabolism, regulation of body temperature, energy production and fetal development.[1,2] Thyroid dysfunction is the second most frequent endocrine diseases among reproductive-aged women.[3] Maternal thyroxin is critical in the early stages of pregnancy as the thyroid gland in the fetus is not developed enough to synthesize iodothyronines. These develop only after 10 weeks of gestation. Only from this time onwards, both maternal and fetal thyroid hormones are required for normal neurodevelopment.[4] In case of thyroid insufficiency, whether maternal or foetal caused by severe iodine deficiency, the infant is prone to neurologic impairment and mental retardation.[5,6]

Hypothyroidism can be overt or subclinical overt hypothyroidism is characterized by an elevated serum level of thyroid stimulating hormone (TSH>10 mIU/L) and a subnormal free thyroxine (fT4) level, whereas subclinical hypothyroidism (SCH) is characterized by an enhanced TSH level, usually beyond the upper reference limit, and a normal fT4 level.[7,8]

Most of the patients are asymptomatic. Clinical symptoms when present in the pregnant women are same as those in non pregnant women and may include fatigue, cold intolerance, constipation, and weight gain. Much are these are also consequences of pregnancy and may be overlooked.

Name & Address of Corresponding Author
Dr. Leelabati Toppo
Assistant professor, Department of General Medicine,
Mallareddy Medical College for Women,
Hyderabad, India.
Email: leelavati.toppo@gmail.com

Untreated subclinical hypothyroidism may lead to various complications in pregnancy like hypertension, preterm birth, low birth weight, placental abruption, and fetal death.

The prevalence of SCH could be anticipated to be between 2% and 5% of women screened, depending on the TSH and free T4 (FT4) level thresholds applied and this represents most women who would be identified with thyroid deficiency through routine screening.

In west, the prevalence of hypothyroidism is estimated to be 2-3% and 0.3-0.5% for subclinical and overt hypothyroidism respectively.[9-11] In India, the prevalence ranges from 4.8% to 11%.[12,13] It seems that prevalence of hypothyroidism is more in Asian countries compared with the West.[10]

This study was performed in an attempt to identify the association between subclinical hypothyroidism with the outcomes in pregnancy, both to mother and child.

MATERIALS AND METHODS

This prospective study was performed in Mallareddy Medical College for Women during the period of Nov-2012 to May-2015. 2139 pregnant ladies who attended the Obstetrics OPD and delivered in our hospital were included in the study. Women who came in only for delivery and those, who delivered elsewhere or who could not be followed up were excluded from the study. Blood was collected from the patients for estimation of thyroid levels by electrochemiluminescence immunoassay in all the three trimesters. The levels were correlated with the corresponding normal levels. Patients with normal thyroid levels were taken as controls.

General demographic details like age, occupation, income of the patient and familial income, medical

history like menstrual history, LMP, any diseases, present or past, habits such as smoking and alcoholism were taken. Other general characters like weight, body mass index, blood pressure, fetal heartbeat, edema, fundal height, abdominal girth, etc were done. Pelvic exam and scanning were done necessary.

Routine laboratory tests were done to rule out Gestational Diabetes, HIV, HBV, HCV, Syphilis. Other routine tests for liver function, renal function, ECG, Complete Urine Examination, Complete Blood picture, Hemoglobin levels etc were performed.

RESULTS

Of the 2139 patients studied, 111 (5.2%) were found to have subclinical hypothyroidism [Figure 1]. The average age of the patients where similar in normal and patients with subclinical hypothyroidism [Table 1].

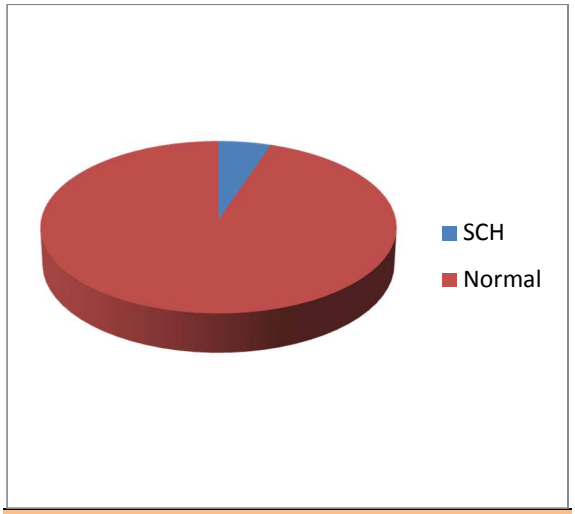

Figure 1: Subclinical Hypothyroidism Vs Normal

Table 1: Normal versus subclinical hypothyroidism mothers.

Variables	Normal mothers (N=2028)	Mothers with subclinical hypothyroidism (N=111)
Age of Mother (Yrs)	21.4 +/- 1.7	22.3 +/- 1.2
Type of delivery		
Vaginal	1359 (67%)	72 (64.9%)
Forceps	134 (6.6%)	11 (9.9%)
Cesarean	535 (26.4%)	28 (25.5%)
Exposure to smoking	1239 (61.3%)	80 (72.1%)
Gestational age (Mean)	38.7 weeks	36.2 weeks

Table: 2 Maternal complications

Complications	Normal Mothers N=2028	Mothers with SCH N = 111
Gestational hypertension	55 (2.7%)	11 (9.8%)
Placental Abruption	7 (0.35%)	2 (1.8%)
Preterm birth	63 (3.1%)	8 (7.2%)
Prelabour rupture of membranes	87 (4.3%)	12 (10.8%)
Gestational diabetes	28 (1.4%)	3 (2.7%)

Table: 3: Fetal complications

Fetal complications	Normal Mothers (N=2028)	Mothers with SCH (N = 111)
Fetal distress	34 (1.7%)	4 (3.6%)
LBW	41 (2.0%)	6 (5.5%)
IUGR	14 (0.7%)	3 (2.7%)
Fetal death	4 (0.2%)	2 (1.8%)

The incidence of complications in the mother and the fetus was two or three fold higher in the subclinical hypothyroid affected mothers in comparison to mothers without hypothyroidism. [Table 2 & 3].

DISCUSSION

Thyroid dysfunction is one of the most common disorders seen in pregnancy. Reports have associated thyroid deficiency in pregnancy with impaired neurodevelopment of the offspring, preterm delivery, pre-eclampsia and post partum thyroiditis.[14,15] This had lead to a great interest in the study of the thyroid levels in pregnancy.[10]

Our study shows the prevalence of 5.2% of Subclinical hypothyroidism in pregnant women. In a similar study in China, the prevalence of hypothyroidism was comparatively higher in high risk group (10%) than non high risk group (7%). In North India a higher prevalence of 14.3%, most of it being of subclinical in pregnant women were reported by Dhanwal et al.[16]

The maternal age in our study was around 22 years while in western countries studies have reported the age to be around 27 years[17], showing probably an early marriage in India. Few other studies corroborate this early age of child bearing.[18]

Among the complications, our study showed most of them were 2-3 times more than normal mothers. Gestational hypertension was almost 4 times more in SCH mothers rather than normal mothers. PROM and Placental abruption was almost 3 times more prevalent while gestational diabetes was double.

In a similar study by Chen et al[8], incidence of GH was 1.8% in normal and 3.5% in SCH mothers, PROM 4.97% and 8.6%, GDM 3.74% and 2.15%, preterm delivery 3.5% and 3.504% among normal

and SCH mothers respectively. A significant association between SCH and severe pre-eclampsia was observed by Mohanty et al.[10]

Complications in fetuses were considerably more in mothers who had subclinical hypothyroidism compared to mothers without. Fetal distress was 3.6% in SCH compared to 1.7% in normal, low birth weight 5.t% and 2%, IUGR 2.7% to 0.7% fetal death 1.8% to 0.2%. Study by Liang-Miao Chen, showed similar results.[8] Two fold increase of incidence of preterm birth was also seem by Casey et al in yet another study.[14]

Various studies also showed that there is a considerable risk of developing gestational diabetes when the thyrotropin levels increases.[19] This may progress to overt hypothyroidism in about 2.5% cases annually.[20] Other complications like preeclampsia, eclampsia, hypertension have also been reported to higher in SCH (15%) as compared to normal population (7.9%).[21]

CONCLUSION

The prevalence of SCH in India seems to be considerably higher than other parts of the world. Out study suggests this disease results in various grave complications like eclampsia, preeclampsia, hypertension, gestational diabetes etc in mothers, and fetal distress, intrauterine growth restriction, and also death in the fetus. Neurological disorders and lower IQ have also been reported. As a result it is advisable to screen pregnant women in all the three trimesters for SCH to avoid mother and child complications.

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