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ORIGINAL RESEARCH

Analysis Of Feto-Maternal Outcome Among Pregnant Hypothyroid Women In Known Population

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ABSTRACT

Background: To analyse outcomes of feto-maternal among pregnant hypothyroid women.

Materials & methods: A total 50 subjects were enrolled. Out of the total, 15 subjects were diagnosed with hypothyroidism. Routine hematological parameters and estimation of T3, T4 and TSH was conducted. Estimation for TSH was conducted using the Enhanced Chemiluminescence method. Fetal outcomes include LBW (neonatal birth weight less than 2.5 kg). The data was analysed using SPSS software. The test was considered significant only when the p value is less than 0.05.

Results: 15 subjects with hypothyroidism were enrolled. Of the women with hypothyroidism, 26.6% had anaemia, and the association between occurrence of hypothyroidism and anaemia was statistically significant (p = 0.009). Preeclampsia was observed in 13.4% of women, and the association between occurrence of hypothyroidism and preeclampsia was statistically significant (p = 0.04).

Conclusion: Anemia, pre-eclampsia, high caesarean rates and neonatal morbidities is significantly associated with hypothyroidism.

Keywords: Low Birth Weight, Pregnancy, Hypothyroidism.

INTRODUCTION

Pregnancy is seen as a risk factor in the occurrence of thyroid disfunctions. In recent years, we can notice a more frequent association between thyroid gland pathology and pregnancy, with a frequency of thyroid pathologies on women that has increased approximately sixfold, according to some statistical data. [1] Moreover, hormonal changes and metabolic needs during pregnancy result in profound alterations of biochemical and clinical parameters which characterize the thyroid gland, changes that express themselves through a state of thyroid hyperstimulation and a relative hypothyroxinemia or a subclinical hypothyroidism, a limiting form between normality and pathology, but nevertheless closer to the pathology during pregnancy.[2,3]

One of the commonest endocrine disorders in women of reproductive age is hypothyroidism, which often presents as an inter-current disease during pregnancy and in the puerperium.

Similar to the non-pregnant state; overt hypothyroidism in pregnancy is also defined as increased serum thyroid stimulating hormone (TSH) and decreased serum free thyroxine (FT4), which ranges in prevalence from 0.3–3% of pregnancies in western world, whereas recent studies from some countries of the Asian subcontinent have reported a higher but variable prevalence of 4.8% to up to 13.13%.[4-7] On the other hand, subclinical hypothyroidism (without typical symptoms of hypothyroidism, increased TSH and normal thyroid hormone levels), has an estimated prevalence of 2–5% of all cases reported in the literature. [8,9]There are several obstetric complications associated with hypothyroidism in pregnancy like gestational hypertension and miscarriages.[10,11] As thyroid hormones have many effects on cardiovascular physiology and blood pressure regulation, there is a higher prevalence of gestational hypertension compared to euthyroid women.[12-14] Moreover, inadequate thyroid hormone levels in the mother have also been associated with low birth weight and fetal death or abortions.[15,16] Hence, this study was conducted to analyse outcomes of feto-maternal among pregnant hypothyroid women.

MATERIALS & METHODS

A total 50 subjects were enrolled. Out of the total, 15 subjects were diagnosed with hypothyroidism. Routine hematological parameters and estimation of T3, T4 and TSH was conducted. Patients with a deranged thyroid profile were subsequently assessed for maternal and fetal complications. Infertility, family history of thyroid disorder, menstrual history, recurrent abortions, mean T3, T4, TSH levels, haemoglobin levels, maternal and fetal outcome were the main study variables. Estimation for TSH was conducted using the Enhanced Chemiluminescence method. Estimation of free T3 and free T4 was subsequently carried out when TSH levels were abnormal. Fetal outcomes include LBW (neonatal birth weight less than 2.5 kg). The data was analysed using SPSS software. The test was considered significant only when the p value is less than 0.05.

RESULTS

15 subjects with hypothyroidism were enrolled. Of the women with hypothyroidism, 26.6% had anaemia, and the association between occurrence of hypothyroidism and anaemia was statistically significant ($p = 0.009$). Preeclampsia was observed in 13.4% of women, and the association between occurrence of hypothyroidism and preeclampsia was statistically significant ($p = 0.04$). Cesarean delivery occurred in 26.6% of women with hypothyroidism having significant association ($p = 0.02$) and oligohydramnios ($p = 0.08$). Preterm delivery occurred in 6.7% of hypothyroidism and was not significantly associated with hypothyroidism. 40% had LBW babies, and the association between LBW and hypothyroidism was significant ($p = 0.001$). NICU admission 46.7% was significantly associated with hypothyroidism ($p = 0.001$).

Table 1: Association of maternal and fetal risk factors in women with hypothyroidism (n= 15)

Outcome %	95% CI	p value
Anaemia 26.6%	1.5-14.8	0.009
Preeclampsia 13.4%	1.0-18.12	0.04
Preterm 6.7%	0.3-23.05	0.5
Oligohydramnios 6.7%	0.03-1.2	0.08
Caesarean section 26.6%	1.4-16.3	0.02
Low birth weight 40% (LBW)	2.1-20.54	0.001
NICU admission 46.7%	0.05-0.48	0.001

DISCUSSION

The profound physiological changes of pregnancy significantly affect the interpretation of thyroid function. Consequently, thyroid function test results of healthy pregnant women differ from those of healthy non pregnant women. As such, the criteria for diagnosing hypothyroidism on the basis of S TSH during pregnancy have been changing. Although S TSH values of 4.0-6.0 mIU/L were considered normal in the past, recent opinions suggest that first trimester values >2.5 mIU/L and second and third trimester values >3mIU/L are associated with adverse fetomaternal outcome. [17,18] Hence, this study was conducted to analyse outcomes of feto-maternal among pregnant hypothyroid women.

In the present study, 15 subjects with hypothyroidism were enrolled. Of the women with hypothyroidism, 26.6% had anaemia, and the association between occurrence of hypothyroidism and anaemia was statistically significant ($p = 0.009$). Preeclampsia was observed in 13.4% of women, and the association between occurrence of hypothyroidism and preeclampsia was statistically significant ($p = 0.04$). A study by Kiran Z et al, studied a cross-sectional retrospective study on 718 cases in the Aga Khan University Hospital after ethical approval. They collected information on pregnant females who have diagnosed hypothyroidism before conception or during their antenatal period. They recorded maternal outcomes as pregnancy loss (including miscarriage, stillbirth/intrauterine death, medical termination of pregnancy and ectopic pregnancy), gestational hypertension, pre-eclampsia, postpartum hemorrhage, placental abruption, and modalities of delivery. Among 708 hypothyroid women 638 had live births. Postpartum hemorrhage was the most frequent maternal outcome (38.8%). The emergency cesarean section occurred in 23.4% of cases. They determined TSH levels in 53.2, 56.7, 61.7 and 66.6% of cases in preconception, 1st, 2nd, and 3rd trimester periods. A significant association existed between cesarean section and preconception thyrotropin levels > 2.5 mIU/L, whereas postpartum hemorrhage was significantly associated with thyrotropin levels > 2.5 mIU/L in the preconception and third trimester.[19]

In the present study, cesarean delivery occurred in 26.6% of women with hypothyroidism having significant association ($p = 0.02$) and oligohydramnios ($p = 0.08$). Preterm delivery occurred in 6.7% of hypothyroidism and was not significantly associated with hypothyroidism. 40% had LBW babies, and the association between LBW and hypothyroidism was significant ($p = 0.001$). NICU admission 46.7% was significantly associated with hypothyroidism ($p = 0.001$). Another study by Mahadik K et al, studied prospective observational study was carried out at R.D. Gardi Medical College, Ujjain, India. Subjects of the study were 198 antenatal women in third trimester with singleton pregnancy admitted in the obstetric ward, and informed consent was obtained. Routine hematological parameters and estimation of T3, T4 and TSH was conducted. Patients with deranged thyroid profile were subsequently assessed for maternal and fetal complications. History of infertility, family history of thyroid disease, menstrual pattern, recurrent abortion, hemoglobin level and fetal outcome were the main study variables. Prevalence of thyroid disorder is 11%; with subclinical hypothyroidism, overt hypothyroidism and subclinical hyperthyroidism occurring in 5.6, 3.5 and 1.5% of subjects respectively. In women with subclinical and overt hypothyroidism, anemia was present in 26.3% being significantly associated with hypothyroidism ($p = 0.008$). With respect to fetal outcome, LBW 31.6% ($p = 0.001$), NICU admission 42.1%, ($p = 0.000$) and low APGAR Score (21.1%, $p = 0.042$) were statistically associated with hypothyroidism. Risk of anemia, Low Birth weight, NICU admissions, and low APGAR score was 4.8, 6.3, 0.14 and 3.64 times higher respectively in women with hypothyroidism than in women who are euthyroid. [20] Studies from countries like USA, China and Switzerland have established trimester specific reference ranges for S TSH during pregnancy which were found to be lower than their non-pregnant counterparts.[21,22] In India,

the trimester specific S. TSH reference ranges have been reported by Kumar et al., and Marwaha et al., and are shown to be higher than that of reports from Western literature.[23,24] In the study by Kumar et al., it was suggested that due to reduced availability of Iodine the S TSH during pregnancy in Indian women is high and significantly overlaps with that of non-pregnant state.[24]

CONCLUSION

Anemia, pre-eclampsia, high caesarean rates and neonatal morbidities is significantly associated with hypothyroidism.

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