



A Study on Thyroid Function in Pregnancy in a Medical College of Odisha

Authors

Dr Poonam Mehta¹, Dr Jyostnarani Patnaik²

¹PG Student, ²Professor & Head

Dept. of Physiology, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha

ABSTRACT

Aim: The aim of this study was to assess the thyroid function among pregnant women in a Medical College Hospital of Odisha.

Methods: A total of 200 healthy, pregnant women within the age of 18-32 years appearing at Gynecology & Obstetrics OPD, Ante-natal clinic and also from indoor wards of Hi-Tech Medical College & Hospital, Odisha were included in this study. Women, who were diagnosed or treated for thyroid dysfunction, aged less than 18 years or more than 32 years, having other endocrinopathies like Diabetes Mellitus, with eclampsia or Pre-eclampsia, with any other pre-existing medical disorders complicating pregnancy, multiple pregnancy, gestational diabetes mellitus were excluded from the study. Serum samples were assayed for TSH, FT₄ and FT₃ levels using ADVIA Centaur® CP Immunoassay System. The TSH value > 4.5 MIU/Lit was considered to be elevated above the normal limit and was regarded as hypothyroidism.

Results: 24% of all pregnant women participating in this study had hypothyroidism and majority (83.33%) of these hypothyroid women had sub-clinical hypothyroidism.

Conclusion: This study concludes that there is a high prevalence of hypothyroidism, majority being subclinical in pregnant women from India. Hence universal screening of hypothyroidism may be desirable in our country.

INTRODUCTION

Pregnancy is associated with significant but reversible changes in thyroid function. Thyroid disorders such as chronic thyroiditis, hypothyroidism, Graves' disease etc. are relatively common in pregnant women. Uncontrolled hyperthyroidism and hypothyroidism are associated with serious maternal, fetal, and neonatal morbidity, and mortality. The aim of this study was to assess the maternal thyroid function among pregnant women in a Medical College Hospital of Odisha.

METHODS

The present study was a prospective cross sectional study conducted in the time period from September 2013 to August 2015. The target population was the pregnant women from Gynecology & Obstetrics OPD, ante-natal clinic and indoor wards of Hi-Tech Medical College & Hospital, Odisha. A total of 200 healthy, pregnant women within the age of 18-32 years appearing at Gynae & Obstetrics OPD, Ante-natal clinic and also from indoor wards of Hi-Tech Medical College & Hospital, Odisha were included in this

study. Women, who were diagnosed or treated for thyroid dysfunction, aged less than 18 years or more than 32 years, having other endocrinopathies like Diabetes Mellitus, with eclampsia or Pre-eclampsia, with any other pre-existing medical disorders complicating pregnancy, multiple pregnancy, gestational diabetes mellitus were excluded from the study.

Personal data (e.g. age, address), number of miscarriages, number of pregnancies, thyroid problems, H/O medication were taken. 5 ml venous blood sample was collected from 200 pregnant women. Blood samples were collected from each individual in the early morning in one EDTA containing vial and one plain vacutainer tube. Serum was separated from whole blood for all specimens in vacutainer using fine centrifugation at 3000 rpm for 15 min. Serum samples were sent to the lab within 2 hours of collection, for analysis. Serum samples were assayed for TSH, FT₄ and FT₃ levels in Hi-tech Medical College Central Lab. The ADVIA Centaur® CP Immunoassay System was used for estimation of TSH, FT₄, FT₃.

RESULTS

The results were as follows:

60 women (30%) were in the age group of 18-20 years, 64 women (32%) were in the age group of 21-23 years, 32 women (16%) were in the age group of 24-26 years, 28 women (14%) were in the age group of 27-29 years and rest 16 women (8%) were in the age group of 30-32 years. (Table 1)

Among 200 pregnant women, 160 (80%) were in first trimester. 28 women (14%) were in second

trimester and rest 12 women (6%) were in the third trimester. (Table 2)

The TSH value > 4.5 MIU/Lit was considered to be elevated above the normal limit and was regarded as hypothyroidism. The values in between 0.5 - 4.5 MIU/Lit was considered as normal euthyroid state and TSH value < 0.5 MIU/Lit was considered to be lower than normal was regarded as hyperthyroid state. Among 200 women, 48 (24%) had their TSH value > 4.5 MIU/Lit and thus considered as hypothyroid. 148 (74%) women had normal TSH level and rest 4(2%) women had their TSH level lower than lower limit of normal reference range. (Table 3 & Chart 1)

Out of these 48 hypothyroid pregnant women (with TSH > 4.5 MIU/Lit), 40 had normal free T₄ level (0.7 – 1.9 ng/ml). They were considered as subclinical hypothyroid. Rest 8 hypothyroid women had free T₄ level lower than lower limit of normal range (< 0.7 ng/ml). Therefore, they were considered as overt hypothyroid. (Table 4 & Chart 2)

Free T₄ level was within normal range (0.7 – 1.9 ng/ml) in 188 pregnant women (94%) out of 200. 8 women (4%) had FT₄ level less than 0.7 ng/ml and rest 4 women (2%) had FT₄ level higher than 1.9 ng/ml. The mean (SD) FT₄ was 1.19 ± 0.84 ng/ml. (Table 5)

Free T₃ level was within normal range (2 – 4.4 pg/ml) in 184 pregnant women (92%) out of 200. 12 women (6%) had FT₃ level less than 2 pg/ml and rest 4 women (2%) had FT₃ level higher than 4.4 pg/ml. The mean (SD) FT₃ was 3.12 ± 0.92 pg/ml. (Table 6)

Table 1: Distribution of age groups in pregnant women

Age Group	18-20 yrs	21-23 yrs	24-26 yrs	27-29 yrs	30-32 yrs
Number (%)	60 (30%)	64 (32%)	32 (16%)	28 (14%)	16 (8%)

Table 2: Trimester wise distribution of pregnant women

Trimester	First Trimester	Second Trimester	Third Trimester
Number (%)	160 (80%)	28 (14%)	12 (6%)

Table 3: Distribution of TSH level in pregnant women

TSH Level (MIU/Lit)	> 4.5	0.5 - 4.5	< 0.5
Number (%)	48 (24%)	148 (74%)	4 (2%)

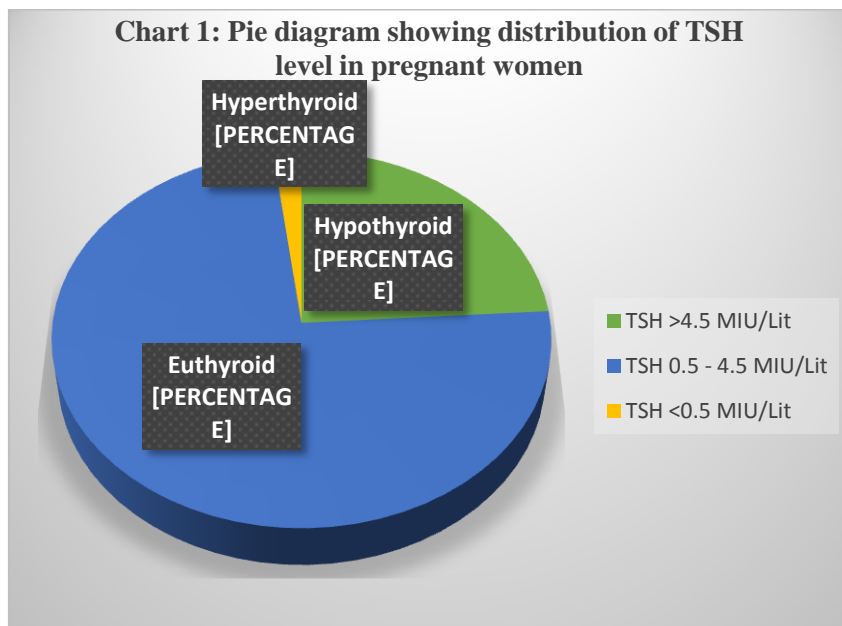


Table 4: Distribution of subclinical & overt hypothyroidism in hypothyroid pregnant women

Total Hypothyroid (TSH > 4.5MIU/Lit)	Subclinical Hypothyroid (Higher TSH, Normal Free T4 level)	Overt Hypothyroid (Higher TSH, lower Free T4 level)
48 (100%)	40 (83%)	8 (17%)

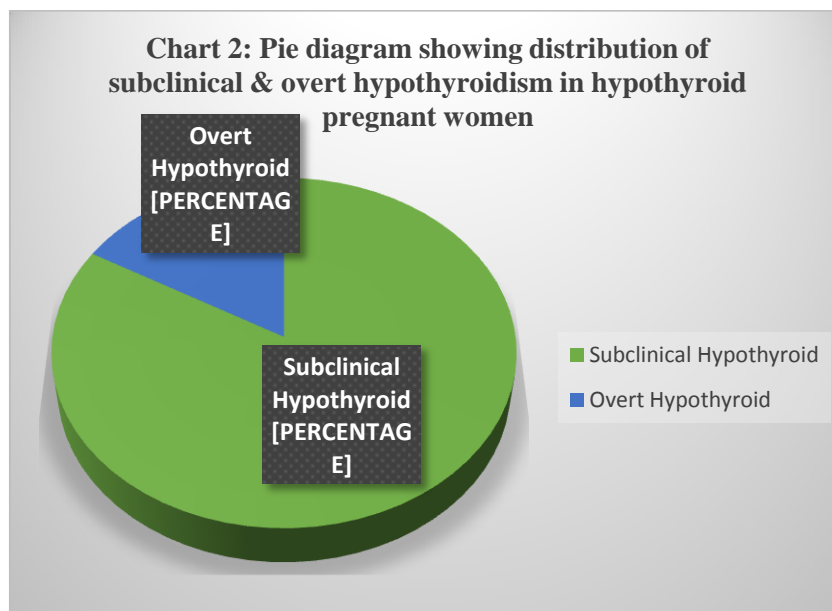


Table 5: Distribution of free T4 level in pregnant women

FT4 Level	<0.7 ng/ml	0.7- 1.9 ng/ml	>1.9 ng/ml
Number (%)	8 (4%)	188 (94%)	4 (2%)

Table 6: Distribution of free T3 level in pregnant women

FT3 Level	<2 pg/ml	2 – 4.4 pg/ml	>4.4 pg/ml
Number (%)	12 (6%)	184 (92%)	4 (2%)

DISCUSSION

There are lot of debates regarding the normal upper limit of TSH in pregnancy. Recent guidelines proposed by the ATA and National Association of Clinical Biochemistry have states that it is likely that in the future the upper limit of the serum TSH euthyroid reference range will be reduced to 2.5 IU/L for all adults⁽¹⁾. However, the American Association of Clinical Endocrinologists & The Endocrine Society consensus panel recommends that 4.5 IU/L be maintained as the upper limit of normal. The reason is that although persons within the range of 2.6–4.5 mIU/L may have subclinical thyroid disease, there is a lack of evidence of adverse outcome in this group.⁽²⁾

Mild maternal hypothyroidism (subclinical hypothyroidism) has been implicated as the cause of neuro-psychointellectual deficit in offspring^(3,4). Accurate reference intervals in early pregnancy would make it possible to better define this condition. In cases of overt hypothyroidism the fetal consequences can be extreme⁽⁵⁾. However, it appears that the maternal level and delivery of FT4 and not T3 to the fetus is critical for the neuropsychological development of the fetus⁽⁶⁾.

CONCLUSION

The present study was aimed to evaluate thyroid function during pregnancy. The major findings were that 24% pregnant women attending a Medical College hospital in Odisha have hypothyroidism and majority (83.33%) of these women have sub-clinical hypothyroidism. This study concludes that there is a high prevalence of hypothyroidism, majority being subclinical in pregnant women from India. Hence universal screening of hypothyroidism may be desirable in our country.

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CORRESPONDING AUTHOR



Dr. Poonam Mehta, Final Year PG Student,
Department of Physiology, Hi-Tech Medical
College & Hospital, Bhubaneswar, Odisha, India
Email: *poonam7201@yahoo.co.in*
Mob: +91-9431348151