



## OBSERVATIONAL STUDY OF THYROID DISORDER IN PREGNANT WOMEN AND ITS CORRELATION WITH FOETOMATERNAL OUTCOME

### KEY WORDS

prevalence, foetomaternal outcome

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### ABSTRACT

**Objective-** To study the prevalence of thyroid disorder in pregnant women and its correlation with foetomaternal outcome. **Methodology-** 1100 pregnant women attending the outer patient department of government medical college and hospital were followed and the prevalence of thyroid disorder was calculated and foetomaternal outcome was observed. **Result-** In this study, prevalence of thyroid disorder was 10.45% which was high when compared to other regions in India and in other parts of Asia. Subclinical hypothyroidism and Overt hypothyroidism was 5.6% and 2.6% respectively. Subclinical and Overt hyperthyroidism was 1.6% and 0.54% respectively. Subclinical hypothyroidism was more prevalent and hidden, leading to the poor obstetrical outcome and fetal complications. Rate of miscarriage was high in overt hyperthyroid patients. **Conclusion-** The overall prevalence of thyroid disorder in pregnant females attending the tertiary hospital in Uttarakhand was found to be 10.45% and associated with adverse foetomaternal outcome.

### INTRODUCTION

Pregnancy has a profound impact on the thyroid gland and thyroid function. The gland increases 10% in size during pregnancy in iodine-replete countries and by 20%–40% in areas of iodine deficiency. The thyroid undergoes physiological changes during pregnancy, such as moderate enlargement of the gland and increasing of vascularization. Beta-Human chorionic gonadotropin (B-HCG) causes thyroid stimulation since the first trimester, due to structural analogy with thyroid-stimulating hormone (TSH)<sup>(1)</sup>. The thyrotropic activity of B-HCG causes also a decrease in serum TSH in the first trimester so that pregnant women have lower serum TSH concentrations than non-pregnant women<sup>(2)</sup>. Production of thyroxine (T4) and triiodothyronine (T3) increases by 50%, along with a 50% increase in the daily iodine requirement. Knowledge regarding the interaction between the thyroid and pregnancy/the postpartum period is advancing at a rapid pace. Only recently has a TSH of 2.5 mIU/L been accepted as the upper limit of normal for TSH in the first trimester. In pregnancy oestrogen induces TBG which alters the thyroid function and there is also increased amount of HCG which act on thyroid gland as TSH. Different factors alter thyroid function in pregnancy. Thyroid disorder is associated with many complications:

### MATERNAL COMPLICATION

- Risk of miscarriage<sup>(3)</sup>.
- Preeclampsia
- Placental abruption
- Preterm delivery
- Stillbirth<sup>(4)</sup>

### FOETAL COMPLICATION

1. Growth retardation
2. Mental retardation
3. Cretinism
4. Congenital anomalies<sup>(5,6,7)</sup>

Thyroid disorder is very common in subhimalayan belt and our government medical college is in foothill areas and is draining patients from hilly areas of kumaun region. Therefore this study was conducted in this region as early diagnosis and treatment of thyroid disorder in pregnancy can decrease the foetomaternal complications.

### METHODOLOGY:

This study was conducted in Department of Obstetrics and Gynaecology, Dr. Susheela Tiwari Government hospital and Medical College, Haldwani, Uttarakhand. This is an observational, prospective study to observe the prevalence of thyroid disorder during pregnancy and its foetomaternal outcome, which was undertaken for a study period of 1 year. The study population involved consenting pregnant patients of Department of Obstetrics and Gynaecology of Dr. Susheela Tiwari Government Hospital, Haldwani. Due written informed consent was also obtained from the patients before the recruitment. This is a Prospective observational study conducted in the department of Obstetrics and Gynaecology of Dr. Susheela Tiwari Government Hospital, Haldwani.

### Inclusion Criteria–

- Those who have given the consent.
- All pregnant female
- Singelton Pregnancy
- Primigravida/Multigravida.

### Exclusion Criteria

- Those not willing to participate in the study.
- Multifetal Gestation
- Known case of Diabetes mellitus
- Known case of hypertension

### The following outcome variables in relation to thyroid disorders studied:

#### In the mother following parameters were evaluated

- Abortion, Hyperemesis, Preeclampsia, Abruptionplacenta, Preterm delivery, IUGR, Stillbirth

#### In the foetus following parameters were evaluated

- Apgar score, Birth weight, Cry, Congenital malformation, Jaundice, feeding problems

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean ± SD and median. Normality of data was tested by Kolmogorov-Smirnov test. A p value

of <0.05 was considered statistically significant. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0

### OBSERVATION AND RESULTS:

A total of 1100 randomly selected patients were followed in this study. In the present study, 115 out of 1100 pregnant women screened had thyroid disorders. The prevalence of thyroid disorders in this study was 10.45%

#### Observation in present study were-

- Prevalence of thyroid disorder was 10.45%
- Prevalence of subclinical hypothyroidism was 5.6% (62 patients out of 1100)
- Prevalence of overt hypothyroidism was 2.6% (29 patients)
- Prevalence of subclinical hyperthyroidism was 1.6% (18 patients)
- Prevalence of overt hyperthyroidism was 0.54% (6 patients)

**Table 1: Distribution of patients in different groups**

GROUPS	NUMBER OF PATIENTS
SUBCLINICAL HYPOTHYROID	62
OVERT HYPOTHYROID	29
SUBCLINICAL HYPERTHYROID	18
OVERT HYPERTHYROID	6
TOTAL	115

Prevalence of types of thyroid disorders among 1100 pregnant woman screened is 10.45%.

**Table 2: Distribution of different thyroid disorder according to TSH level**

TYPE OF DISORDR	NO. OF CASES	MEAN OF TSH	SD
SUBCLINICAL HYPOTHYROID	62	5.57	1.24
OVERT HYPOTHYROID	29	5.87	1.27
SUBCLINICAL HYPERTHYROID	18	0.03	0.02
OVERT HYPERTHYROID	6	0.014	0.003

The mean of TSH level in the cases of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism, overt hyperthyroidism was 5.57, 5.87, 0.04, and 0.06 respectively.

In this study, subclinical hypothyroidism in pregnancy is associated with the complications like PE (9.68%), AP (1.61%), PTD (8.06%), IUGR (9.68%), LBW (33.87%) and SB (1.61%).

In overt hypothyroidism complications were PE (13.79%), AP (3.45%), PTD (17.24%), IUGR (6.9%), LBW (41.38%) and SB (3.45%).

In subclinical hyperthyroidism complications were PE (11.11%), AP (0%), PTD (5.56%), IUGR (5.56%) and LBW (27.78%).

In overt hyperthyroidism complications were PE (16.67%), PTD 0%, IUGR (33.34%), AB (33.33%) LBW (50%) and SB (25%).

The incidences of the complications varied in different studies but some studies are comparable. In our study the incidence of abortion was 1.7%, which is not significant and also not mentioned in any other studies except the study conducted by Ajmani, et al. which showed the incidence of abortion as 16.6%. Three newborns were diagnosed to have abnormal thyroid function test on the basis of 3<sup>rd</sup> day blood sample but a confirm diagnosis could not be made as it may be due to a transient cause due to transplacental transfer of antibodies.

Incidences of the complications varied with the studies. Some studies have not classified the hyperthyroid cases in to subclinical and overt type. So incidence of PE and PTD was significantly high in the study of Kriplani<sup>(8)</sup>, et al. than the present study. In the present

study, overt hyperthyroid patients were prone to have miscarriage 33.33%, which was significantly high.

### Discussion:

The overall prevalence of thyroid disorder in pregnant females attending the tertiary hospital in Uttarakhand was found to be 10.45%. The mean TSH values in overt hypothyroid, subclinical hypothyroid subclinical hyperthyroid and overt hyperthyroid is 5.57, 5.87, 0.03 and 0.014 mIU respectively.

Maternal Complications like preeclampsia, preterm delivery and postpartum hemorrhage are more in patients of overt hypothyroidism.

Hyperemesis and risk of abortion was more in patients of overt hyperthyroidism.

Foetal complications like jaundice, low birth weight and feeding problems were more common in patients of overt hypothyroidism while IUGR and low birth weight were more in patients of overt hyperthyroidism.

There is a wide variation in the prevalence of hypothyroidism in pregnancy between western countries and India. So various reasons have been proposed for the increased prevalence of hypothyroidism in India like decreased iodine content in diet and presence of goitrogens in diet which are previously reported from several studies.

Also increased prevalence of hypothyroidism in our studies was due to iodine deficiency in the mountains and plains of northern India which have long been infamous as the "Himalayan goiter belt. Presence of goitrogens in diet<sup>(9)</sup>, micronutrient deficiency such as selenium and iron deficiency may cause hypothyroidism and goiter<sup>(10)</sup>. Due to the immense impact that the maternal thyroid disorder has on maternal and fetal outcome, prompt identification of thyroid disorders and timely initiation of treatment is essential.

### Conclusion

Thus, universal screening of pregnant women for thyroid disorder should be considered especially in a country like India where there is a high prevalence of undiagnosed thyroid disorder.

Ensuring adequate iodine intake of all pregnant women and all other women of reproductive age group. The goal of treatment is to normalize maternal serum TSH values within the trimester specific pregnancy reference range (first trimester, 0.1–2.5 mIU/L; second trimester, 0.2–3.0 mIU/L; third trimester, 0.3–3.0 mIU/L (American thyroid association 2007) so that fetomaternal complications can be minimized.<sup>20</sup>

Treated hypothyroid patients receiving thyroxine who are planning pregnancy should have their dose adjusted by their physician in order to optimize serum TSH values to <2.5 mIU/L preconception. Lower preconception TSH values (within the nonpregnant reference range) reduce the risk of TSH elevation during the first trimester. As there is increased chances of miscarriage in thyrotoxicosis, these women should be rendered euthyroid before planning pregnancy.

In future more studies are needed to study the impact of thyroid disorder on pregnancy so that fetomaternal complications can be minimized.

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