

A Study of Thyroid Disorders in Third Trimester of Pregnancy

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ABSTRACT

Background: Thyroid disease is the second most common endocrine disease to affect women of reproductive age. Thyroid disorders can result into adverse reproductive and pregnancy implications. Although gestational hyperthyroidism is uncommon (0.2%), gestational hypothyroidism occurs in higher prevalence (2.5%) and can lead to neonatal and child neurodevelopmental deficits and maternal obstetric complications. Thyroid-related pathophysiologic changes aggravated by pregnancy. Trimester-specific reference intervals for thyroid function tests are critical for maintaining the delicate balance of thyroid hormones during pregnancy. Thyroid-stimulating hormone (TSH) levels are low-normal in the first trimester, with normalization by the second trimester and remains normal in third trimester also. Hypothyroidism during pregnancy is associated with gestational hypertension and low birth weight. Women with hyperthyroidism (high TSH levels) had a >3-fold increase in risk of very preterm delivery.

Objective: To evaluate the prevalence of thyroid disorders in pregnancy.

Methods: This was a observational study among the pregnant women attended the labour room for full term normal delivery. All the pregnant women who were registered at Community Health Centre for delivery along with results of TSH levels were considered as study subjects.

Results: The present study revealed a prevalence of 2.32% of hyperthyroidism and a prevalence of 7.94% of hypothyroidism.

The mean age of study subjects was 23.38 years \pm 3.60. The TSH levels were observed on different parameter like age, caste, parity etc. Most of the pregnant women were primiparous and 2nd gravida.

Conclusions: Thyroid disorders are common in pregnancy, and the most common disorder is subclinical hypothyroidism. Early detection of Thyroid dysfunction can help in starting treatment in affected pregnancies, for better outcome. Hence, Thyroid function test must be advised to all pregnant women.

Key words: Pregnancy, Thyroid Disorders, TSH Levels, Third Trimester.

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INTRODUCTION

Diseases of the thyroid gland are common; affecting about 5% of the general population, and predominantly affect females. It is a proved fact that maternal thyroid disorder influences the outcome of both mother and fetus, during and also after pregnancy. A normal pregnancy results in a number of important physiological and hormonal changes that alter thyroid function. About 2 to 5% of pregnant woman suffer from any variety of thyroid disorders and timely intervention can be done if detected early.¹ Values of thyroid hormones during pregnancy differ from non-pregnant values because of physiological changes. Values in pregnancy also vary from trimester to trimester, and although no consensus about this value has been made yet. Several community-based cohort studies were conducted to establish trimester-specific reference ranges (TSRRs) for T3, T4, and TSH in different

communities.²⁻⁹ Studies have shown considerable variations in the thyroid hormone profile among populations of different origin, probably owing to modulatory effects of ethnicity¹⁰, parity¹², body mass index (BMI)¹³, iodine insufficiency^{14,15}, and certain pregnancy-induced disorders^{16,17} of thyroid function.

According to recent American Thyroid Association (ATA) guidelines-2017, the recommended reference ranges for TSH are 0.1 to 2.5 mIU/L in the first trimester, 0.2 to 3.0 mIU/L in the second trimester, and 0.3 to 3.0 mIU/L in the third trimester.¹⁸

The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. It is associated with fetal loss, placental abruptions, pre-eclampsia, preterm delivery and reduced intellectual function in the offspring.¹⁹ In pregnancy, overt hypothyroidism is seen in 0.2%²⁰ and sub clinical hypothyroidism

in 2.3% cases.²¹ There has been a wide geographic variation in prevalence of hypothyroidism during pregnancy. It varies from 2.5% from the West to 11% from India.^{22,23} It seems that prevalence of hypothyroidism is more in Asian countries compared to the West.²⁴

Hyperthyroidism occurs in 0.1–0.4% of pregnant women, whereas about 2–3% of pregnant women are hypothyroid, of whom 0.3–0.5% have overt hypothyroidism and 2–2.5% present subclinical hypothyroidism.²⁵ Uncontrolled maternal hyperthyroidism has been associated with fetal tachycardia, small for gestational age babies, prematurity, stillbirths and possibly congenital malformations.

MATERIALS & METHODS

The present observational study was conducted among the pregnant women who came to the Community Health Centre (in municipal area) in third trimester at term for delivery from January 2018 to April 2018. A total number of 763 women were registered for the delivery out of which only 302 were having TSH reports. The data were obtained with regard to age, caste, religion, and parity.

RESULTS

The data was analyzed on SPSS 16.0.

- i) **TSH level:** The American Thyroid Association guidelines 2017 recommends the normal range of TSH in third trimester from 0.3 mIU/L to 3.0 mIU/L. 71.86% of the pregnant women were in the normal range of TSH whereas 2.32% were having a low TSH level (<0.3 mIU/L) i.e. Hyperthyroidism and 25.82% with a high TSH level (>3 mIU/L) i.e. Hypothyroidism (both subclinical and overt). The range of TSH levels varied from a minimum of 0.01 mIU/L to a maximum of 18 mIU/L. However, many of the studies across the globe states that the value of Thyroid varies according to ethnicity. American Thyroid Studies also recommends the use of local data as a reference values. Various Indian studies recommend an upper range of TSH in third trimester of pregnancy at 4.5 mIU/L. However, the American Association of Clinical Endocrinology and the Endocrine Society Consensus panel recommended that 4.5 mIU/L should be maintained as the upper limit of normal. They reasoned that although some individuals within the range of 2.6–4.5 mIU/L may have subclinical thyroid disease, there was a lack of evidence of adverse outcome in this group. Considering this upper value (4.5 mIU/L) the number of pregnant women came to 24 out of 302 pregnant women as Hypothyroidism (7.94%).
- ii) **Age:** The mean age group of the females was 23.38 years \pm 3.60 with a minimum of 18 years and a maximum of 36 years. 58.28% women were in the age group of 19–24 years followed by 31.79% in the age group of 24–29 years. The mean age group of Hyperthyroid pregnant women (n=7) was 23.29 years \pm 5.529 whereas the same among the Hypothyroid pregnant women (n=24) was 22.79 years \pm 3.741.
- iii) **Caste and Religion:** Most of the pregnant women were belonging to the other backward castes (40.7%) and Schedule tribes (37.4%). Muslims were 5.6% among the study subjects. 57.14% were belonging to OBC whereas others were equal 14.28% in Hyperthyroidism category. In

hypothyroid pregnant women, most affected women were 45.33% among OBC and 33.33% among Schedule Tribes.

- iv) **Parity:** Almost 1/3rd (33.1%) of the study subjects were primiparous where as 66.9% were multigravida. Among multigravida most of the pregnant women were either in 2nd gravida (37.4%) followed by 3rd gravida (21.5%). Others were 4th gravida (5.6%) and 5th gravida (2.3%). Most of the hyperthyroid pregnant women (85.17%) were 2nd gravida except one (14.83%) was primiparous whereas in hypothyroid group the group involved was primiparous (29.16%), 2nd gravida (33.34%) and 3rd gravida (29.16%).

DISCUSSION

This present study was aimed to assess the prevalence of thyroid disorders among pregnant women at third trimester. There has been a wide geographic variation in prevalence of hypothyroidism during pregnancy. It varies from 2.5% from the West to 11% from India.

Sahu et al, have done thyroid function during second trimester in high-risk pregnant women and reported that prevalence of thyroid disorders, especially overt and subclinical hypothyroidism was 6.47%.²⁵ In another study from India, Nambiar V et al have reported prevalence of hypothyroidism and thyroid autoimmunity as 4.8% and 12.4%, respectively and were significantly associated with miscarriage²⁷ whereas the present study showed a 2.32% of hyperthyroidism and 7.94% prevalence of hypothyroidism.

CONCLUSION

This study concludes that thyroid disorders are common in pregnancy, and the most common disorder is hypothyroidism. Screening for thyroid function and autoimmunity, and timely and appropriate treatment, will improve pregnancy outcome.

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