A Study on the Prevalence of Hypothyroidism and Fetomaternal Outcomes in Pregnant Patients Attending a Tertiary Care Hospital

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Abstract

This prospective study was carried out in Gauhati Medical College and hospital from April 2018 to May 2019. The main aim of the study was to find the prevalence of hypothyroidism, overt hypothyroidism and subclinical hypothyroidism in patients attending antenatal OPD and their fetomaternal outcomes. The study was done in 400 women with single pregnancy of age 18-35 years with no associated medical illness and no prior history of hypothyroidism with informed consent. Serum TSH was done in first visit and patients with raised TSH were advised fT3, fT4 and anti TPO antibody and were followed up till their delivery. The prevalence of hypothyroidism is high (46.75%). There is significant increase in spontaneous abortion (p=0.013), gestational hypertension (p=0.025), preterm birth (p=0.008) and neonatal jaundice (p=0.039) in hypothyroid cases. There is increased incidence of spontaneous abortion (p=0.009) and still birth (p=0.003) in anti TPO antibody positive cases.

Keywords: Pregnancy, Hypothyroidism, Subclinicallyhypothyroidism, OvertHypothyroidism, Euthyroidism.

INTRODUCTION

The prevalence of hypothyroidism during pregnancy is estimated as 0.3-0.5% for overt hypothyroidism and 2-3% in subclinical hypothyroidism (SCH) [1, 2]. Levothyroxine requirement in pregnancy increases to about 25-30% and in some cases to about 50% [3, 4]. Women with hypothyroidism should have TSH and fT4 checked once pregnancy is confirmed. Thyroid function tests should be checked every 4-6 weeks until TSH becomes normal.

Serum TSH concentration is the initial and the most reliable test for assessing thyroid function in pregnancy [5]. Pregnancy is a state of increased thyroid hormone demand which leads to an increase in thyroid hormone synthesis by as much as 50% [3, 4].

The most common cause of OH in pregnancy is chronic autoimmune thyroiditis (HASHIMOTO’S THYROIDITIS). Subclinical hypothyroidism in pregnancy is associated with eclampsia, placental abnormalities, miscarriage, preterm labour and low birth weight.

A high serum TSH suggests hypothyroidism and measurement of serum fT4 levels distinguish between subclinical hypothyroidism (SCH) and overt hypothyroidism (OH), depending on whether fT4 is normal or below normal for gestational age. Determination of thyroid antibodies, thyroid peroxidase (TPO-Ab) and thyroglobulin (TG-Ab) confirms the autoimmune origin of the disorder [6].

OBJECTIVES

1. To find the prevalence of hypothyroidism in pregnant patients attending GMCH.
2. To find the maternal and fetal outcomes of subclinical and overt hypothyroidism.

MATERIALS AND METHODS

The study was conducted in Obstetrics and Gynaecology department in Gauhati Medical College and Hospital from April 2018 to May 2019.

400 cases attending antenatal OPD were taken and patients with high TSH were advised fT3, fT4 and anti TPO antibody and were followed up till delivery.
CASE SELECTION

Inclusion Criteria
- Pregnant females with single intra uterine pregnancy.
- Age 18 to 35 years.

Exclusion Criteria
- Pregnant women with known hypothyroidism on medication.
- Pregnant women with associated medical illness.
- Pregnant women not willing to give consent.
- Drop outs.
- Non co-operative patients.

RESULTS AND DISCUSSION

MEAN AGE
In our study, patients were from 18-35 years and mean age is 24.88±4.14 years. Das Diganta et al. [7] found mean age 23.93±4.44 years. Nambiar Vimal et al. [8] found mean age as 25.19±4.17 years.

PREVALENCE OF HYPOTHYROIDISM
The prevalence of hypothyroidism in this study is 46.75% out of which 37.25% were subclinical hypothyroid and 9.50% were overt hypothyroid. Das Diganta [7] found 52.01% had subclinical hypothyroidism and 1.72% had overt hypothyroidism. Rooplekha Chauhan et al., [9] found the prevalence of hypothyroidism as 23.6% where 21.6% were subclinical hypothyroid and 2% were overt hypothyroid. The prevalence of hypothyroidism in our study is high as Assam falls under the endemic goitre belt.

SPONTANEOUS ABORTION AND HYPOTHYROIDISM
Spontaneous abortion seen in 20.2% euthyroid cases, 44.7% overt hypothyroid cases and 24.2% subclinical hypothyroid cases. Anupama Dave [10] found 2.2% cases had spontaneous abortion of which 28.5% cases were euthyroid and 71.4% cases were hypothyroid (p=0.001).

Table 1: Spontaneous Abortion and Hypothyroidism

<table>
<thead>
<tr>
<th>SPONT ABORTION</th>
<th>Euthyroid</th>
<th>Overt Hypothyroid</th>
<th>Subclinical Hypothyroid</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>170(79.8%)</td>
<td>22(55.3%)</td>
<td>111 (75.80%)</td>
<td>303</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>43 (20.2%)</td>
<td>16(44.7%)</td>
<td>38 (24.20%)</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>213 (100%)</td>
<td>38 (100%)</td>
<td>149 (100%)</td>
<td>400</td>
<td>0.013</td>
</tr>
</tbody>
</table>

PRETERM DELIVERY AND HYPOTHYROIDISM
In our study 12.2% euthyroid cases, 31.6% overt hypothyroid cases and 18.8% subclinical hypothyroid cases had preterm delivery. Deepika Sharma et al., [11] found that 20% cases of subclinical hypothyroidism and 33.3% cases of overt hypothyroidism had preterm delivery.

Table 2: Preterm Delivery & Hypothyroidism

<table>
<thead>
<tr>
<th>GESTATIONAL AGE</th>
<th>EUTHYROID</th>
<th>OVERT HYPOTHYROID</th>
<th>SUBCLINICAL HYPOTHYROID</th>
<th>TOTAL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TERM</td>
<td>187(87.8%)</td>
<td>26(68.4%)</td>
<td>121(81.2%)</td>
<td>334</td>
<td></td>
</tr>
<tr>
<td>PRETERM</td>
<td>26(12.2%)</td>
<td>12 (31.6%)</td>
<td>28 (18.8%)</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>213(100%)</td>
<td>38 (100%)</td>
<td>149 (100%)</td>
<td>400</td>
<td>0.008</td>
</tr>
</tbody>
</table>

GESTATIONAL HYPERTENSION (PIH) WITH HYPOTHYROIDISM
In our study PIH is seen in 19.7% euthyroid cases, 26.3% overt hypothyroid cases and 32.2% SCH cases. Deepika Sharma et al., [11] found relation between preeclampsia and hypothyroidism and found 33.3% cases of hypothyroidism had preeclampsia.

Table 3: PIH WITH HYPOTHYROIDISM

<table>
<thead>
<tr>
<th>GESTATIONAL HYPERTENSION (PIH)</th>
<th>EUTHYROID</th>
<th>OVERT HYPOTHYROID</th>
<th>SUBCLINICAL HYPOTHYROID</th>
<th>TOTAL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL BP</td>
<td>171(80.3%)</td>
<td>28(73.7%)</td>
<td>101(67.8%)</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>PIH (≥140/90mmHg)</td>
<td>42(19.7%)</td>
<td>10(26.3%)</td>
<td>48(32.2%)</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>213(100%)</td>
<td>38 (100%)</td>
<td>149(100%)</td>
<td>400</td>
<td>0.025</td>
</tr>
</tbody>
</table>

NEONATAL JAUNDICE AND HYPOTHYROIDISM
In our study neonatal jaundice seen in 32.4% euthyroid, 31.6% overt hypothyroid and 41.6% Subclinical hypothyroid cases. Sumangala Devi [12] found that 6% babies with neonatal jaundice had hypothyroid mothers and rest babies had euthyroid mothers.
### Table 4: Neonatal Jaundice and Thyroid Status of Mother

<table>
<thead>
<tr>
<th>NEONATAL JAUNDICE</th>
<th>EUTHYROID</th>
<th>OVERT HYPOTHYROID</th>
<th>SUBCLINICAL HYPOTHYROID</th>
<th>TOTAL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>144(67.6%)</td>
<td>26(68.4%)</td>
<td>87(58.4%)</td>
<td>257</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>69(32.4%)</td>
<td>12(31.6%)</td>
<td>62(41.6%)</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>213(100%)</td>
<td>38(100%)</td>
<td>149(100%)</td>
<td>400</td>
<td>0.039</td>
</tr>
</tbody>
</table>

### Table 5: Anti TPO Positivity and Spontaneous Abortion

<table>
<thead>
<tr>
<th>SPONTANEOUS ABORTION</th>
<th>NORMAL(&lt;34UL/ml)</th>
<th>RAISED(≥34UL/ml)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>124(74.70%)</td>
<td>10(47.60%)</td>
<td>134</td>
</tr>
<tr>
<td>YES</td>
<td>42(25.30%)</td>
<td>11(52.40%)</td>
<td>53</td>
</tr>
<tr>
<td>TOTAL</td>
<td>166(100)</td>
<td>21(100)</td>
<td>187</td>
</tr>
</tbody>
</table>

### Table 6: Anti TPO Positivity and Fetal Outcome

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>ANTI TPO NEGATIVE</th>
<th>ANTI TPO POSITIVE</th>
<th>TOTAL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUD</td>
<td>9(69.2%)</td>
<td>4(30.80%)</td>
<td>13(100%)</td>
<td>0.003</td>
</tr>
<tr>
<td>LIVE</td>
<td>152(91.6%)</td>
<td>14(8.40%)</td>
<td>166(100%)</td>
<td></td>
</tr>
<tr>
<td>STILLBORN</td>
<td>5(62.5%)</td>
<td>3(37.5%)</td>
<td>8(100%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>166</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SPONTANEOUS ABORTION AND ANTI TPO POSITIVITY

In our study there is increased incidence of spontaneous abortion in cases with raised anti TPO antibody (52.40%). Leguene et al., [13] found that elevated anti TPO antibody are associated with increased miscarriage rate. Stagnaro Green [14] found anti TPO antibody positive women miscarried at a rate of 17% as compared to 8.4% of anti TPO antibody negative women.

### ANTI TPO POSITIVITY AND FETAL OUTCOME

It is seen that those with stillborn (37.5%) have higher anti TPO antibody positivity followed by IUD (30.8%) and liveborn (8.40%). Gupta et al., [15] found that patients having anti TPO antibody positive values had increased incidence of IUD (20.43%)

### MATERNAL EFFECTS OF HYPOTHYROIDISM

Among hypothyroid cases, 55.2% cases had spontaneous abortion, 58% cases had gestational hypertension, 55% cases had gestational diabetes mellitus, 35.3% cases had abruptio placenta and 59.5% cases had post partum haemorrhage.

### FETAL EFFECTS OF HYPOTHYROIDISM

Out of hypothyroid cases, 53.1% babies had low birth weight, 50% babies were IUFD, 61.5% babies were Stillborn, 52.9% babies had NICU admission, 60.6% babies had preterm birth, 50.5% babies had meconium stained liquor and 51.7% babies had neonatal jaundice.

### CONCLUSION AND RECOMMENDATIONS

Our study concludes that:
- The prevalence of hypothyroidism in pregnancy is high (46.75%).
- There is significant increase in spontaneous abortion, gestational hypertension, preterm birth & neonatal jaundice in hypothyroid cases.
- There is increased incidence of spontaneous abortion and still birth in anti TPO antibody positive cases.

Maternal hypothyroidism is a disorder having great potential to adversely affect both the maternal and fetal outcome. In view of the high prevalence of
hypothyroidism in our study and its association with adverse complications, we recommend routine screening for thyroid dysfunctions in pregnancy.

REFERENCES


