

## Hypothyroidism in Pregnancy and its Maternal Outcome

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### Abstract

**Introduction:** Hypothyroidism in pregnancy is associated with various adverse maternal outcomes such as increased foetal mortality, miscarriage, premature birth and preeclampsia. In an about 2850 deliveries conducted from Jan 2021 December 2021 at Kottayam medical college, 290 patients were diagnosed with Hypothyroidism. Thus, this study has been necessitated as 10.17% of the pregnant women is affected by hypothyroidism. In this study, we have tried to analyse the maternal out comes associated with hypothyroidism.

**Aim and Objective:** To determine the maternal outcomes observed in hypothyroid mothers presenting at the Obstetric clinic in Government Medical College, Kottayam from Jan-Dec 2021

**Method:** Hospital based retrospective study was conducted among 290 patients admitted from Jan to Dec 2021, in the department of Obstetrics and Gynecology, Government Medical College, Kottayam, Kerala.

**Result:** In our study 10.17% of pregnant woman had hypothyroidism. Out of the 290 cases with hypothyroidism, the mean age of the population was found to be 27.84 years with a standard deviation of +5.084. 14% of the deliveries were preterm 16% had Complication. About 69.31% had presence of some or the other form of risk factors.

**Conclusion:** Hypothyroidism in pregnancy is associated with increased risk of adverse maternal and foetal outcome. It is worth noting that more than 95% of the Prevalence were in patients below 35 years of age. However, a majority of them had one or other complication, associated with it. Screening of patients for hypothyroidism is necessary especially when the patient is having other complications.

**Keywords:** Hypothyroidism, Complications, Pregnancy, Thyroid function

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### Background and Rationale

Pregnancy influences a profound alteration in thyroid function which has an impact on pregnancy outcomes [1,2]. Thyroid hormones play a critical role in fetal neurodevelopment in pregnancy and postnatal life. Hypothyroidism is common in pregnancy and is associated with several adverse maternal and fetal outcome. The benefits of treating hypothyroidism during

pregnancy include improved obstetric outcome [1].

### Review of Literature

Thyroid hormone from the mother is needed for growth and development of the unborn baby. During pregnancy, the amount of thyroid hormone required for both mother and the developing baby increases by 40 percent. Women with

thyroid disease or thyroid destroyed by radioactive iodine or surgically removed, do not have the ability to increase thyroid hormone production as needed. The common symptoms of hypothyroidism include fatigue, weight gain, cold intolerance and constipation [1].

Woman with hypothyroidism need to notify their physician or endocrinologist regarding pregnancy for prompt testing and the dosage adjustment [3]. Additionally, testing blood levels at intervals throughout the pregnancy is crucial to make sure that normal thyroid hormone values are maintained throughout the pregnancy [4,5]. Typically, testing thyroid function during the first half of pregnancy is recommended, with a general goal of maintaining a TSH (thyroid stimulating hormone) blood level less than 2.5mIU/L when on thyroid hormone replacement medication [4]. Thyroid stimulating hormone is made by the pituitary gland in the brain which directs the thyroid to release thyroid hormone into the blood. TSH levels that are too high or too low can indicate poor thyroid function.

Thyroid peroxidase antibody (TPO Ab) is seen in Hashimoto's disease and is important issue during pregnancy. Hashimoto's disease, is the most common cause of hypothyroidism (low thyroid function) and is present when the body's immune system

- Normally designed to detect and attack things like bacteria that don't belong in the body
- Mistakenly sees the thyroid as something "foreign" and makes antibodies that attack the thyroid tissue [2,3]

It is recommended that patients with hypothyroidism who are pregnant be tested not only for their thyroid function (serum TSH), but also for the presence of this TPO antibody. This is because the presence of the TPO antibody appears to increase the risk of miscarriage and other pregnancy complications. There is some clinical data that suggest that thyroid hormone

replacement medication may reduce these pregnancy risks and that if the antibody is present, it is even more important to keep within the TSH range of less than 2.5m/U/L [5].

The most important aspect of caring for pregnant women with hypothyroidism is to ensure they are aware of the importance of notifying their physician if they are planning pregnancy or suspect themselves to be pregnant. Frequent thyroid hormone checks throughout pregnancy, and appropriate adjustments to thyroid medication as is typically needed, can lead to a safe and successful pregnancy [6]. In the last few years, two large studies investigated the utility of such a screening recommendation [7].

The studies showed no benefit to early screening, specifically, the ability to detect, intervene and normalize thyroid function in pregnant women with mild hypothyroidism. Study also did not demonstrate an improved outcome in the IQ of the child, which was the focus of earlier studies theorizing that babies born to mothers with undiagnosed or inadequately treated hypothyroidism are at risk for lower IQ scores and learning disabilities. The study concluded that the reduction in IQ of babies of mothers with subclinical hypothyroidism may be due to prematurity [7]. Because of this, and even though some in medical circles question whether thyroid hormone treatment was started early enough in pregnancy in these studies to have had an impact, current guideline recommendations do not support universal screening of all newly pregnant women for thyroid disease [8,9]. However, the guidelines did support physicians asking all women who are planning pregnancy or are newly pregnant if they have a history of thyroid disease or risk factors for thyroid disease. If risk factors are present, then thyroid testing is recommended. These risk factors include age greater than 35 years old, symptoms which could be related to thyroid dysfunction, symptoms which could be related to thyroid hormone

excess/insufficiency, a family history of thyroid problems, and obesity, among others. Screening for the presence of thyroid disease in patients who are newly pregnant has been an active area of research and interest for many years, since thyroid disease is very common. Furthermore, previous studies have also reported a prevalence of hypothyroidism among pregnant women at 10.5% in Kerala and maternal complications like pre-eclampsia [10,11]. Thus, indicating the need for routine screening of every pregnant woman for thyroid disease.

### Objective

The objective of the study was to determine the maternal outcomes observed in hypothyroid mothers presenting at the Obstetric clinic of the Government Medical College, Kottayam.

### Materials and Methods

#### Type of Study

#### Results

Hospital based retrospective study

#### Period of Study

January to December 2021 (1 year).

#### Study Setting

Govt. Medical College, Kottayam

#### Sample size

290 patients admitted with Hypothyroidism

#### Study Population

Pregnant patients admitted to the O & G department for delivery from Jan to Dec 2021

#### Inclusion Criteria

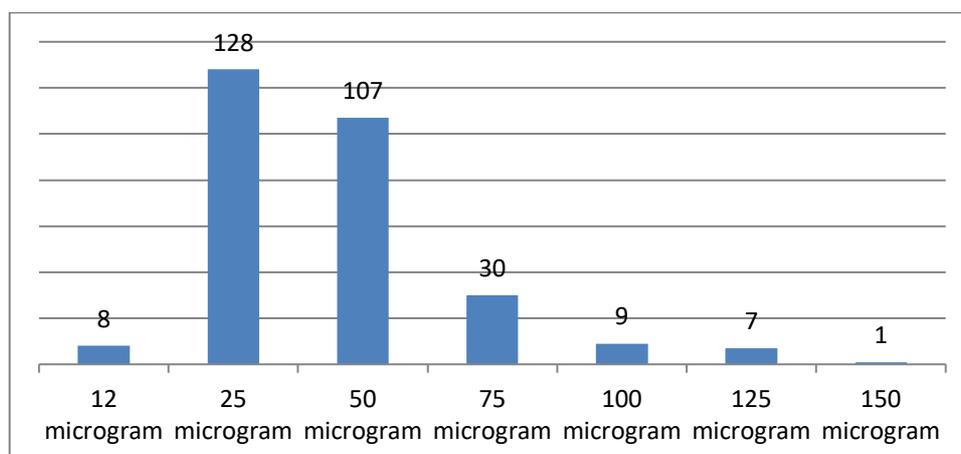
Diagnosis of hypothyroidism in third trimester.

#### Exclusion Criteria

1. Presence of thyroid nodule or other medical conditions, chronic medications containing iodine
2. Patients diagnosed with other comorbidities like Diabetes mellitus, Hypertension, Epilepsy, Heart disease.

**Table 1: Treatment history**

Thyroid hormone (Mcg)	Frequency	Percentage
12	8	2.70
25	128	44.13
50	107	36.89
75	30	10.34
100	9	3.10
125	7	2.40
150	1	0.30

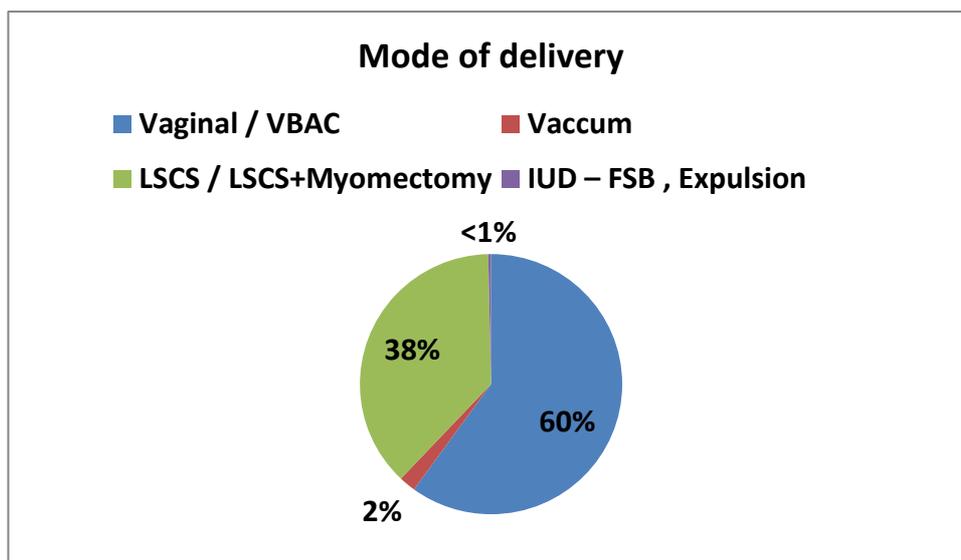


**Figure 1: Treatment history**

**Table 1** above shows the hormone treatment meted out to 290 patients. It can be seen that 128 patients were administered with 25mcg of Thyroid hormone and 107 with 50mcg. The median dosage was found to be 50mcg.

**Table 2: Pregnancy Outcome, Mode of delivery**

Mode of delivery	Frequency	Percentage
Vaginal / Vaginal birth after Caesarean (VBAC)	174	60.00
Vacuum	6	2.06
Lower segment Caesarean section (LSCS)	109	37.58
Intra-uterine death (IUD) , Fresh still Birth (FSB) , Expulsion	1	0.34

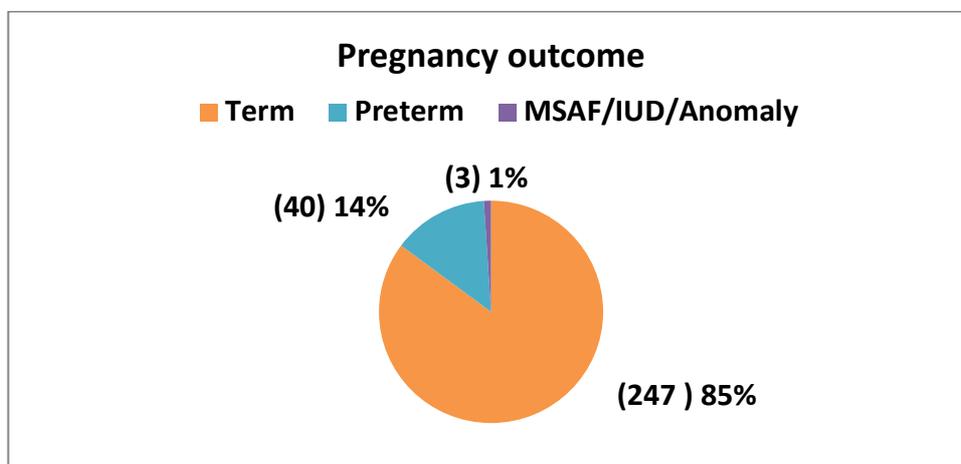


**Figure 2: Mode of delivery**

**Table 2** Shows the mode of delivery outcome. It can be seen that 60% of the deliveries were Vaginal or VBAC. LSCS accounted for 37.5% of the deliveries. Vacuum 2.06% and IUD 0.34% (One patient).

**Table 3: Pregnancy Outcome-Delivery**

Pregnancy outcome	Frequency	Percentage
Term	247	85
Preterm	40	14
MSAF/IUD/Anomaly	3	1

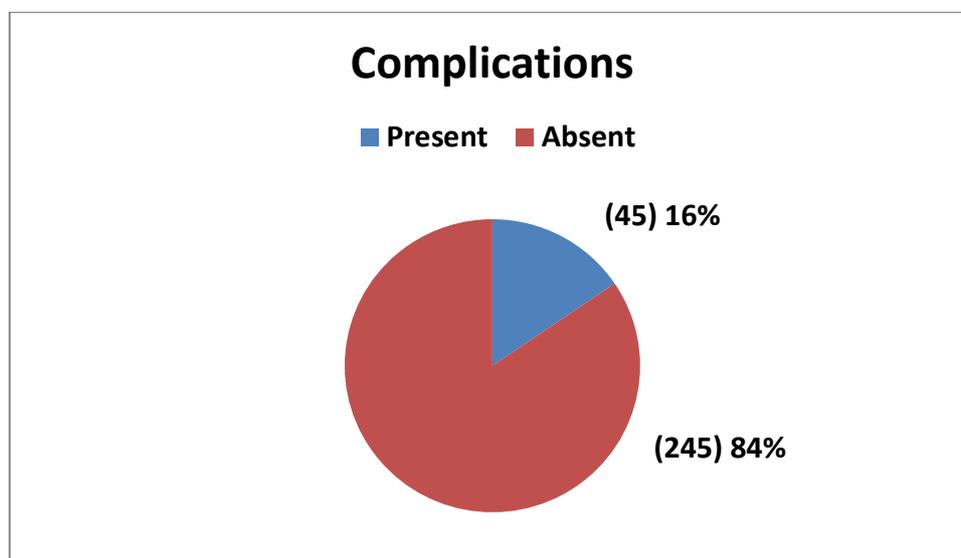


**Figure 3: Pregnancy outcome**

**Table 3** out of 290, 247 (85%) delivered in term. 40 of them were Preterm. MSAF/IUD/Anomaly were detected in 3 cases (1%)

**Table 4: Delivery outcome – complications**

Complications	Frequency	Percentage
Present	45	16
Absent	245	84



**Figure 4**

Table 4: There were complication in 16% (45) of the patients. The complications are outlined below. 85% (245) of the patients did not have any complication.

**Table 5: Complications reported**

Complications	Patients	Percentage
Meconium stained amniotic fluid (MSAF)	23	51.11
Cord around neck	3	6.68
Perennial Tear (PTEAR)	1	2.22
Post-partum haemorrhage (PPH)	6	13.34
Prolonged second stage	1	2.22
Intra uterine growth retardation (IUGR)	1	2.22
Intra uterine death (IUD)	2	4.44
Face to pubis presentation	1	2.22
Foetal Growth retardation (FGR)	1	2.22
Abruption, Antepartum haemorrhage (APH)	2	4.44
3 <sup>rd</sup> degree Perennial Tear (3PT)	4	8.89
<b>Total Complications</b>	<b>45</b>	<b>100</b>

**Table 5** List the complication involved. Out of 290 patients, 45 had complications listed above. It is to be noted that more than 50% had MSAF

## Discussion

A hospital based retrospective study on two hundred and ninety patients with hypothyroidism were taken after fulfilling the Inclusion and exclusion criteria. The mean age of the study subjects was  $27.84 \pm 5.084$ . It was observed that 63.44% (184 patients) were in the age group of 21 to 30 years followed by 28.96% in the age group of 31 to 40 years.

In regards to Antenatal Check-up, 232 (80%) patients were having regular check-up in our institution. 57 (19.65%) number of patients were referred from other hospitals. Only one patient had no regular antenatal check-ups.

Based on Obstetric formula, 41.37% (120 patients) were Primi and 33.44% (97 patients) were Gravida 2. 95% of the patients were below the age of 35 years and 3.79% (11 patients) were Obese. 69% of the patients had the presence of other risk factors such as Gestational Diabetes, Gestational Hypertension, Chronic hypertension, Bronchial Asthma, polyhydramnios anemia oligohydramnios, and IUGR.

16% of the patients had history of miscarriage. 3.79% had history of preeclampsia and less than 1% had family history of Thyroid disease.

Investigations revealed mean value of Free T3 to be 4.31 ng/dl with a standard deviation of  $\pm 0.90$ . Likewise, Free T4 showed a mean of 2.04 ng/dl with a standard deviation of  $\pm 0.71$ . Thyroid stimulating hormone mean was 4.45 with a standard deviation of  $\pm 1.18$ . Based on these values, thyroid hormone treatment was given. The dosage accordingly ranged from 12mcg to 150 mcg.

Pregnancy outcomes in terms of delivery showed 60% (174 Patients) to be Vaginal and 38% through Lower segment Caesarean section (LSCS). Vacuum extraction accounted for 2% (6 patients) and there was one intrauterine death. Overall, 85% of the deliveries were at term.

Delivery complications were reported in 45 cases (16%). These complications included Meconium stained amniotic fluid, Cord around neck, Perennial tear, Post-partum haemorrhage, prolonged second stage, face to pubis presentation, foetal growth retardation, Abruptio, Antepartum haemorrhage and Intra uterine death

## Limitations

One of the limitations of this study is that since the hospital is a tertiary referral centre, there are possibilities of more than usual patients with complication associated with Hypothyroidism being admitted. Secondly, there can also be cases of subclinical hypothyroidism. Nevertheless, this study will hold its merit as these limitations will have only marginal impact on the study

## Conclusion

Hypothyroidism in pregnancy is associated with increased risk of adverse maternal and foetal outcome. It is worth noting that more than 95% of the Prevalence were in patients below 35 years of age. However, a majority of them had one or other complication, associated with it.

Screening of patients for hypothyroidism is necessary especially when the patient is having other complications. It is necessary that patients with hypothyroidism who are pregnant be tested not only for their thyroid function (serum TSH), but also for the presence of this TPO antibody

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## Declarations

Ethical approval: The study was approved by the institutional ethical committee IRB 17/2022

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