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STUDY OF ASSOCIATION OF THYROID HORMONE IN PRE-ECLAMPSIA AND NORMAL PREGNANCY

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Abstract:

Objective: *The objective of the study was to evaluate the association of thyroid hormone in preeclampsia and normal pregnancy.*

Material and method: *This was a clinical case control study in the hospital. A total of 100 women were included, including 50 normal pregnant women in the control group and 50 preeclamptic women if they were included.*

Result: *No significant differences were found in FT3 (p value 0.085) and FT4 (p value 0.065) in the control and case group in this study. The levels of TSH and Anti TPO in the control and case group were statistically significant (p-value <0.001 and <0.000).*

Conclusion: *we have observed that thyroid hormones (TSH and Anti TPO) have a statistically significant relationship in pre-eclatic women.*

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INTRODUCTION:

Preeclampsia is the leading cause of maternal mortality.In developing countries and is associated with a five-fold increase in perinatal mortality.1 The National High Blood Pressure Education Program working group defines preeclampsia as if blood pressure after 20 weeks of gestation had increased at 140/90 mm Hg or more or have an average BP (diastolic + 1/3 of the pulse pressure) greater than 110 mm Hg. The increase in B.P. they must be present on at least two occasions after 6 hours together with the presence of proteinuria and / or edema 2. Pregnancy is associated with many hormonal changes that include increased estrogen, human chorionic gonadotropin, human chorionic somatotropin, prolactin and decreased thyroxine.3 It has long been known that excess or deficiency of maternal thyroid hormone can affect mother and fetal outcome at all stages of pregnancy and may interfere with ovulation and fertility.

The mechanism and clinical importance of hypothyroidism in preeclampsia are controversial and may be related to the decrease in plasma protein concentrations and the increase in the level of endothelin. 5 Due to several changes in the thyroid profile of patients with preeclampsia and in normal pregnancy, we tried to study the comparison of serum levels of FT3, FT4, TSH and Anti TPO in preeclampsia and normal pregnancy.

MATERIAL AND METHODS:

After obtaining informed consent and authorization from the institutional ethics committee, 100 women were included for study. This is an observational study based on a hospital with a case control design. It was performed in 50 normal pregnant women and 50 preeclamptic women who entered the department of obstetrics and gynecology of Mayo Hospital Lahore.

Inclusion criteria for women

1. Patients with preeclampsia in the third trimester of pregnancy.
2. All cases of preeclampsia diagnosed consecutively.
3. No history of thyroid disease in pregnancy and postpartum.
4. No history of a malformed congenital child.

The same number of healthy normotensive pregnant women matched in the third trimester who attended the prenatal clinic during the study period, labeled as a control group. If at any time during the prenatal period, the follow-up control group developed hypertension, they were excluded from the group.

Exclusion criteria for women

1. Patients with a history of any metabolic disorder before or during pregnancy.
2. Known case of thyroid disorder.
3. History of kidney disease.

Blood pressure was recorded in the semi-reclined position of the right arm on 2 occasions 6 hours apart. Blood pressure more than 140/90 mm Hg on two or more occasions at least 6 hours apart and proteinuria (which was diagnosed at least by 1+ by uristix) were considered preeclamptic women. After hospitalization, 10 ml. of venous samples were obtained for the control of the antihypertensive control and before birth with all aseptic measures. The serum was used for the analysis of thyroid hormone (FT3, FT4 and TSH) and Anti TPO in the laboratory using the chemiluminescent assay with the fully automated 2000 immunolytic machine.

Table 1: Comparison in thyroid hormone in case and control group

	Case Mean ± SD	Control Mean ± SD	p value
Age	25.60 ± 4.36	24.40 ± 3.30	0.124 BP
Systolic	149.52 ± 6.66	121.36 ± 3.14	<0.001
Diastolic	94.48 ± 3.95	80.16 ± 1.56	<0.001
FT3	2.24 ± 0.82	1.99 ±0.085	0.60
FT4	1.13 ± 0.45	1.00 ±0.065	0.20
TSH	5.36 ± 2.66	3.48 ±	<0.00 1.831
Anti-TPO	46.12 ± 14.56	22.66 ± 17.39	<0.001

All patients were followed during the prenatal, intrapartum and postpartum periods. They have been observed in particular for the development of symptoms and signs of hypo and hyperthyroidism. The normal values used in our study are

Serum FT3 = 1.8-4.2 pg / ml

Serum FT4 = 0.89-1.76 ng / ml Serum TSH = 0.4-4.0 µIU / ml
Serum anti-TPO = up to -35 IU / ml P value less than 0. 05 was considered significant

OBSERVATION AND RESULTS:

A total of 100 women were enrolled, including 50 normal pregnant women in the control group and 50 pre-eclatic women in the case group. The average age of the cases was 25.60 ± 4.36 years and the average control age was 24.40 ± 3.30 years (p value = 0.124). Thyroid function tests were the main study variables and our study shows that the mean triiodothyronine (FT3) in the case was 2.24 ± 0.82 pg / ml and in the control it was 1.99 ± 0.60 pg / ml (p = 0.085). The mean free thyroxine (FT4) in the cases was 1.13 ± 0.45 ng / dl and in the control it was 1.0 ± 0.20 ng / dl (variable value = 0.06 5). The stimulating hormone (TSH) was 5.36 ± 2.66 µU / ml and in the control 3.48 ± 1.83 µU / ml (p value <0.001). On average cases of antithyroid peroxidase (anti-TPO) it was 46.12 ± 14.56 IU / ml and in control it was 22.66 ± 17.39 IU / ml (p value <0.001). There were no significant differences in FT3 (p 0.085) and FT4 (p 0.065) in the control and case group. The levels of TSH and Anti TPO in the control and case group increased significantly (p <0.001 and <0.000) (Table 1) and (Figures 1 and 2).

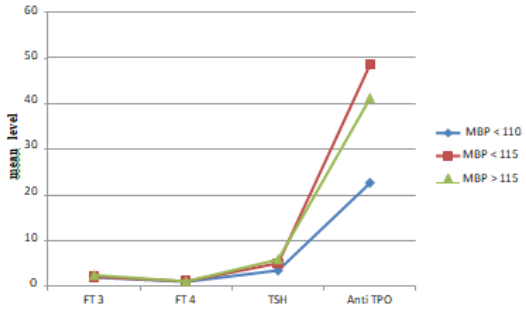

Fig. 1: Thyroid hormone in normal and preeclamptic women with 3 level of mean BP

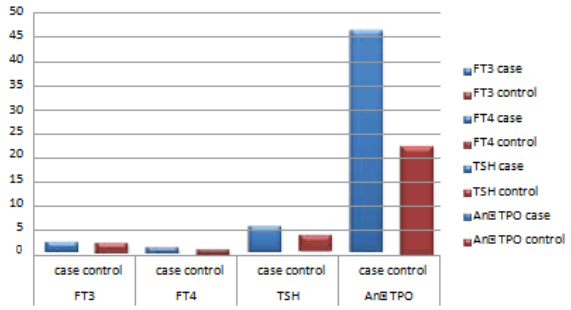

Fig. 2: Comparison in thyroid hormone in case and control group

DISCUSSION:

This is the leading cause of maternal and fetal / neonatal mortality and morbidity worldwide. The purpose of the study is to determine thyroid dysfunction in pre-eclatic women in the tertiary care center. The study was conducted on 100 pregnant women (50 pregnant women as a control) who sent in a tertiary care hospital in Lahore. Pregnant women had no comorbid disease. Several studies have attempted to determine the relationship between unbalanced thyroid function and preeclampsia. In the present study group we observe that there is a high prevalence of hypothyroidism of approximately 46% in preeclamptic women compared to 14% in the control. These results supported the report that preeclamptic women had a higher incidence of biochemical hypothyroidism than normotensive pregnant women (Kumar et al. 2005 40% v / s 12.2%). 5

We observed that the level of serum TSH was significantly higher in the study group than in the controls (mean TSH 5.36 ± 2.66 µU / ml P <0.001). These results are in agreement with Kumar et al, Lao et al, 6 Tehrani et al, 7 Larijani et al.8 On the other hand, Khadim et al, 9 Qublan et al 10 observed an insignificant TSH value. High estrogen levels lead to an increase in TBG levels in pregnancy. This may explain the high levels of TT3 and TT4 observed in some studies. However, the levels of FT3 and FT4 remain normal. In preeclampsia, the conversion of T4 to T3 in the liver has the hypothesis, which may explain the low levels of FT3 observed in preeclamptic patients. In addition, it is believed that preeclampsia causes a diseased euthyroid state that leads to low levels of FT3 in the presence of normal levels of FT4 and TSH.

CONCLUSION:

Thyroid diseases are predisposing factors for the development of preeclampsia. We observed a statistically significant number of preeclamptic women with abnormally high levels of TSH and levels of Anti TPO. A greater statistically significant number of cases with preeclampsia (46%) were also observed in pregnant women compared to (14%) in the control group. TSH is above 5 µIu / ml, so the risk of developing preeclampsia is 4-5 times higher. This high risk is a potent marker for the development of preeclampsia that needs more research due to the

limited number of subjects in this study. A multicenter study can reveal the association and mechanism of thyroid abnormalities in preeclamptic women in different geographic regions.This study helps us identify thyroid abnormalities and take appropriate therapeutic actions to correct them. It can reduce the incidence and severity of morbidity and mortality associated with preeclampsia.

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