INCIDENCE OF SUBCLINICAL HYPOTHYROIDISM IN FIRST TRIMESTER OF PREGNANCY IN MANGALORE POPULATION

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ABSTRACT

Hypothyroidism is not routinely evaluated during pregnancy. This study thrives to screen for hypothyroidism in pregnancy in the 1st trimester, and to treat the hypothyroidism as early as possible to prevent impaired neuropsychological development in the fetus. The present study is a cross sectional based hospital study that included 100 pregnant women in first trimester. All pregnant women in first trimester, convening to the inclusion criteria were analysed for FT3, FT4, TSH test at first visit. TSH of 0.1 to 2.5 u IU/L in first trimester was taken as normal value. Anti Thyroid Peroxidase(TPO) levels were done for patients diagnosed as having subclinical hypothyroidism. Based on this finding the treatment should be given to the pregnant woman as early as possible to prevent impaired neuropsychological development in the fetus.

Key Words: Hypothyroidism, Anti TPO antibody, 1st Trimester.

INTRODUCTION

Hypothyroidism is a clinical syndrome resulting from deficiency of thyroid hormones, which in turn results in a generalized slowing down of metabolic processes[1]. Pathology of the thyroid gland (Primary hypothyroidism) accounts for over 99.5% of cases of thyroid gland failure and < 0.5% result from disorder of the pituitary gland or hypothalamus (central hypothyroidism)[2-3]. Overt hypothyroidism refers to cases in which the serum thyroid stimulating hormone (TSH) concentration is elevated and serum T4 (free thyroxine) is below...
the reference range. Subclinical hypothyroidism is defined as a serum thyroid stimulating hormone (TSH) above the defined upper limit of the reference range, with a serum free thyroxine (T4) within the reference range. The progression to overt hypothyroidism is approximately 2–5% per year\textsuperscript{[4]}. 

Pregnancy is associated with significant but reversible changes in thyroid function which are a result of normal physiologic state and hormonal changes that alter thyroid function\textsuperscript{[5]}. These changes mean that laboratory tests of thyroid function must be interpreted with caution during pregnancy\textsuperscript{[6]}.. Human chorionic gonadotropin can weakly turn on the thyroid and the high circulating hCG levels in the first trimester may result in a slightly low thyroid stimulating hormone (TSH) in the first trimester and then return to normal throughout the duration of pregnancy\textsuperscript{[5]}. TSH suppression is a transient phenomenon and TSH concentrations generally remain within non pregnant reference intervals in normal pregnancy\textsuperscript{[7]}.. Thyroid function is frequently assessed during pregnancy, both to evaluate suspected thyroid abnormalities, and to monitor the status of pre-existing thyroid disease\textsuperscript{[8]}.. As thyroid disorders are the most common endocrinology disorders of childbearing age\textsuperscript{[9]}.. Hypothyroid state in pregnancy is associated with maternal and fetal complications, including the outcome of delivery and a risk factor for impaired neuropsychological development of the fetus. Prompt treatment significantly reduces these complications. Hence early diagnosis of hypothyroidism and initiation of treatment is necessary. Not much clinical studies have been done on screening of hypothyroidism in pregnancy. Hence the present study was aimed to investigate the incidence of hypothyroidism in pregnancy in the 1st trimester so that treatment is given as early as possible to prevent impaired neuropsychological development in the fetus.

**MATERIALS AND METHODS**

The present study is a cross sectional based hospital study that included 100 pregnant women in first trimester, convening to the inclusion criteria were enrolled into the study after being explained the proceedings of the study and after they signed the consent form. The mean age of pregnant women was 27.67 years and the mean of gestational age of the pregnant women was 9.80 weeks. All pregnant women in first trimester, convening to the inclusion criteria were analysed for FT3, FT4, TSH test at first visit. TSH of 0.1 to 2.5 u IU/L in first trimester was taken as normal value. Anti TPO levels were done for patients diagnosed as having subclinical hypothyroidism. Patients diagnosed to have overt hypothyroidism
Table 1: Age and gestational age

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs) (n=100)</td>
<td>19</td>
<td>38</td>
<td>27.67±4.29</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>6</td>
<td>12</td>
<td>9.80±1.46</td>
</tr>
</tbody>
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Table 2: Serum TSH, FT3 and FT4 status in study population (n=100)

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH (mic IU/ml)</td>
<td>0.0050</td>
<td>16.12</td>
<td>1.73±1.95</td>
</tr>
<tr>
<td>Free T3 (pg/ml)</td>
<td>1.76</td>
<td>5.77</td>
<td>3.33±0.67</td>
</tr>
<tr>
<td>Free T4 (ng/dl)</td>
<td>0.80</td>
<td>2.75</td>
<td>1.31±0.23</td>
</tr>
</tbody>
</table>

Figure 1 Thyroid status in study population (n =100)

Figure 2 Incidence of Hypothyroidism in population
RESULTS
Amongst 100 pregnant women in this study, The mean age was 27.67 years and the mean of gestational age of the pregnant women was 9.80 weeks (Refer table 1) and 7% of the study population had hypothyroidism (Figure 1), of which 71% had subclinical hypothyroidism (Figure 2) and 60% were positive for anti TPO antibody (figure 3). 3% had isolated hypothyroxinemia and 1% of the study population had subclinical hyperthyroidism and 1% had primary hyperthyroidism.

DISCUSSION
It is known that the thyroid physiology significantly changes during pregnancy and the fetus is solely dependant on maternal thyroxine during early gestation [10]. The thyroid dysfunction in pregnancy if left untreated has adverse effects on maternal and fetal wellbeing. In the present study 7% of the study population had hypothyroidism, of which 71% had subclinical hypothyroidism and 60% were positive for anti TPO antibody. 3% had isolated hypothyroxinemia and 1% of the study population had subclinical hyperthyroidism and 1% had primary hyperthyroidism. In a study done by Radi.R.A.A and Shubair.M.E. In Rimal health centre, Gaza city, hypothyroidism was observed in 2.2% of pregnant women and hyperthyroidism in 1% of pregnant women. Similar results were found in a study done by Woeber K. The incidence of hypothyroidism in pregnancy varied from 2.2% to 7% in various studies, in the present study the incidence of hypothyroidism in pregnancy was 7%. These variations in the incidence were probably due to the geographic and racial differences and probably due to lack of awareness of hypothyroidism in pregnancy and limited resources available for screening of hypothyroidism in pregnancy. The study concludes that, the incidence of hypothyroidism in pregnancy is significant and as discussed earlier
hypothyroidism in pregnancy is significantly associated with maternal and fetal complications, if left untreated. Early detection of hypothyroidism in pregnancy by screening of thyroid functions, especially in the first trimester when the fetus is said to be solely dependent on maternal thyroxine and initiation of treatment and maintainence of thyroid hormone levels within the normal range significantly reduces the risk of maternal and fetal complications including the outcome of pregnancy.

Considering the magnitude of population ,the high pregnancy rates and increased prevalence of hypothyroidism in pregnancy in our country, where majority of the pregnant women seek antenatal care at the government hospitals, a simple screening test to measure the thyroid function during pregnancy, if made available will significantly reduce the maternal and fetal complications associated with hypothyroidism, as well as hyperthyroidism. Hence universal screening of thyroid function in pregnancy is necessary.

REFERENCES
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