

# Prevalence of hypothyroidism in pregnancy

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## Abstract

**Background:** Maternal hypothyroidism may place the mother at an increased risk of adverse obstetrical outcomes. Untreated hypothyroidism is associated with increased risk for preeclampsia, low birth weight, placental abruption, miscarriage, and perinatal mortality. Maternal hypothyroidism is a common clinical problem and its early detection is very important. **Aim of the study:** To study prevalence of hypothyroidism in pregnancy at Cure well Hospital, Srinivas Colony, Warangal, Telangana. **Material and Methods:** This was a prospective cross sectional study done on 76 pregnant women at department of obstetrics and gynecology at Cure Well Hospital, Srinivas Colony, Warangal, Telangana for duration of six months. **Results:** The prevalence of hypothyroidism was 11% in our study. 51.3% cases were among 18-24 years followed by 42.1% among 26-30 years and 60.5% had subclinical hypothyroidism, 39.4% had overt hypothyroidism. Primigravidae were more commonly affected by hypothyroidism in pregnancy. **Conclusion:** The over all prevalence of hypothyroidism in pregnancy is quite high and maternal hypothyroidism is mostly seen in primigravida cases. Early detection, prompt initiation of treatment and adequate follow-up of hypothyroidism in pregnancy is very important for the fetal and maternal well being.

**Key Words:** Hypothyroidism, Serum TSH, Primigravida, Subclinical hypothyroidism

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## INTRODUCTION

Pregnancy is a physiological state of complex metabolic stress that involves significant changes in hormonal milieu. It has a profound influence on thyroid gland structure as well as function. Hypothyroidism during pregnancy constitutes a significant health challenge, as it is associated with adverse maternal outcome along with an impact on neonatal cognitive development. The foetal thyroid gland starts to function only after 12-14 weeks of gestation. As a consequence, the growing foetus remains dependent upon

maternal thyroid hormones during this phase of early gestation.<sup>1,2</sup> Thyroid hormones (thyroxine and triiodothyronine) are vital for normal foetal neurological development<sup>3,4</sup> and decreased levels predispose the child to develop cognitive delay in early adolescence.<sup>5</sup> The prevalence of hypothyroidism during pregnancy is variable, and this variability is mostly attributed to differences in geographical areas, analytical measurement and trimester-specific TSH limits used in diagnosis.<sup>6</sup> In general, the prevalence rates were estimated to be 0.25%-2.5% for subclinical hypothyroidism (SCH), 0.2%-0.3% for overt hypothyroidism (OH)<sup>7</sup> and 5%-15% for euthyroidism with autoimmune disease.<sup>8</sup> Classification of hypothyroidism recognized during pregnancy is essential for epidemiological as well as clinical reasons. The American Thyroid Association (ATA) has defined hypothyroidism during pregnancy as the state of increased TSH level when other rare causes, such as TSH-secreting pituitary tumor and thyroid hormone resistance are excluded. Primary maternal hypothyroidism (MH) observed during pregnancy should be distinguished from preexisting hypothyroidism diagnosed prior to the

pregnancy. Two main varieties of primary MH are recognized by the ATA: overt hypothyroidism (OH) and subclinical hypothyroidism (SCH) based on the presence of elevated TSH and whether FT<sub>4</sub> level is decreased or within normal range. However, cases of isolated hypothyroxinaemia (IH) with normal TSH have also been recognized by the ATA as a third sub-type of MH.<sup>9</sup> Women with hypothyroidism have decreased fertility; even if they conceive, risk of abortion is increased, and risk of gestational hypertension, anemia, abruptio placenta and postpartum hemorrhage are increased.<sup>10</sup> A number of pioneering studies by Man *et al.*,<sup>11</sup> Haddow *et al.*,<sup>12</sup> and newer studies by Rovet *et al.*<sup>13</sup> and Pop *et al.*,<sup>14</sup> have conclusively proven that children born to mothers with hypothyroidism have a significantly increased risk of impairment in intelligence quotient (IQ) scores, neuropsychological developmental indices and learning abilities.

### AIM OF THE STUDY

To study the prevalence of hypothyroidism in pregnancy at Cure Well Hospital, Srinivas Colony, Warangal, Telangana.

### MATERIALS AND METHODS

This was a prospective cross-sectional study done over a period of six months from August 2019 to February 2020. All consecutive pregnant women who gave written consent were included in the study.

The present study included pregnant women aged 18-35 years and presenting at first trimester of pregnancy attending the antenatal clinic in Obstetrics department of Cure Well Hospital, Warangal Telangana.

No ethical issues were involved in the study.

### METHODOLOGY

Pregnant women included in the study were selected randomly.

A questionnaire was prepared and detailed history was taken from all the pregnant women including age of the woman, gestational age, parity, menstrual history, obstetrics history, history of past illness if any, history of any drug intake and others. A total of 664 pregnant women attended antenatal clinical at our hospital during the study period of which 76 pregnant women had elevated TSH and these 76 women were considered for the present study. They were divided into 2 groups based on FT<sub>3</sub> and FT<sub>4</sub> status into Subclinical hypothyroids (SCH) and overt hypothyroids (OHT). General examination was done and the blood samples from all the cases were sent for investigations such as routine investigations of complete blood picture (CBP) and complete urine analysis (CUE), blood group and Rh typing. Biochemical investigations

included thyroid function test and fasting blood sugar, total cholesterol, triglycerides, serum creatinine, and blood urea nitrogen. Estimation of thyroid stimulating hormone (TSH), free T<sub>4</sub>, and anti-TPO antibodies was carried out using Chemiluminescence immunoassay (CLIA) technology.

### Inclusion criteria:

- Pregnant women who are willing to participate in the study
- Age 18 years to 35 years
- Pregnant women with clinical history of hypothyroidism
- Pregnant women with raised TSH and normal T<sub>3</sub> or T<sub>4</sub>
- Pregnant women with raised TSH and low T<sub>3</sub> or T<sub>4</sub>

### Exclusion criteria:

- Patients who are unwilling to participate in the study
  - Age less than 18 years and more than 35 years
  - Pregnant women with raised T<sub>3</sub> or T<sub>4</sub> levels
  - Pregnant women with other medical history
- Data was entered into excel sheets and the percentages and ratios were calculated.

### RESULTS

A total 76 cases were included in the study. The age ranged from 18 to 35 years and the mean age of the study population was 23.5 years. Serum TSH value was tested in 1st trimester between 6-10 weeks period of gestation for all pregnant women. The estimation of free T<sub>4</sub> levels was done to reclassify those with thyroid dysfunction as subclinical or overt hypothyroidism.

**Table 1: Age distribution**

| Age distribution | No. of cases | Percentage (%) |
|------------------|--------------|----------------|
| 18-24 years      | 39           | 51.3%          |
| 26-30 years      | 32           | 42.1%          |
| 31-35 years      | 05           | 6.5%           |
| <b>Total</b>     | <b>76</b>    | <b>100%</b>    |

In the present study age ranged from 18 to 35 years. Majority were among the 18-24 years age group. Least number of hypothyroid pregnant women were in the 31-35 years age group.

**Table 2: Distribution according to parity**

| Gravida      | No. of cases | Percentage (%) |
|--------------|--------------|----------------|
| Primigravida | 48           | 63.1%          |
| Multigravida | 28           | 36.8%          |
| <b>Total</b> | <b>76</b>    | <b>100%</b>    |

In the present study, majority were primigravida, 63.1% (48/76) and 36.8%(28/76) were multigravida.

**Table 3: Distribution according to thyroid function status**

| Thyroid status          | No. of cases | Percentage (%) |
|-------------------------|--------------|----------------|
| Subclinical hypothyroid | 46           | 60.5%          |
| Overt hypothyroid       | 30           | 39.4%          |
| <b>Total</b>            | <b>76</b>    | <b>100%</b>    |

Subclinical hypothyroidism cases were more common than overt hypothyroidism.

#### PREVALENCE:

The prevalence of hypothyroidism was 11 %

Prevalence: Total number of cases with hypothyroidism x 100/

Total number of pregnant cases = 76 x100

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664

= 11%

Prevalence of subclinical hypothyroidism was 6.05%.

Prevalence of overt hypothyroidism was 3.94%.

#### DISCUSSION

**Comparative studies related to age distribution:** In the present study, majority of the cases were among 18-24 years, ie. 51.3% (39/76), followed by 26-30 years ie, 42.1% (32/76). The mean age of the study population was 23.5 years. In the study by Kiran *et al.*<sup>15</sup> they observed majority of cases in advanced age group ie, in the 26-33 years age group ie, 403 (56.9%) cases, and next common age group was 34 to 40 years with 200 (28.2%) cases. In the study by Dhanwal DK *et al.* study<sup>16</sup> the mean age of the study population was 25.5 ± 5.6 years whereas in our study, the mean age of study population was 23.5 years.

**Comparative studies related to gestational age:** In the present study, majority of the women 63.1% (48/76) were primigravida, and 36.8% (28/76) were multigravida. Similar findings were observed in a study by Chandrasekhara P *et al.*<sup>17</sup> where 175 (42.78%) patients were primigravida and 234 (57.22%) patients were multigravida. Kiran *et al.*<sup>15</sup> in their study reported 221 (32.2%) as primiparous and 110 (16.0%) as multiparous. Our findings compare well with the above studies.

**Comparative studies related to hypothyroidism:** In our study, we observed 60.5% (46/76) cases having subclinical hypothyroidism, 39.4% (30/76) cases having overt hypothyroidism and 08 cases (10%) of hypothyroid pregnant women who were positive for anti-TPO antibodies of which 05 had subclinical hypothyroidism and 03 had overt hypothyroidism. In the study done by Chandrasekhara P *et al.*<sup>17</sup> they observed 20 cases (83.33%) as subclinical hypothyroidism and 04 (16.77%) cases as overt hypothyroidism and 06 (25%) cases had raised anti TPO levels of which 03 had subclinical hypothyroidism and 03 had overt hypothyroidism. Whereas, Dhanwal DK *et al.*<sup>16</sup> reported 13.1% of pregnant women to be hypothyroid (n = 388) and 40% (n = 155) of hypothyroid pregnant women were positive for anti-TPO antibodies. Kiran *et al.*<sup>15</sup> observed that hypothyroidism diagnosed during pregnancy Uncategorized was 14 (2.0%), Overt hypothyroidism was 13 (1.8%) and Subclinical hypothyroidism was 43 (6.1%).

**Comparative studies related to prevalence:** In the present study, the prevalence of hypothyroidism was 11%. In the study done by Pillai NS *et al.*<sup>18</sup> the prevalence of thyroid dysfunction was 10.8%, whereas, Agrawal U *et al.*<sup>19</sup> observed the prevalence of hypothyroidism in pregnancy around 2.5% and Dhanwal DK *et al.*<sup>16</sup> reported the prevalence of hypothyroidism as 15.1% in first trimester. In the study by Goel P *et al.*<sup>20</sup> the overall prevalence of hypothyroidism was 6.3% (overt 2.9% and subclinical 3.4%) in pregnancy. The prevalence of hypothyroidism was comparable to the other studies.

#### CONCLUSION

The overall prevalence of hypothyroidism in pregnancy is quite high and maternal hypothyroidism is mostly seen in primigravida cases. Early detection, prompt initiation of treatment and adequate follow-up of hypothyroidism in pregnancy is very important for the fetal and maternal well being.

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