



Biochemical Evaluation of Thyroid Hormone in Tribal Pregnant Women in Udaipur District of Rajasthan

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Abstract

Background: *Thyroid activity was produced during pregnancy, which allows the healthy individual to remain in a net euthyroid state. However, both hyper and hypothyroidism can occur in pregnant patients.¹ The normal changes in thyroid activity and the association of pregnancy with conditions that can cause hyperthyroidism necessitates careful interpretation of thyroid function tests during pregnancy.² Maternal and perinatal morbidities will be well-documented complications of pregnancy in women with thyroid dysfunction, both clinical and subclinical. A thyroid disorders was seen in about 2-5 % of pregnant women, and timely intervention can be done if detected early.*

Aim of study: *Biochemical Evaluation of Thyroid Hormone in Pregnant women in Udaipur District of Rajasthan.*

Study Area: *The present study will be conducted in PMCH, Udaipur.*

Study Design: *The study will design and undertaken in the Central laboratory of PMCH Udaipur. The cases of this study compare the pregnant women or non pregnant women.*

Statistical Analysis: *Data thus collected will be entered in Microsoft excel 2007 Worksheet in the form of master chart. These data will be classified and analyzed as per the aims and objectives.*

Result: *When comparing each hormone between pregnancy and non pregnancy and among gestational stages, TSH concentration in normal women (2.52 ± 0.15) and pregnant women during first trimester (2.15 ± 0.04) second trimester ($2.45 \pm 0.03^{**}$) third trimester ($0.04 \pm 0.01^{**}$) showed statistically significant decline in first trimester ($P < 0.001$), followed by a rise which almost reached the non pregnancy level in the second trimester and third trimester.*

Conclusion: *Prior to the introduction of screening for thyroid dysfunction in early pregnancy, it is necessary to establish trimester specific reference intervals for TSH based on ethnic background, methods of analysis, selection criteria of normal subjects, and calculation method. The reference intervals determined in this study for each trimester of pregnancy are recommended for evaluation of pregnant Indian women. These study findings are a step toward establishing trimester-specific normative data of thyroid function tests in ethnic Indian pregnant population.*

Keywords: *Thyroid Hormone, Pregnant Women, Tribal.*

Introduction

Significant changes was occurs by normal thyroid activity during pregnancy, including a two to three fold increase in thyroxine binding globulin concentrations, a $30 \pm 100\%$ increase in total triiodothyronine and thyroxine concentrations, increased serum thyroglobulin, and increased renal iodide clearance. During pregnancy, insightful changes in thyroid physiology occur, resulting in different thyroid stimulating hormone (TSH) and free thyroxine (FT4) to the non pregnant state. Mild thyroid stimulating activity was also done by HCG hormone. Pregnancy produces an overall increase in thyroid activity, which allows the healthy individual to remain in a net euthyroid state. However, both hyper and hypothyroidism can occur in pregnant patients.¹ A necessitates careful interpretation of thyroid function tests during pregnancy must be done as the normal changes in thyroid activity and the association of pregnancy with conditions can cause hyperthyroidism.²

Maternal thyroid dysfunction is associated with an increased risk of various adverse maternal and child outcomes, including miscarriage, intrauterine growth retardation, hypertensive disorders, preterm delivery, and a decreased child IQ (2–4). About 2–5% of pregnant women suffer from thyroid disorders, and timely intervention can be done if detected early.¹ It has been proven that mother and fetus, was affected during and after the pregnancy by the outcome of maternal thyroid disorders.

Methodology

Study Area: The present study will be conducted in PMCH, Udaipur.

Study Design: The study will design and undertaken in the Central laboratory of PMCH Udaipur. The cases of this study compare the pregnant women or non pregnant women.

Study period: Jan. 2018 to oct.2018

Sample Population: Assessment of thyroid function during pregnancy (or not) have done with a careful clinical evaluation of the patient's

symptoms as well as measurement of TSH and free, not total, thyroid hormone at Udaipur fulfilling inclusion criteria till sample size achieved or end of study period whichever is earlier.

Sample Size: We divide our 30 samples in 15 cases and 15 as control group.

Inclusion Criteria: A total of 30 patients (15)/controls (15) will be select in Tribal area in Udaipur, Rajasthan.

Exclusion Criteria: All male Patients will be excluded from the study:

All diagnosed patients were further evaluated for present study by routine biochemical investigations and specific laboratory investigations. All laboratory investigations were carried out in the clinical Biochemistry laboratory at Udaipur.

Method of Thyroid Tests

The alterations in thyroid function during pregnancy or non pregnancy can poses challenges in interpretation of laboratory thyroid tests. In our current study, routine thyroid function test assays measure TSH are widely available.⁵TSH, The decrease in TSH during the first ,second and third trimester, but the following table gives some guidance on appropriate gestational age reference ranges.

First trimester	0.1 to 2.5 ((μ IU/ml)
Second trimester	0.2 to 3.0
Third trimester	0.3 to 3.0
Non pregnant women	0.27 to 4.20

Statistical analysis

Data thus collected will be entered in Microsoft excel 2007 Worksheet in the form of master chart. These data will be classified and analyzed as per the aims and objectives.

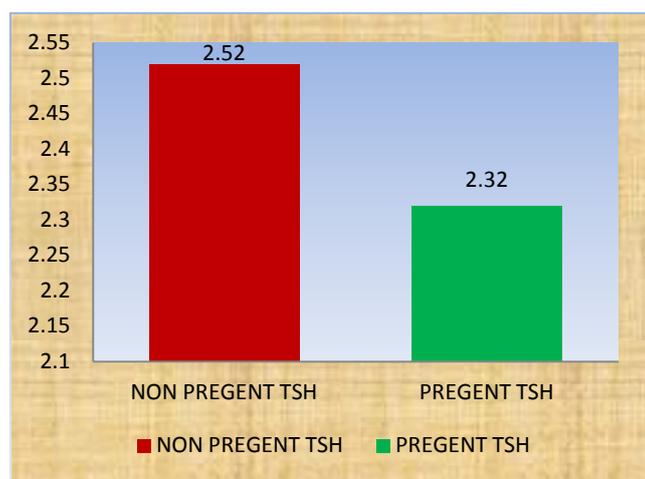
Observation & Result

Table No.1: Table showing TSH level in normal and pregnant women

Groups	n	TSH (μ IU/ml)
Non pregnant	15	2.52 ± 0.15
Pregnant		
First trimester	15	2.15 ± 0.04
Second trimester	15	$2.45 \pm 0.03^{**}$
Third trimester	15	$0.04 \pm 0.01^{**}$

(**at the $P < 0.001$ sta. significance)

The average concentration of each hormone during each trimester is shown in table -1. When comparing each hormone between pregnancy and non pregnancy and among gestational stages, TSH concentration in normal women (2.52 ± 0.15) and pregnant women during first trimester (2.15 ± 0.04) second trimester ($2.45 \pm 0.03^{**}$) third trimester ($0.04 \pm 0.01^{**}$) showed statistically significant decline in first trimester ($P < 0.001$), followed by a rise which almost reached the non pregnancy level in the second trimester and third trimester.



Graph 1 Showing TSH level in Normal Women and Pregnant Women

Discussion

The need to assess thyroid function during pregnancy is not uncommon. Furthermore, proper diagnosis and treatment of thyroid dysfunction during pregnancy is important to avoid both fetal and maternal complications. However, thyroid activity undergoes many changes during normal pregnancy including a significant increase in serum TBG, thyroglobulin, total T4, and total T3; an increase in renal iodide clearance; and stimulation of the thyroid by hCG. Taken together, this thyroid dysfunction during pregnancy can be diagnosis by these changes. Assessment of both hyper and hypothyroidism during pregnancy should be done with a careful clinical evaluation of the patient's symptoms as well as measurement of TSH and free thyroid hormones either directly or via a calculated index. Measurement of thyroid auto antibodies may also

be useful in selected cases to diagnose maternal Graves disease or Hashimoto thyroiditis and to assess risk of fetal or neonatal disease.

In 2010 Qiu wei Wang, Bin Yu a scientist who collected the serum respectively at various trimesters. Both SLRI and GSRI differed substantially from that for non-pregnant women ($p < 0.05$). There are similar fluctuations of serum TSH, FT4 and TPO-Ab during normal pregnancy. Although there were no significant differences in most reference intervals between SLRI and GSRI. But the IQR of SLRI were usually smaller than GSRI, especially in 1st trimester. The women (14.4%) at various trimesters whose serum TSH concentration was within SLRI would be misclassified, while women (1.3%) with a TSH concentration outside limit would not be identified. Only 0.11-3.84% women would get thyroid diseases during pregnancy. Subclinical hypothyroidism is most common maternal thyroid disorders.⁴

In 2015 a study done by Ian R McNeil, this study showed that the diagnosis of subclinical hypothyroidism rests on the recognition of an increased serum concentration of TSH which may be affected by many factors including gestational age, analytical method, the antibody status of the mother, ethnicity, iodine nutrition and even the time of day when the blood is collected. The 97.5 percentile of TSH at the end of the first trimester is commonly used as the upper boundary of normal in early pregnancy with a default value of 2.5 mIU/L specified in a number of recent clinical guidelines.³

In my present study TSH concentration in normal women (2.52 ± 0.15) and pregnant women during first trimester (2.15 ± 0.04) second trimester ($2.45 \pm 0.03^{**}$) third trimester ($0.04 \pm 0.01^{**}$) showed statistically significant decline in first trimester ($P < 0.001$), followed by a rise which almost reached the non pregnancy level in the second trimester and third trimester.

Conclusion

Prior to the introduction of screening for thyroid dysfunction in early pregnancy, it is necessary to establish trimester-specific reference intervals for TSH based on ethnic background, methods of analysis, selection criteria of normal subjects, and calculation method. The reference intervals determined in this study for each trimester of pregnancy are recommended for evaluation of pregnant Indian women. These study findings are a step toward establishing trimester-specific normative data of thyroid function tests in ethnic Indian pregnant population.

Conflicts of Interests: None

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