

## Prevalence of Thyroid Disorder in Pregnancy and Pregnancy Outcome

DrPuja Deep

Department of obstetrics and gynaecology, Vardhman Institute of Medical Science Pawapuri Bihar

**Abstract:** Thyroid disorders are among the common endocrine problems in pregnant women. Often overlooked in pregnancy due to nonspecific symptoms and hyper-metabolic state of pregnancy. Western literature shows prevalence of hypothyroidism in pregnancy as 2.5% and hyperthyroidism as 0.1-0.4%. There is paucity of data on prevalence of thyroid disorders in Indian pregnant population. This study was carried out to know prevalence of thyroid disorders in pregnant women in Indian population

**Methods:** One hundred pregnant women attending antenatal clinic in first trimester were registered. Detailed history and examination was done. Apart from routine basic and obstetrical investigations, TSH, FT3 and FT4 level estimation was done.

**Results:** Prevalence of thyroid dysfunction was high in this study in first trimester pregnant women, with subclinical hypothyroidism in 6%, overt hypothyroidism in 2%, subclinical hyperthyroidism 2% and overt hyperthyroidism 0%. **Conclusions:** Prevalence of thyroid disorders, especially subclinical hypothyroidism (6%), overt hypothyroidism (2%) and subclinical hyperthyroidism (2%) was high. To prevent adverse effects on maternal and fetal outcome, we are emphasizing the importance of routine antenatal thyroid screening.

**Key Words:** Anemia, Pediatrics, Iron deficiency anemia

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### I. Introduction

Thyroid disorders are frequently observed during pregnancy and are more frequent in case of mild iodine deficiency (MID). Pregnancy induces fundamental changes in thyroid function and iodine metabolism leading to thyroid stimulation. The main metabolic modifications include 1) a marked rise in estrogen concentration leading to a more than doubling of serum thyroxine, a very serious health problem in India and most common nutritional problems in many parts of the world [1] binding globulin levels; 2) an increase in iodide renal clearance; 3) a transfer of iodide to the fetal compartment; and finally, 4) a direct, albeit transient, stimulation of the thyroid by human chorionic gonadotropin near the end of the first trimester of gestation. In iodine-sufficient areas, pregnant women adjust to meet their thyroid hormone production requirements by increasing their thyroidal iodide uptake to maintain adequate intrathyroidal stores. In iodine-deficient regions, however, such adaptive mechanisms may fail to maintain adequate iodine stores and this may ultimately lead to thyroid dysfunction.

Thyroid disorders during early pregnancy has been associated with adverse obstetric and fetal outcome. The main obstetric complications are abortion, pre-eclampsia, abruptio placenta, preterm labour and the fetal complications are prematurity, low birth weight, still birth and perinatal death. Children born to untreated mothers have profound effect on future intellectual development. Prenatal and postnatal adverse effects including attention deficit and hyperactivity syndrome have been reported in children born to hypothyroid mothers. There is an increase in the incidence of NICU admissions and respiratory distress syndrome. Maternal hypothyroidism in the 1st trimester may be harmful for fetal brain development and leads to mental retardation and cretinism which includes impairment of mental and physical growth and development and has a negative impact on most organ systems. Data from recently published studies have underscored the association between miscarriage and preterm delivery in women with normal thyroid function who test positive for thyroid peroxidase (TPO) antibodies. During the first trimester, approximately 1 in 10 pregnant women develop antibodies to TPO or thyroglobulin and hypothyroidism develops in roughly 16% of these women. Thyroid disorders may be overlooked in pregnancy because of nonspecific symptoms and hyper-metabolic state of pregnancy. Physiological changes of pregnancy can stimulate thyroid disease. Prevalence of thyroid disorders during pregnancy has a wide geographic variation. Western literature shows a prevalence of hypothyroidism in pregnancy of 2.5% and hyperthyroidism in pregnancy has prevalence of 0.1 to 0.4%. There is paucity of data on prevalence of thyroid disorders in Indian pregnant women. Few reports show a prevalence of 4.8% to 11% amongst Indian pregnant population. In view of adverse maternal and fetal outcome in pregnant women with thyroid disorders and obvious benefits of early diagnosis and treatment, some expert panels all

around the world have suggested routine thyroid function screening of all pregnant women. Therefore, this study was carried out in pregnant women during 1st trimester who attended antenatal clinic of Department of Obstetrics and Gynecology, V.I.M.S Pawapuri to know the prevalence of thyroid disorders in pregnant .

## II. Materials And Methods

**Source of the data:** This study was done at VIMS Pawapuri in Department of Obstetrics and Gynecology, 15<sup>th</sup> November, 2015 to 15<sup>th</sup> November, 2017.

**Type of study:** Prospective study done in 1000 pregnant women in 1<sup>st</sup> trimester till delivery.

**Inclusion criteria:** <12 weeks of gestation, Singleton Pregnancy and Primigravida/ Multigravida.

**Exclusion criteria:** Multi fetal gestation, Known chronic disorders like Diabetes and hypertension, Previous bad obstetric history with known cause, patient planned follow up and delivery in other hospital

**Procedure:** 1000 pregnant women attending antenatal clinic in first trimester at Government Maternity Hospital, Pawapuri and fulfilling inclusion criteria were enrolled in the study after institutional ethics approval and consent from the study subjects. Detailed history was taken, regarding the symptoms of thyroid disorders, menstrual history, obstetric history, past medical history, family history, personal and social history. General examination was done with reference to general condition of the patient, body temperature; pulse rate, blood pressure, respiratory rate and the findings were recorded. Systemic examination of the cardiovascular system (CVS), central nervous system (CNS), respiratory system and thyroid gland was done and findings were recorded. Per abdominal and per vaginal examination was done and findings were recorded.

**Specific Investigations:** Patients were sent for the testing of serum TSH level. If serum TSH values were deranged, fT3 and fT4 levels were checked. The reference ranges of the test values used in this study were as per the Guidelines of American Thyroid Association for the Diagnosis and Management of Thyroid Disease during Pregnancy and Postpartum. As per Regulation 14.2 of ATA Guidelines, if trimester-specific ranges for TSH are not available in the laboratory, the following normal reference ranges are recommended: 1<sup>st</sup> trimester – 0.1 to 2.5 m IU/L, 2<sup>nd</sup> trimester – 0.2 to 3.0 m IU/L and 3<sup>rd</sup> trimester – 0.3 to 3.0 m IU/L. Normal free T4 level is 0.7 to 1.8 ng/ml and free T3 level is 1.7 to 4.2 pg/ml. Depending on the hormonal values, patients were classified into

**Subclinical hypothyroidism:** High serum TSH level with normal fT4, fT3 level,

**Overt hypothyroidism:** High serum TSH level with fT4 and fT3 less than normal range.

Sub clinical/ overt hypothyroid cases were treated with Thyroxine.

Sub clinical / overt hyperthyroid cases were treated with Propylthiouracyl.

Every 4 weeks, TSH level was estimated and the dose of the drug was adjusted.

Outcome of the pregnancy was followed up and documented.

The following outcome variables of the pregnancy in relation to the thyroid disorders were studied: Preeclampsia, Abruptio placenta, Preterm delivery, IUGR, Low birth weight, Still birth, Abortion.

## III. Results

In the present study, 116 out of 1000 pregnant women screened had thyroid disorders. The prevalence of thyroid disorders in this study was 11.6%. In the present study, the prevalence of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism is 6.4%, 2.8%, 1.8% and 0.6% respectively as per **Table – 1**. Out of 1000 pregnant women screened, 64 had subclinical hypothyroidism, thus making it the thyroid disorder with highest prevalence in pregnant women. 28 and 18 cases had overt hypothyroidism and subclinical hyperthyroidism respectively. Only 6 pregnant women had overt hyperthyroidism, thus it has the least prevalence of 0.6%. The mean of TSH level in the cases of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism, overt hyperthyroidism was 4.11, 8.86, 0.022, and 0.014 respectively. In the present study, the incidence of maternal complications in the cases of subclinical hypothyroidism was preeclampsia (9.37%), preterm delivery (7.81%), abortions (4.68%) and abruptio placenta (1.56%). In the present study, the incidence of fetal complications in the cases of subclinical hypothyroidism was IUGR (6.25%), low birth weight (4.68%) and still birth (1.56%). In the present study, the incidence of fetal complications in the cases of overt hypothyroidism was IUGR (10.71%), low birth weight (10.71%) and still birth (3.57%). 18 cases of subclinical hyperthyroidism, 2 cases preeclampsia, 1 case had preterm delivery and 1 case had abortion. Thus the incidence of preeclampsia, preterm delivery and abortions was 11.11%, 5.55% and 5.55% respectively. Out of 18 cases of subclinical hyperthyroidism, 2 cases had fetus with IUGR and 1 case had still birth. Thus the incidence of IUGR and still birth in cases of subclinical hyperthyroidism is 11.11% and 5.55% respectively. Incidence of maternal complications in 116 pregnant women with thyroid disorders Preeclampsia (10.34%), Abortion (8.62%), Preterm delivery (7.75%), and Abruptio placenta (1.72%). Incidence of fetal complications in 116 pregnant women with thyroid disorders.

#### IV. Discussion

The present study was done at Department of Obstetrics and Gynecology, V.I.M.SPawapuri. A total of 1000 patients were screened for thyroid disorders in this study. It was prospective study. The main aim of the study was to know the prevalence of thyroid disorders in pregnancy.

The prevalence of thyroid disorders in our study was 10%. Present findings are consistent with Sahu MT et al, who studied 633 women in second trimester. In their study the prevalence of thyroid disorders was also 12.7%, which is comparable to study. The prevalence of subclinical hypothyroidism in our study is 6%. In the study of Sahu MT et al the prevalence was 6.47%, which is comparable to our study.<sup>8</sup> In a study done by Casey BM et al, the prevalence was 2.3% which is very high and not consistent with present study.<sup>9</sup> The prevalence of overt hypothyroidism in present study is 2%, which is partly consistent with the study done by Sahu MT et al, in which the prevalence was 4.58%. The prevalence of subclinical and overt hyperthyroidism in our study is 2% and Nil respectively. In the study done by Sahu MT et al the prevalence was 0.9% and 0.7% for subclinical and overt hyperthyroidism. The prevalence of subclinical and overt hyperthyroidism was 0.5 and 0.4% respectively in the study done by Stagnaro Green A. The prevalence of subclinical hyperthyroidism is comparable with other studies.

At present there are no available recommendations for detection or screening of thyroid dysfunction among Indian pregnant women. Recent consensus guidelines do not advocate universal thyroid function screening during pregnancy but recommend testing for high risk women with personal history of thyroid or other autoimmune disorders or with a family history of thyroid disorders. Our study shows high prevalence of thyroid dysfunction, especially subclinical and overt hypothyroidism among Indian pregnant women.

Based on the results of the present study we therefore suggest for a decrease threshold for screening and detection of thyroid dysfunction among Indian pregnant women attending routine antenatal clinic and to be potentially aware of associated maternal and fetal complications.

#### V. Conclusion

This study showed a high prevalence of thyroid disorder (11.6%) especially hypothyroidism in pregnant women, with the prevalence of subclinical hypothyroidism being 6.4% and overt hypothyroidism being 2.8%. Although hyperthyroidism in pregnancy is uncommon, effects on both the mother and fetus are critical. 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. 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.

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