

# Incidence of Subclinical Hypothyroidism among First Trimester Primigravida Women in South India

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## ABSTRACT

**Introduction:** Even though thyroid dysfunctions are more common in women, proper care and management are very important during pregnancy. Various studies concluded that clinical thyroid dysfunction is associated with complications like preterm birth low birth weight placental abruption and fetal death. Many studies have done between subclinical hypothyroidism and pregnancy outcomes, but the subject is still in controversy. So we aimed to study the incidence of subclinical hypothyroidism during pregnancy in the first trimester in south India.

**Material and methods:** In this prospective study all the women who presented to Sree Balaji Medical College and Hospital for prenatal care were included and out of 150 female patients 147 were selected and then all the demographic details and history was asked and noted and then undergone diagnostic procedure like TSH assay, free  $T_4$  and the readings were recorded, and results are analyzed.

**Results:** In our study out of 147 female patients based on age distribution 4%(6 patients) were in the age group between 15-20 years, 37%(54 patients) between 21-25 years, 54%(79 patients) between 26-30 years, 5%(8 patients) between 31-35 years and based on TSH cut off values 36%(53 patients) has  $TSH < 2.5 \text{ microunit/l}$  and 64%(94 patients) has  $TSH > 2.5 \text{ microunit/l}$ .

**Conclusion:** From this study, we concluded that the incidence of subclinical hypothyroidism is as high as 36% in India among pregnant women, and maternal age has no correlation with subclinical hypothyroidism. Thus early screening and intervention will drastically reduce the burden of the disease.

**Keywords:** Subclinical, Hypothyroidism, TSH, Trimester.

## INTRODUCTION

Thyroid hormones are very significant during intrauterine life because it involved both directly and indirectly in various metabolic process. They help for the somatic growth and neurological development of the offspring.<sup>1</sup> During pregnancy thyroid hormone level will change because of increased demand to the body.<sup>2</sup>

During pregnancy, the maternal pituitary hypothalamic thyroid system undergoes physiological modifications to adapt to the new situation. In the first trimester of pregnancy human chorionic gonadotropin (HCG) will increases and this hormone have thyrotropin like effect and thus it stimulates the thyroid gland and produce free  $T_4$  which results in decreased production of TSH.<sup>3,4</sup> But the recent studies reported that relationship between HCG and TSH is weaker and it will not influence the thyroid function.<sup>5</sup> Other factors which strongly influence the TSH are BMI, age, ethnicity,

and iodine deficiency in pregnancy<sup>3,5,6,7</sup> and TSH is high in the patient having anti-thyroid peroxidase antibodies.<sup>8</sup> Even though TSH is the very important gestational marker for thyroid status is also very necessary to determine free  $T_4$  because free  $T_4$  enters the fetus during intrauterine life. Subclinical hypothyroidism is a more common thyroid disorder among women of fertile age. It is defined as a raised serum thyroid-stimulating hormone (TSH) above the upper limit of normal with a normal level of free thyroxine ( $T_4$ ). Recent Endocrine Society guidelines suggested 0.1 to 2.5 micro-unit/l as the 'normal' range for TSH values in the first trimester. The prevalence of subclinical hypothyroidism during pregnancy is about 1.5% to 4%.<sup>9</sup> Thyroid gland completely formed by the first trimester of pregnancy. Screening of thyroid hormones in fetus begins from 10 weeks of gestation. Maternal thyroid hormone is very important during the first trimester of pregnancy because it helps in central nervous system development, IQ of the fetus. Several studies stated that mild maternal hypothyroidism would result in neurocognitive problems in the fetus.<sup>10</sup> Numerous studies have shown a significant association between the thyroid dysfunction and perinatal complication like infertility, repeated miscarriages, preterm delivery.<sup>11,12</sup> However the relationship between subclinical hypothyroidism and neurological development in offspring is controversial. Hence the purpose of this study is to analyze the incidence of subclinical hypothyroidism during pregnancy in the first trimester in south India.

## MATERIAL AND METHODS

In this prospective study, all the women who presented to Sree Balaji Medical College and Hospital for prenatal care were included, and out of 150 female patients 147 were selected and studied under different study parameters like age and TSH level. Inclusion criteria include the first trimester of pregnancy, no history of thyroid dysfunction, no other medical diseases complicating the pregnancy and no history of drug intake, which will affect the thyroid function test

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like antipsychotics. Exclusion criteria include that patients who were not fulfilling the inclusion mentioned above were excluded from the study. Then all the demographic details like maternal age, initial weight and height, parity, prior or current pregnancy complications and BMI was collected by interview and physical examination of all patients. Patients were also asked about previous abortion, preterm delivery and family history of thyroid diseases. A maternal blood sample was collected from all female patients Serum TSH, was measured by automated electrochemiluminescent immunoassays, and the readings were recorded.

## RESULTS

In our study out of 147 female patients based on age distribution, 4% (6 patients) were in the age group between 15-20 years, 37% (54 patients) between 21-25 years, 54% (79 patients) between 26-30 years, 5% (8 patients) between 31-35 years. (Fig.1) In our study out of 147 female patients based on TSH cut off values 36% (53 patients) has TSH< 2.5micrount/l and 64% (94 patients) has TSH>

S. No	TSH values	Percentage
1	< 2.5 micro unit/l	36%
2	>2.5 micro unit/l	64%

Table-1: Distribution of tsh value

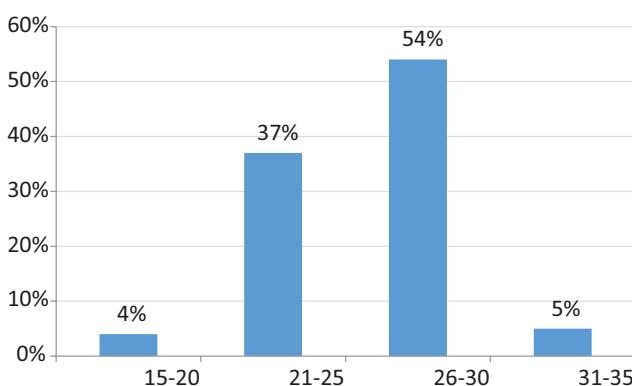


Figure-1: Distribution of age group

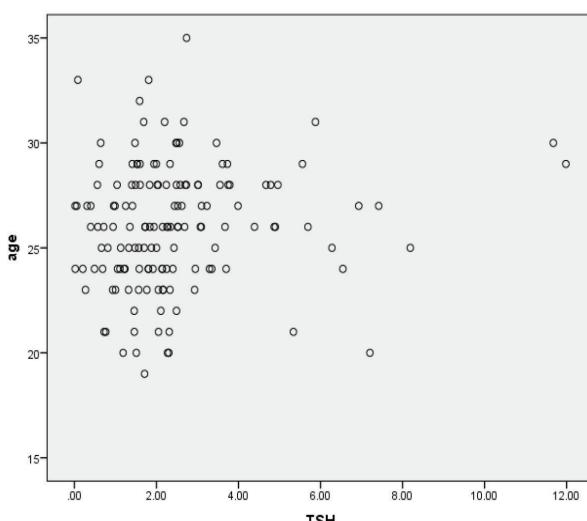


Figure-2 Correlation between TSH and maternal age

2.5micrount/l.(table1) There was a weak linear correlation noted between TSH and maternal age.

## DISCUSSION

Recent studies about the prevalence of hypothyroidism in pregnancy were 12.3% in Finnish, 15.5% in America, 35.3% in South America.<sup>13,14,15</sup> Similarly a small study conducted by us, in which we measured thyroid function tests in the first trimester among 200 pregnant women and found that 16.5% of women had TSH levels > 4 micro-unit/L and 53.5% had TSH levels ≥ 2 micro-unit/L.<sup>16</sup> Another small study from Delhi involving 172 normal pregnant women in the first trimester (thyroid normalcy suggested by negative thyroid antibodies, clinical assessment, iodine sufficiency, and routine thyroid ultrasound) revealed that the first-trimester range of TSH in Indian women to be between 0.6-5.0 micro-unit/L.<sup>17</sup>

Dhanwal and colleagues from Delhi published in the March issue of the journal.<sup>18</sup> Using a TSH cut-off of 4.5 micro-unit/L, they demonstrated a prevalence of hypothyroidism of 14.3% in the first trimester of pregnancy. The mean first trimester TSH value among the 1000 pregnant women was 3.68 micro-unit/L and was similar to the previously mentioned study by Marwaha and colleagues from Delhi.<sup>17</sup> In the study by Dhanwal *et al.*, using the Endocrine Society first trimester cut-off for the diagnosis of SCH (>2.5 micro-unit/L) would have led to over 50% of pregnant women in Delhi being diagnosed with SCH. The Society guidelines suggest that all those diagnosed with SCH in pregnancy should be offered treatment regardless of thyroid antibody status, despite no current evidence of benefits because the risks would be negligible.<sup>19</sup>

In our study out of 147 female patients based on age distribution, 4% (6 patients) were in the age group between 15-20 years, 37% (54 patients) between 21-25 years, 54% (79 patients) between 26-30 years, 5% (8 patients) between 31-35 years. Thus the incidence of subclinical hypothyroidism in India among pregnant women during the first trimester is more common among the age group between 26-30 years.

In our study out of 147 female patients based on TSH cut off values 36% (53 patients) has TSH< 2.5micrount/l and 64% (94 patients) has TSH> 2.5micrount/l. Thus the incidence of asymptomatic subclinical hypothyroidism is as high as 36% in India among pregnant women during the first trimester. (fig2)

## CONCLUSION

From this study, we concluded that incidence of subclinical hypothyroidism is as high as 36% in India among pregnant women and most common age group affected is between 26-30 years and maternal age has no correlation with subclinical hypothyroidism. Thus early screening and intervention will drastically reduce the burden of the disease.

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