

# Thyroid Dysfunction in High Risk Pregnancies

Syeda Hina Ali, Kamran Liaqat, Sahar Rasool

## ABSTRACT

**Objective:** Frequency of thyroid dysfunction in high risk pregnancies. **Settings:** Department of Obstetrics and Gynecology, Allied Hospital Faisalabad. **Study design:** Cross-sectional study. **Duration of study:** 16-06-2014 to 15-12-2014. **Methodology:** A total of 245 patients were included in this study. On the basis of TSH, T3, T4 reports thyroid dysfunction (hypothyroidism/hyperthyroidism) was observed. **Results:** Mean age of the patients was 29.43±5.21 years. Mean gestational age was 36.45±2.72 weeks. Thyroid dysfunction was observed in 63 patients (25.7%). Out of these 63 cases, Hypothyroidism found in 44 (69.9%) and Hyperthyroidism in 19 patients (30.1%). High risk pregnancy factors were IUGR in 85 patients (34.7%), GDM in 100 patients (40.8%), preeclampsia in 52 patients (21.2%) and IUFD in 8 cases (3.3%). Distribution of high risk pregnancy factors in cases of thyroid dysfunction (n=63) were as follows: IUGR in 17 cases (27.0%), GDM, 20 cases (31.7%), preeclampsia in 18 cases (28.6%). IUFD in 8 cases (12.7%). Stratification of effect modifiers was carried out. **Conclusion:** The rate of thyroid dysfunction is increased in pregnant women with high-risk pregnancy. Under the currently recommended screening method, the majority of thyroid dysfunctions may be missing. With a full awareness of high incidence of thyroid dysfunction in pregnant women with obstetrical or medical complications, consideration should be given regarding the screening efficiency during pregnancy.

**Keywords:** Thyroid dysfunction, High risk pregnancy, TSH, T3, T4.

### Corresponding Author

**Dr. Syeda Hina Ali**

Senior Registrar, Gynecology  
Allied Hospital, Faisalabad  
Contact: +92 300-6652174  
Email: syeda.hina.ali@gmail.com

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## INTRODUCTION

A pregnancy is considered high-risk when there are potential complications that could affect the mother, the baby, or both. High-risk pregnancies require management by a specialist to help ensure the best outcome for the mother and baby. During pregnancy, several important physiological changes take place, with substantial repercussions for women's thyroid gland. At the same time, maternal thyroid hormones (TH) play a crucial role in the development and function of both the fetus and the placenta.<sup>1</sup> The maternal physiological changes that occur in normal pregnancy induce complex endocrine and immune responses. During a normal pregnancy, thyroid gland volume may enlarge, and thyroid hormone production increases. Hence, the interpretation of thyroid function during gestation needs to be adjusted according to pregnancy-specific ranges. The elevated prevalence of gestation-related thyroid disorders (10%-15%) and the important repercussions for both mother and fetus reported in multiple studies throughout the world denote the necessity for routine thyroid function screening during pregnancy. Once thyroid dysfunction is suspected or confirmed, management of the thyroid disorder necessitates regular monitoring in order to ensure a successful outcome.<sup>2</sup> Serum TSH as the most accurate indicator of thyroid dysfunction in pregnancy.<sup>3</sup> Thyroid dysfunction and auto antibodies in pregnancy are associated with increased risk of gestational diabetes and adverse birth outcomes and concluded that high TSH levels and thyroid autoimmunity in pregnancy may detrimentally effect pregnancy and birth outcomes.<sup>4</sup> Apart

from preterm delivery or miscarriage, it was also reported that major obstetrical complications such as pre-eclampsia, IUGR or IUFD were closely associated with hypothyroidism.<sup>5,6</sup>

The overall prevalence of thyroid dysfunction in high risk pregnancy was 24.7% (hypothyroidism= 68.04% and hyperthyroidism = 31.96%). In each group, thyroid dysfunction was as follows: 25% in IUGR (hypothyroidism= 31.8% and hyperthyroidism = 25.81%), 30% in GDM (hypothyroidism= 31.8% and hyperthyroidism = 41.93%), 27% in preeclampsia (hypothyroidism= 21.2% and hyperthyroidism = 9.68%), 12% in IUFD (hypothyroidism= 6.1% and hyperthyroidism = 6.45%).<sup>7</sup>

ACOG and The Endocrine Society recommended that thyroid testing should be limited to women with symptoms of thyroid disease and those with a history of thyroid disease or other medical conditions associated with it, such as type 1 diabetes or autoimmune disorders.<sup>7</sup> Hence the rationale of the study is that special attention should be given to extend the screening factors including women with GDM, IUGR, IUFD and pre-eclampsia. However, this trial was conducted to estimate the rate of thyroid dysfunction in pregnant females with medical or obstetrical complications. If we found a higher rate of thyroid dysfunction in few high-risk groups, further reliable and authentic steps would be recommended.

## METHODOLOGY

**Study Design:** Cross-sectional study.

**Settings:** Gynecology Department, Allied Hospital Faisalabad.

**Duration of Study:** June 16, 2014 to December 15, 2014.

## Methods:

A total of 245 cases with singleton high risk pregnancies (GDM, IUFD, IUGR, preeclampsia) from 24-40 weeks of gestation were included while those with multiple pregnancies and congenital malformations were excluded from the study. The identity of the patients was recorded and an informed consent was obtained from all the patients or their guardians to include their data in research work. After taking detailed history and performing general and local examination (obstetrical), each patient was advised based line investigation and thyroid profile (TSH, T3, T4) from the pathology department Allied Hospital Faisalabad and it was reported by pathologist. On the basis of TSH, T3, T4 reports thyroid dysfunction (hypothyroidism/ hyperthyroidism) was noticed.

## RESULTS

Regarding age distribution, 143 patients (58.4%) were between 20-30 years old and 102 patients (41.6%) were between 31-40 years of age. Mean age of the patients was  $29.43 \pm 5.21$  years (Table-1).

**Table 1: Distribution of patients by age**

Age (Year)	Number	Percentage
20-30	143	58.4
31-40	102	41.6
<b>Total</b>	<b>245</b>	<b>100.0</b>

Thyroid dysfunction was observed in 63 patients (25.7%). Out of these 63 cases, Hypothyroidism found in 44 (69.9%) and Hyperthyroidism in 19 patients (30.1%) (Table-2 & 3).

**Table 2: Overall thyroid dysfunction**

Thyroid dysfunction	Number	Percentage
Yes	63	25.7
No	182	74.3
<b>Total</b>	<b>245</b>	<b>100.0</b>

**Table 3: Type of thyroid dysfunction**

Thyroid dysfunction	Number	Percentage
Hypothyroidism	44	69.9
Hyperthyroidism	19	30.1
<b>Total</b>	<b>63</b>	<b>100.0</b>

High risk pregnancy factors were IUGR in 85 patients (34.7%), GDM in 100 patients (40.8%), preeclampsia in 52 patients (21.2%) and IUFD in 8 cases (3.3%) (Table-4).

**Table 4: Distribution of high risk pregnancy factors**

Factors	Number	Percentage
IUGR	85	34.7
GDM	100	40.8
Preeclampsia	52	21.2
IUFD	8	03.3
<b>Total</b>	<b>245</b>	<b>100.0</b>

Distribution of high risk pregnancy factors in cases of thyroid dysfunction (n=63) were as follows: IUGR in 17 cases (27.0%), GDM, 20 cases (31.7%), preeclampsia in 18 cases (28.6%). IUFD in 8 cases (12.7%) (Table-5).

**Table 5: High risk pregnancy factors in cases of thyroid dysfunction (n=63)**

Factors	Hypo-thyroidism	Hyperthy-roidism	Total
IUGR	13 (76.5%)	04 (23.5%)	17 (27.0%)
GDM	12 (60%)	08 (40%)	20 (31.7%)
Preeclampsia	13 (72.3%)	05 (27.7%)	18 (28.6%)
IUFD	06 (75%)	02 (25%)	8 (12.7%)
<b>Total</b>	<b>44 (69.9%)</b>	<b>19 (30.1%)</b>	<b>63 (100%)</b>

## DISCUSSION

During the first few months of pregnancy, the fetus relies on the mother for thyroid hormones. Thyroid hormones play an essential part in normal brain development. Deprivation of the maternal thyroid hormone due to hypothyroidism can have irreversible effects on the fetus. Early studies found that children born to mothers with hypothyroidism during pregnancy had lower IQ and impaired psychomotor (mental and motor) development. If properly controlled, often by increasing the amount of thyroid hormone, women with hypothyroidism can have healthy, unaffected babies.<sup>8</sup>

Uncontrolled hyperthyroidism has many effects. It may lead to preterm birth (before 37 weeks of pregnancy) and low birth weight for the baby. Some studies have shown an increase in pregnancy-induced hypertension (high blood pressure of pregnancy) in women with hyperthyroidism.<sup>8</sup>

A severe, life-threatening form of hyperthyroidism, called thyroid storm, may complicate pregnancy. This is a condition in which there are extremely high levels of thyroid hormone that can cause high fever, dehydration, diarrhea, rapid and irregular heart rate, shock and death, if not treated.<sup>8</sup>

Thyroid dysfunction can lead to premature birth, pregnancy-induced hypertension, increased fetal mortality, and low infant birth weight.<sup>9</sup> Maternal hypothyroidism and hypothyroxinemia in the first trimester of pregnancy may be harmful to fetal brain development and lead to mental retardation.<sup>10</sup> In view of the potential adverse outcomes associated with maternal thyroid disorders and the obvious benefits of treatment, some expert panels have suggested routine thyroid function screening in all pregnant women.<sup>11</sup>

However, the Endocrine Society Clinical Practice Guideline<sup>12</sup> recommends a case finding approach where only women at high-risk for thyroid disorders are tested; these women include those who have a personal or family history of thyroid disease, a personal history of type I diabetes, or other autoimmune disorders, clinical signs suggestive of thyroid disorders, goiter, thyroid antibodies, history of previous therapeutic head or neck irradiation or a history of miscarriage, preterm delivery, or infertility.

In present study, the frequency of thyroid dysfunction in the diabetes (31.7%) which is comparable with two studies carried out by Vaidya et al and Nakova et al.<sup>13</sup>

On the other hand, the incidences of thyroid dysfunction in IUGR (27%) and preeclampsia (28.6%) were high. In this study screening of thyroid disease in pregnant women could pick up in 15% of affected women only. In other words, 85% of the cases may be missed in females with thyroid dysfunction. However, the strategy for diagnosis of thyroid dysfunction during gestational period is not adequate.

We recorded significantly higher cases of hypothyroidism than hyperthyroidism, a close association of hypothyroidism with gestational diabetes mellitus was recorded.<sup>14</sup> In present study, also found that the incidence of thyroid dysfunction in the DM group was similar to the groups of IUGR, and hypertension. The DM group in our study mainly consisted of gestational diabetes mellitus. High frequency of anti-thyroid antibodies in pregnant women with gestational diabetes mellitus was also reported.<sup>14</sup> The literature recommends that thyroid surveillance should be limited to females presenting with thyroid disease/symptoms and having any background of other medical disorders like autoimmune disorders or type 1 DM.<sup>15</sup>

High rate of thyroid dysfunction in current study was found. One of the reasons was the trimester-specific range for TSH in this study. The normal range of TSH in general population is 0.45 to 4.5mU/L. Adequate timing of thyroid detection must also be considered. Higher hCG levels during first trimester may result in hCG-induced hyperthyroidism.

## CONCLUSION

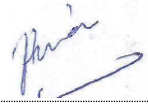

High risk pregnancies have greater risk of thyroid dysfunction.

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## AUTHORSHIP AND CONTRIBUTION DECLARATION

AUTHORS	Contribution to The Paper	Signatures
<b>Dr. Syeda Hina Ali</b> Senior Registrar, Gynecology Allied Hospital, Faisalabad	Data Collection, Study Designing	
<b>Dr. Kamran Liaqat</b> Medical Officer, Anesthesia & ICU Allied Hospital, Faisalabad	Discussion & References Writing	
<b>Dr. Sahar Rasool</b> Assistant Professor, Medicine FMU/DHQ Hospital, Faisalabad	Final Layout, Proof Reading	