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STUDY OF MATERNAL AND FETAL OUTCOME IN PREGNANT WOMEN WITH THYROID DISORDERS.

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ABSTRACT:

Introduction: Thyroid dysfunction in pregnancy is one of the most prominent endocrinological disorders after diabetes mellitus. Physiological changes in thyroid status and non-adaptation to these changes during pregnancy leads to imbalance in thyroid hormones.

Aim & Objective: To study the maternal and foetal outcome.

To reduce maternal and fetal complications by evaluating TSH,T3,T4.

Materials and Methods: A Prospective Study conducted on pregnant women with thyroid dysfunction. Data of maternal and fetal out come collected.

Results:100 pregnant women with thyroid dysfunction during the study.95 had high TSH and 5 low TSH. Mean maternal age was 25.89 years. 43% Primi gravida and 57 % multigravida.64% of hypothyroid pregnant women are overweight and obese.52% had previous history of thyroid dysfunction. The mean gestational age of delivery was 37.5 weeks, spontaneous vaginal birth 46%, assisted vaginal delivery 2% ,LSCS 52% Outcome of pregnancy in thyroid dysfunction was pre-eclampsia 20% abruptio placenta 6% gestational diabetes mellitus 6% abortion 3% oligohydramnios 13% IUGR 23.8% preterm delivery 47%. Foetal outcome low birthweight 37%, foetal distress 31.7%, NICU admissions 12.9%, stillbirth 5%, and neonatal death 5.9%.

Conclusion: Universal screening for thyroid disorders is recommended for all women in the pre-conception period or in early pregnancy. Early diagnosis and treatment with regular followup to ensure favourable maternal and foetal outcomes.

Keywords: Thyroid Dysfunction, Pregnancy, Maternal, Outcome.

INTRODUCTION

Thyroid dysfunction in pregnancy is one of the most prominent endocrinological disorders after diabetes mellitus. Physiological changes in thyroid status and non-adaptation to these changes during pregnancy leads to imbalance in thyroid hormones which in turn impacts fertility, maternal health and foetal growth and development.

Assessment of thyroid function is important during pregnancy because of its proven influence on feto-maternal outcomes. During pregnancy, physiology of thyroid starts altering, which continues throughout the gestation, and is reversible postpartum. Factors responsible for alteration of thyroid status include increased thyroxine-binding globulin (TBG), altered peripheral metabolism of thyroid hormones, increased renal loss of iodine, and change in iodine transfer to the placenta. These changes help the maternal thyroid gland to alleviate the increased physiological demands.

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There is wide geographical variation in the prevalence of thyroid disorders in pregnant women. In India, as per existing literature, the prevalence of overt and subclinical hypothyroidism in pregnancy is reported between 3 to 4.58% and 6.47–9%, respectively , Overt and subclinical hyperthyroidism reported around 0.4–1.7% and 0.4–0.7% of pregnancies, respectively.

Several studies have reported that thyroid dysfunction -both overt and subclinical is associated with increased risk of abortions, anaemia , preeclampsia, placental abruption, placental abnormalities, intrauterine growth restriction (IUGR), stillbirths, preterm delivery, postpartum hemorrhage, congestive heart failure and even myopathy. Reduced intellectual function in the offspring, congenital anomalies, and cretinism are most commonly seen in the babies of women, where iodine deficiency is the cause of hypothyroidism.

So, thyroid disorders during pregnancy predispose to increased feto-maternal and neonatal morbidity and mortality hence it is important to identify women at risk by early screening and initiation of timely treatment. In this context, with relatively insufficient data regarding the prevalence of thyroid disorders and their effect on feto-maternal outcomes in Low and Middle-income countries like India we undertook this study to determine the prevalence of thyroid disorders in pregnancy in a tertiary care facility in Government general hospital, Anantapuramu. The secondary objectives of the study were to reduce miscarriages, preeclampsia, abruption and premature birth in pregnant women with thyroid dysfunction and to prevent neonatal complications like IUGR, low birth weights, neonatal hypothyroidism ,NICU admissions.

AIM AND OBJECTIVES:

To study the maternal and foetal outcome in pregnant women with thyroid dysfunction.

To reduce maternal and fetal complications by evaluating TSH ,T3,T4.

MATERIALS AND METHODS:

A Prospective observational Study was conducted during on pregnant women with thyroid dysfunction who are admitted in wards at Government General Hospital Anantapuramu. Data regarding maternal and foetal outcomes in pregnant women with thyroid dysfunction was retrieved.

Study design : A Prospective observational Study

Duration of the study : 12months July 2022 – July 2023

Sample size. : 100

Place of study : GOVERNMENT MEDICAL COLLEGE, ANANTHAPURAMU

Study Population :100 subjects

Subject Criteria :

All pregnant women who were booked for antenatal care at the hospital during the study period with abnormal thyroid profile.

Exclusion Criteria. :

1. Women with past h/o significant elevated BP diagnosed prior to pregnancy ,pre-gestational Diabetes.
2. Patients who were lost for follow-up.

Details of Study

100 pregnant women with abnormal thyroid status attending antenatal OP were included in the study and detailed history regarding thyroid status was obtained. A sample of blood drawn for

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TSH and estimated by sensitive chemiluminescent method. Abnormal TSH values were defined as mentioned

The normal cutoff value for TSH was defined as 0.1-2.5mIU/mL.

Lower limit range for diagnosis of hyperactivity of Thyroid:0.1mIU/mL.

Upper limit range for diagnosis of hypoactivity of thyroid :2.5mIU/ml .

Abnormal values were further followed up with freeT4 and freeT3 till term to note the maternal and fetal outcome.

Sample collection:

The blood sample is taken for the test along with the other routine antenatal blood investigations.

Pregnant women with abnormal TSH were further divided into those with

TSH>2.5mlU/mL (suggestive of hypothyroidism) and those with TSH<0.1mIU/m L (suggestive of hyperthyroidism)

Statistical analysis:

It was done by using Chi-square test.

A ’p’ value lessthan 0.05 was considered statistically significant.

The following parameters determined:

Mean Maternal Age

Parity

Previous history of thyroid disorders

Body Mass Index

Incidence of Preeclampsia

Incidence of Gestational Diabetes(GDM)

Incidence of Abruption

Incidence of Intrauterine growth restriction(IUGR)

Mean Gestational Age at delivery

Mode of delivery

Mean Birth Weight

Low Birth Weight

Stillbirths

Neonatal deaths

Fetal distress

OBSERVATION & RESULTS

This is a prospective observational study of 100 pregnant women with thyroid dysfunction who attended the antenatal clinic at the Government Medical College and Hospital in Ananthapuram for one year with prior informed consent.

TSH levels were high in 95 of the 100 women (indicating hypothyroidism)

and reduced in five (hyperthyroidism).

The major goal of this study was to investigate the maternal and foetal outcomes in pregnant women with thyroid dysfunction.

The Chi-square test was used for statistical analysis.

A 'p' value of less than 0.05 was deemed statistically significant.

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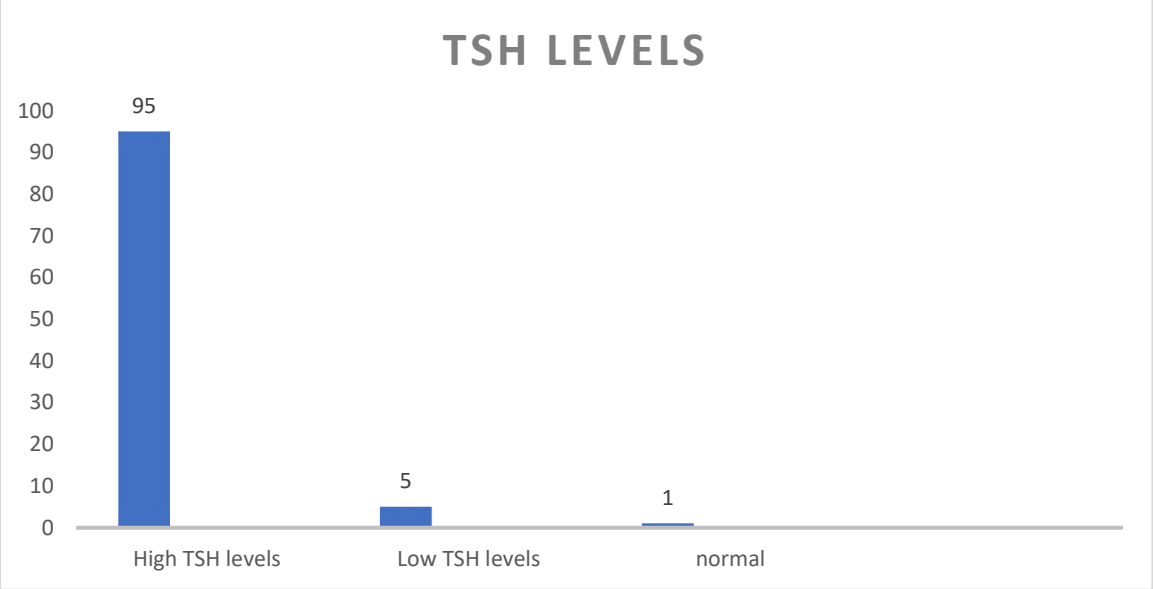
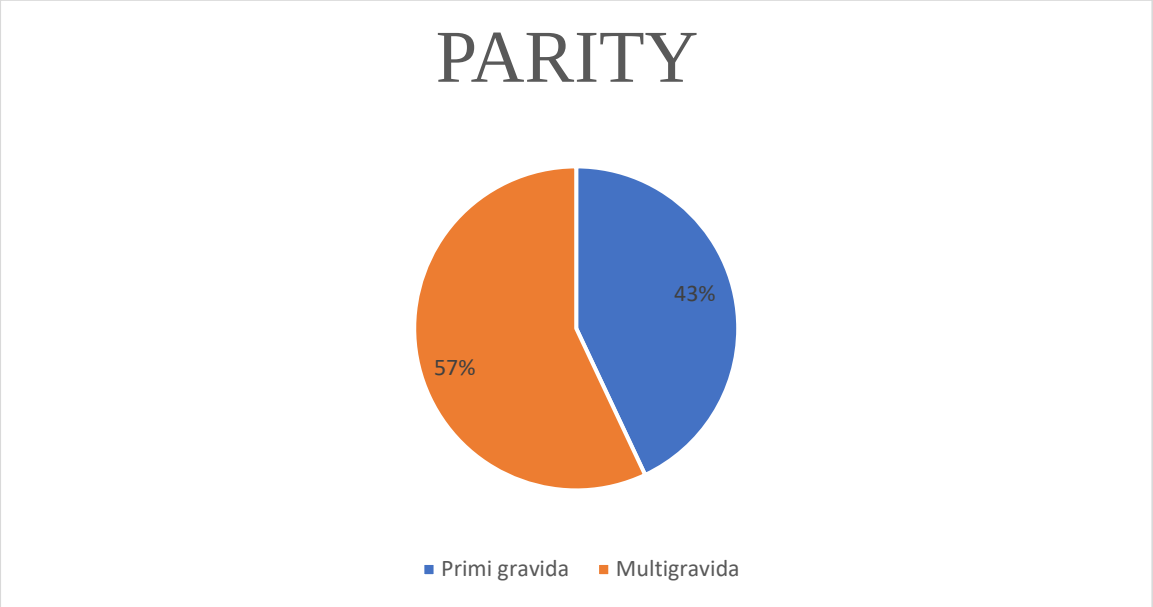
100 pregnant women with thyroid dysfunction during the study.95 had high TSH and 5 low TSH. Mean maternal age was 25.89 years. 43% Primi gravida and 57 % multigravida.64% of hypothyroid pregnant women are overweight and obese.52% had previous history of thyroid dysfunction. The mean gestational age of delivery was 37.5 weeks, spontaneous vaginal birth 46%, assisted vaginal delivery 2% ,LSCS 52% Outcome of pregnancy in thyroid dysfunction was pre-eclampsia 20% abruptio placenta 6% gestational diabetes mellitus 6% abortion 3% oligohydramnios 13% IUGR 23.8% preterm delivery 47%. Foetal outcome low birthweight 37%, foetal distress 31.7%, NICU admissions 12.9%, stillbirth 5%, and neonatal death 5.9%.





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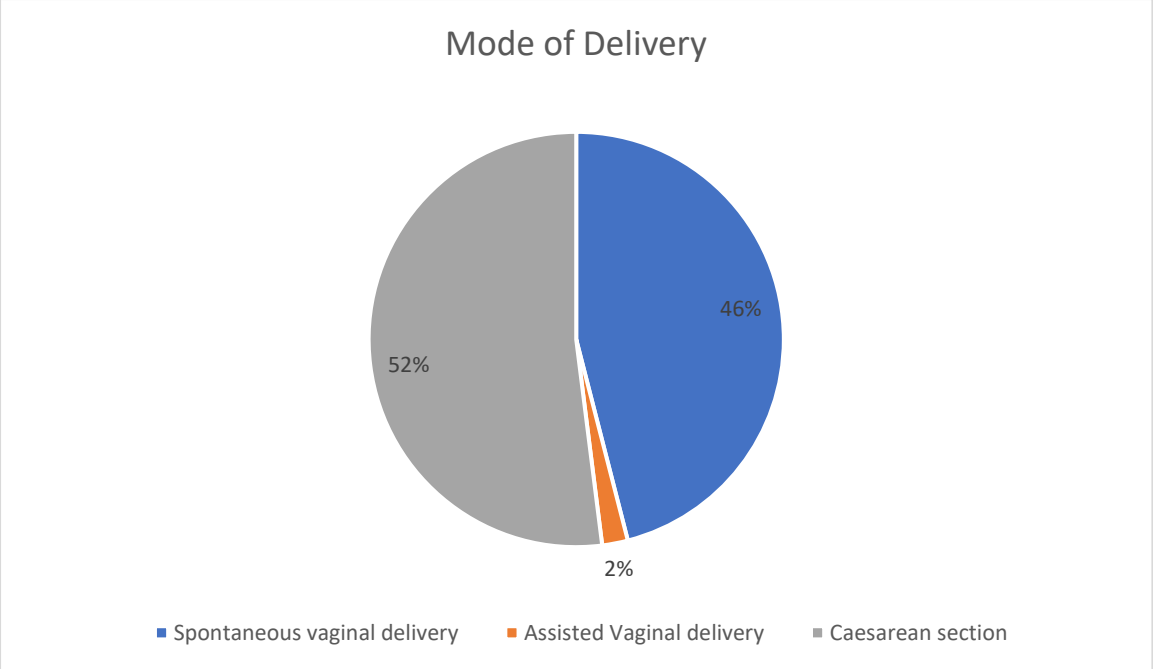

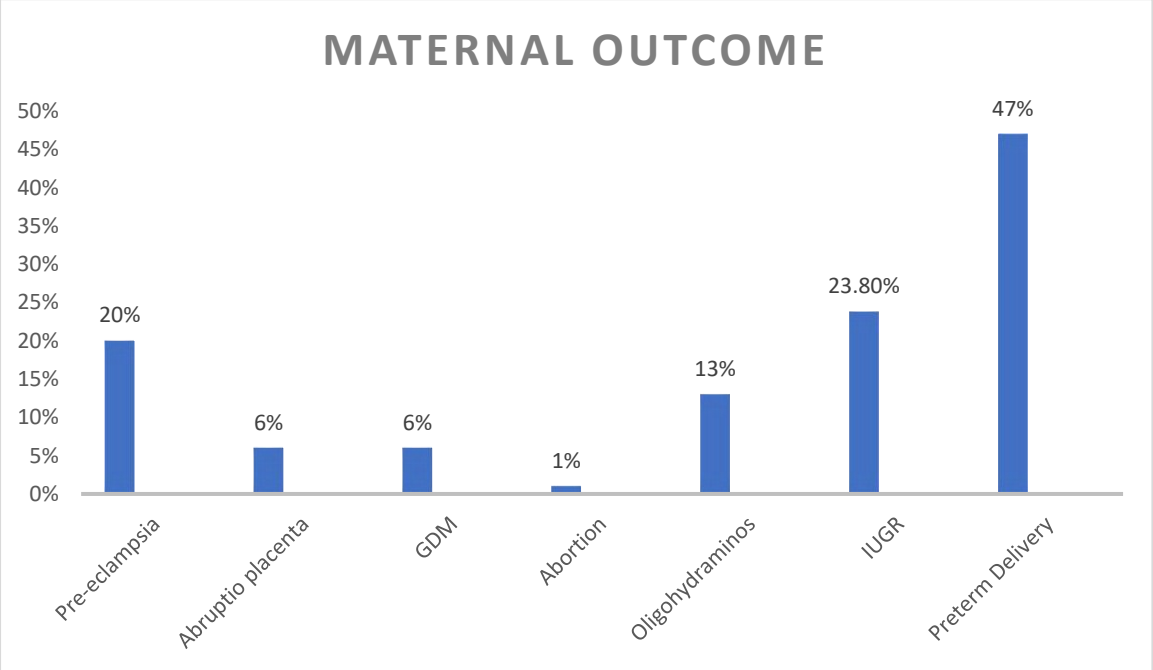

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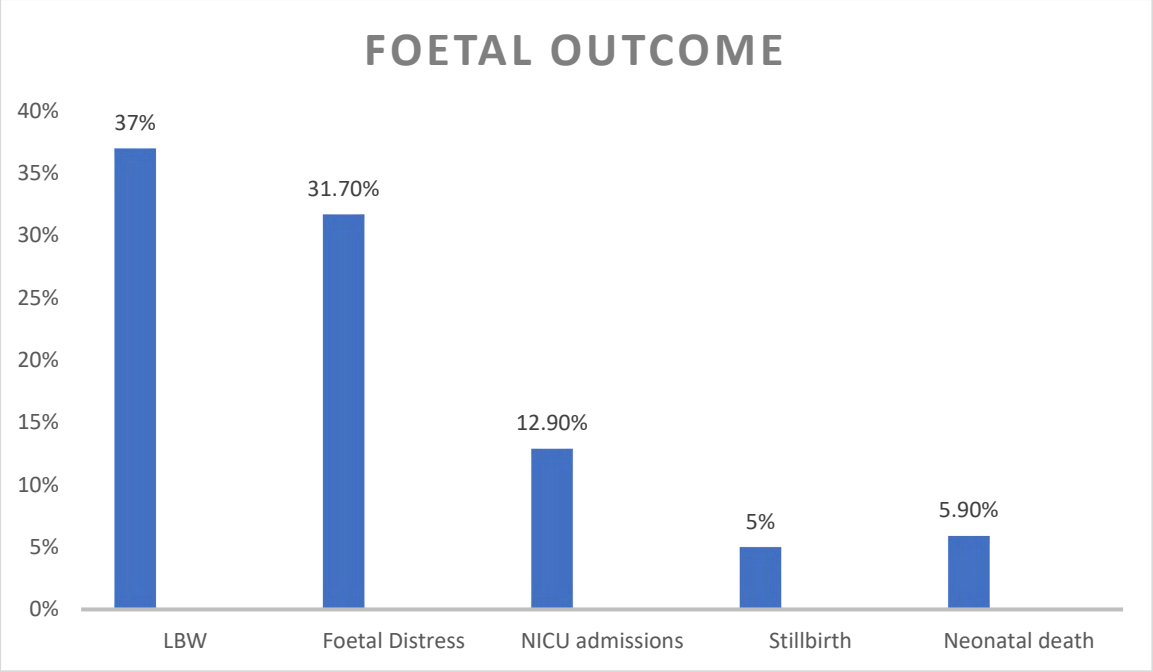

DISCUSSION

A healthy thyroid gland is instrumental in coping with the increased physiological demands during pregnancy and maintains adequate thyroid functioning. Any alteration in the maternal thyroid hormone levels consequently affects the feto-maternal outcomes.

MATERNAL AGE :

The mean maternal age is 25.89years.

Most of the women are between the age group 21 to 25 years followed by 26 to 30 years of age.

PARITY:

Around 43 % were Primigravida and 57 % were Multigravida in this study. The parity showed a high incidence of multigravida especially in hypothyroidism.

BMI:

About 64% of hypothyroid pregnant women were overweight and obese which indicates incidence of hypothyroidism is more in obese and overweight women.

PREVIOUS HISTORY OF THYROID DISORDERS:

52 % had previous history of thyroid dysfunction in this study with a p value of 0.345.

GESTATIONAL AGE AT DELIVERY:

The average gestational age at birth is 37.5 weeks in this study.

About 47% of the deliveries were preterm (<37 weeks).

MATERNAL AND FOETAL OUTCOME:

In this study, there was a rise in the incidence of pre-eclampsia (20%), abruptio placenta (6%), gestational diabetes mellitus (6%), abortion (3%), oligohydramnios (13%), IUGR (23.8%), preterm delivery (47%), low birthweight (37qqq%), foetal distress (31.7%), NICU admissions (12.9%), stillbirth (5%), and neonatal death (5.9%).

PRE ECLAMPSIA:

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Chronic endothelial cell damage, which is mediated in part by abnormal thyroid hormone levels can have long-term cardiovascular consequences. Preeclampsia, in this sense is regarded as a sickness with Endothelial cell activation resulting in multi-organ involvement. Therefore, it makes sense to hypothesise that aberrant thyroid hormone levels contribute independently or jointly to the onset of preeclampsia in women with a hereditary predisposition to the condition. By increasing the amount of beta adrenoceptors and acting in the reverse way on alpha adrenergic receptors, thyroid hormones amplify the beta adrenergic response. Beta adrenoceptor density on vascular beds decreases whereas alpha-1 adrenoceptor density rises in the hypothyroid state. Alpha adrenoceptor activation mostly includes smooth muscle cell contraction, which narrows the blood vessel.

In our study the incidence of preeclampsia is 20 % with p value of 0.001 whis is statistically significant.It is related to a research conducted by Ozdemir H et al(14.5%).

In a research by Wilsonetal21 on pregnancy outcomes in 24,883 women, the total incidences of hypertension in pregnancy were 6.2%, 8.5%, and 10.9% in the subclinical hyperthyroid, euthyroid, and subclinical hypothyroid groups, correspondingly.

PLACENTAL ABRUPTION AND PRETERM DELIVERY:

There is evidence that preterm birth, vascular illnesses like preeclampsia, and placental abruption may be caused by defective early placentation, which is one unifying hypothesis. Thyroid hormone is also important for optimal placental development. Both thrombosis and haemorrhage can occur at the uteroplacental interface, especially when there is physically deficient placenta. Such pathogenesis may be mediated by a number of causes, such as tissue factor synthesis in response to abnormal VEGF and the release of inflammatory cytokines that encourage thrombosis. Additionally, shallow extravillous thromboblast invasion (EVT) can result in placental hypoxia and haemorrhage, which can locally produce thrombin and cause the extracellular matrix to degrade prematurely, separating the placenta from the uterus. In our study the incidence of abruption is 6% with a p value <0.001 which is statistically significant. The incidence of preterm delivery is 47%. 66

Caseyetal12 discovered that women with subclinical hypothyroidism had three-fold greater risk to have placental abruption and two times more likely to have premature birth in a study of 25,756 pregnant women.

GESTATIONAL DIABETES

Diabetes patients frequently have thyroid antibodies, which suggests that thyroid dysfunction and insulin resistance may both be risk factors for the disease.

According to Tudela CMetal's study30, the anticipated percent of gestational diabetes increased from 1.9% to 4.9% when thyrotropin levels went from 0.001 to 10 milliunits/L (P=.001), indicating that thyrotropin level impacts the chance of developing gestational diabetes.

The current study found a 6% incidence of GDM with a P value greater than 0.05, while Pavanaganga et al found a 6.4% incidence.

ABORTIONS:

The abortion rate in the current research is 3%, which is consistent with Tanuja PM, et al (1.7%). Antibodies to thyroid peroxiadase (TPO-AB) or thyroglobulin has been associated to a significant increase in pregnancy loss.

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OLIGOHYDRAMINOS:

In present study incidence oligohydramnios is 13% with a P value <0.001 which is statistically significant and in a study done by Pavanaganga et al, it is 8.35.

LOW BIRTH WEIGHT

The growth and development of the fetus depends on thyroid hormone. Research by Leungetal19 Compared to 6.8% of controls, 22% of mothers with hypothyroidism had low birthweight. In our study, 37% of babies with low birthweights (less than 2.5 kg) were born.

FETAL DISTRESS

The likelihood of fetal distress during labour has been increased due to hypothyroidism, which has been suggested to have an irreversible effect on the fetus and placenta early in pregnancy. Fetal distress is frequent in hypothyroid pregnancies. In a study by Poonametal31, pregnant hypothyroid women had a 20% prevalence of perinatal distress compared to a 6% prevalence in the healthy group.Incidence of fetal distress is 32% with a P valuen<0.001 which is statistically significant.

ROLE OF SCREENING FOR THYROID DISORDERS IN PREGNANCY

Unlike in western world the incidence of hypothyroidism is higher in India. Various studies in India Sahuetal16,Vimal Nambiaretal17 confirm the higher incidence of hypothyroidism in India. Further there was no increase in adverse pregnancy outcomes in adequately treated hypothyroidism where as 63 untreated/inadequately treated hypothyroidism was associated with statistically significant increase in adverse pregnancy outcomes .Studies by BijayVaidya, Dr.Lazarus6 andNegroetal29 further eiterate the point.The consensus panel formed by Gharib28 and associates in 2005 also goes in agreement with The American Association of Clinical Endocrinologists that thyroid screening in pregnancy should be done.

CONCLUSION

In conclusion, maternal thyroid disorders significantly impacts the maternal and fetal outcomes if adequate treatment is not initiated in the early gestational period. Early diagnosis, prompt treatment, proper follow-up, education of clinicians and patients will immensely help us to reduce maternal and neonatal morbidity and mortality.

Early prenatal screening for thyroid dysfunction should really be made mandatory. All obstetricians, endocrinologists, doctors, and lab technician should be made aware of the distinct pregnancy-specific and trimester-specific thyroid hormone ranges. From the first prenatal checkup onward, all patients should have a TSH of 2.5 mIU/ml or below. A collaborative effort by all medical experts engaged will result in improved maternal and newborn health. More importantly, it will contribute to raising the IQ of India's and the world's unborn generations.

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