

THYROID DYSFUNCTION IN PREGNANCY - A TERTIARY CARE CENTRE EXPERIENCE

Bajaj S¹, Chawla T¹, Gupta P¹, Chaurasia A¹, Mehrotra R¹

¹Department of Medicine, MLN Medical College, Allahabad.

ABSTRACT

Introduction: Thyroid dysfunction has profound effect on both the mother and the fetus. This study was conducted in order to evaluate the thyroid function in pregnancy and its association with adverse maternal and fetal outcome.

Method: This was a cross sectional epidemiological study. 162 patients were recruited for the study and patients with chronic illnesses were excluded via a detailed history, examination and investigations. Thyroid function tests including anti thyroid peroxidase antibody levels were done to assess the thyroid status. Patients were categorized into subclinical hypothyroidism, overt hypothyroidism or hyperthyroid based on thyroid function test results. Maternal and fetal outcomes were ascertained and the association of outcomes with the thyroid dysfunction was assessed.

Results: 162 pregnant females irrespective of their gestational age were selected for the study. However, fetal and perinatal outcomes could be obtained in 138 cases. Prevalence of thyroid dysfunction among pregnant mothers was found to be 24.07% and subclinical hypothyroidism (18.9%) was the commonest thyroid disorder. There was a clear relationship between thyroid dysfunction and history of abortion, pre-term delivery and stillbirths. Prevalence of low birth weight is significantly higher in mothers with thyroid dysfunction.

Conclusions: Thyroid dysfunction is common during pregnancy and subclinical hypothyroidism is the commonest thyroid disorder. Thyroid dysfunction has a clear association with poor fetal outcome with regards to abortions, pre-term delivery, still births and low birth weight.

Key-words: pregnancy, thyroid dysfunction, adverse pregnancy outcome, autoimmunity

INTRODUCTION

Thyroid dysfunction is a common problem in women of child-bearing age, which has an important implication in pregnancy and the puerperium for both mother and the baby. In the western population, the prevalence of hypothyroidism in pregnancy is around 2.5% (1), the prevalence of Graves' disease is around 0.1–0.4% (2) and that of thyroid autoimmunity (TAI) is around 5–10% (3). Demand for thyroid hormones is increased during pregnancy, which may precipitate or worsen a previously unnoticed thyroid disorder. Pregnancy can increase the size of pre-existing thyroid nodules, trigger formation of new thyroid nodules and possibly increase the risk of developing multinodular goitre later in life (4).

Thyroid dysfunction in pregnancy leads to problems to both the mother and fetus. In pregnant women with hypothyroidism, a threefold increased risk of developing preeclampsia and a twofold increased risk of developing postpartum haemorrhage has been documented (5). Even mild maternal thyroid hormone deficiency may lead to neurodevelopment complications in the fetus as well as beyond pregnancy in the early life of the child (6, 7, 8). Still, the overall lack of evidence precludes

a recommendation for universal screening for thyroid disorder in all pregnant women.

The objective of this study was to clinically evaluate thyroid status in pregnancy and to check the association of thyroid dysfunction to the pregnancy outcome.

METHOD

This study was conducted at M.L.N. Medical College, Allahabad and its associated hospital SRN Hospital, Allahabad during a period from July 2013 to July 2014. All antenatal mothers > 18 years of age attending Obstetrics and Gynaecology OPD or admitted to the Department of Obstetrics and Gynaecology were included in the study.

Detailed clinical history was taken, focusing on the obstetrics and menstrual history. Thorough physical examination was done giving emphasis on clinical evaluation of thyroid and obstetrical examination. Mothers with pre-existing thyroid dysfunction, renal, hepatic or any other chronic illness were excluded from

the study. Haemoglobin level, liver function tests, urea, creatinine, electrolytes, fasting glucose levels, ultrasound scan of abdomen, FT3, FT4, TSH and Anti TPO Ab levels were assessed in all the selected patients.

Patients were followed up until delivery and the pregnancy and fetal outcomes were obtained. Subjects were classified according to their thyroid function test (TFT) results (Table 1). The fetal and pregnancy outcomes were compared between the mothers with thyroid dysfunction to those without thyroid dysfunction using 't' test and Chi-square test.

RESULTS

There were 162 pregnant mothers, irrespective of their gestational age, recruited for the study. Fetal and perinatal outcomes were obtained in 138 patients. 24 patients (14.81%) were lost for follow up.

Prevalence of thyroid dysfunction among pregnant mothers was 24.07%. Hypothyroidism was found to be more common than hyperthyroidism. Amongst the patients with thyroid dysfunction, subclinical hypothyroidism was the commonest thyroid disorder (Figure 1).

History of abortions were significantly higher (33.33%) in mothers with thyroid dysfunction as compared to (15.15%) in mothers without thyroid dysfunction ($\chi^2=4.650$, $p=0.031$) (Table 1). Poor pregnancy outcome in the form of preterm delivery, abortion and stillbirth was more common in mothers with thyroid dysfunction

compared to mothers without thyroid dysfunction ($\chi^2=4.516$, $df=4$, $p=0.03$) (Table 1).

There was a clear association between the prevalence of birth weight among babies who were born with thyroid dysfunction. 28% of the mothers with thyroid dysfunction gave birth to low birth weight baby compared to 9.1% of the mothers with normal thyroid function ($\chi^2 = 4.650$, $df = 1$ and $p = 0.031$) (Table 1).

Table 1: Fetal outcome in mothers with thyroid dysfunction and normal thyroid function

	Mothers with thyroid dysfunction (n=39)	Mothers without thyroid dysfunction (n = 99)
Previous history of abortion	33.3% (n =13)	15.15% (n = 15)
Term delivery	64.1% (n =25)	88.9% (n = 88)
Pre-term delivery	17.9% (n = 7)	6.06% (n = 6)
Abortions & still births	17.9% (n = 7)	5.05% (n = 5)
Low birth weight babies (1.5-2.5kg)	28.0% (n= 7)	9.1% (n=8)

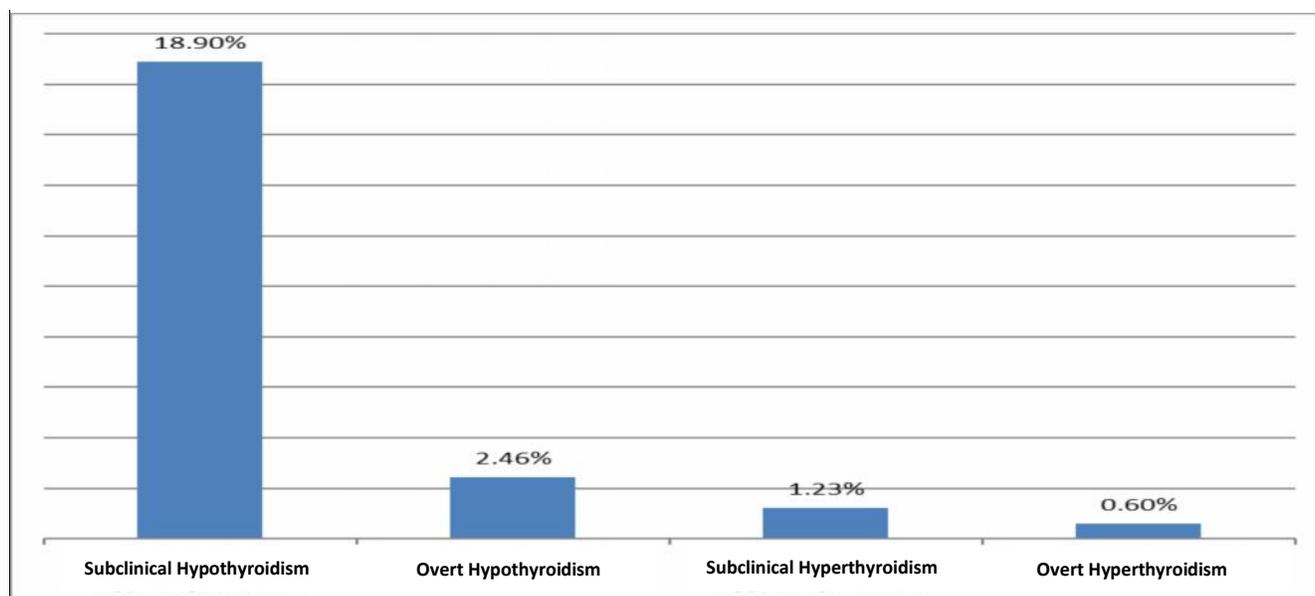


Figure 1: The categories of thyroid dysfunction during pregnancy

Adverse fetal outcome was present in 85.7% of patients with positive autoimmune status ($p < 0.008$) (Table 2). However, we did not find a significant association between pre-eclampsia and postpartum haemorrhage with thyroid dysfunction ($p < 0.907$ and $p < 0.487$ respectively).

Table 2: Thyroid autoimmunity and pregnancy outcome

	Adverse pregnancy outcome (n = 21)	Normal delivery (n = 18)
Mothers with raised TPO antibody levels (n=14)	85.7% (n = 12)	14.2% (n = 2)
Mothers with normal TPO antibody levels (n=25)	9.0% (n = 36)	64.0% (n=16)

DISCUSSION

Thyroid dysfunction is common and subclinical hypothyroidism is the commonest thyroid function disorder during pregnancy. History of abortions are higher and the pregnancy outcome in terms of premature delivery, abortions and still births are also higher in mothers with thyroid dysfunction. Prevalence of low birth weight deliveries is also higher among mothers with thyroid dysfunction. Thyroid autoimmunity has a clear association with adverse fetal outcome, and also with pre-eclampsia and post-partum haemorrhage.

Prevalence of thyroid dysfunction during pregnancy varies from 2.6% to 10% (9-14). However, some studies done in India, Dhanwal et al (15) and Ajmani et al (16) have reported higher prevalence of thyroid dysfunction in pregnancy (14.5% and 12% respectively). The higher prevalence of iodine deficiency could have been the reason for these figures among pregnant mothers in India. However, this study demonstrated even higher prevalence of thyroid dysfunction among pregnant mothers and the higher prevalence of thyroid autoimmunity among this study population could have been the reason for this. Iodine supplementation with universal salt iodization has shown an increase in prevalence of thyroid autoimmunity in most of the populations. This highlights the need for a large multi-centre study to cover the entire country in order to study this problem in this current context.

Thyroid dysfunction has deleterious effect to both the mother and fetus. Increased risk of miscarriage in the mothers with dysfunction is well known (17-22). Association of thyroid dysfunction with pre-term delivery, abortions and still births are also well described (16-23). There are very few studies which have not shown any effect on perinatal outcome and that also only in mothers of subclinical hypothyroidism (24). In this study, we observed a clear association of adverse pregnancy outcome with all the sub-categories of thyroid dysfunction.

Low birth weight is also a well-known adverse fetal outcome that is associated with both hypothyroidism and hyperthyroidism in pregnancy (25-28). Thyroid autoimmunity has also shown a clear association with low birth weight (29, 30). In this study we found that the incidence of low birth weight was increased 3 fold in the subjects with thyroid dysfunction, though the mean birth weight showed no significant difference between the group with thyroid dysfunction and those without. This association is further strengthened by the fact that we excluded the premature births from the data.

Hypertensive disease of pregnancy also shows a correlation with concentrations of TSH and endothelin, in parallel with the severity of hypertension (31). In this study, we failed to find any association of placental abruption and preeclampsia with thyroid dysfunction. This could be because of small sample size of the study.

There is a debate as to whether we should recommend universal screening of pregnant mothers for thyroid dysfunction (32, 33). The American Thyroid Association does not recommend universal thyroid screening during pregnancy and recommend aggressive case finding in specific subsets of subjects (34). However, the recent studies have shown that targeted case finding will miss around 30–50% cases of hypothyroidism and/or TAI (35, 36).

The results of the present study are in consensus with other studies validating the observation that thyroid dysfunction has profound effect on pregnancy as well as fetal outcomes. In addition to this, it also shows higher prevalence of thyroid dysfunction in South East Asian population compared to the western data, suggesting the necessity of recommending universal screening for thyroid dysfunction in pregnancy in order to improve the maternal and fetal outcome of these patients.

The cross sectional design of this study limits ability to assess the causality and was a major limitation of our study. Due to small sample size of the study, generalization of the findings was a problem. This is an area that needs further research to strengthen these findings and also find the reasons and answer to the questions that this study raises.

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