

Evaluation of patients with preeclampsia Some Biochemical Parameters and Hormones in Iraqi women

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ABSTRACT:

Pre-eclampsia (PE) is a metabolic disease that has a negative impact on both pregnant women and their infants. This study included 60 samples from patients who attended the Obstetrics and Gynecology/Baghdad Teaching Hospital-Medical City, divided into two groups 30 normal pregnant women as a control and 30 patients with ages ranged from 20 to 40 years. The findings revealed a statistically significant decrease in the hormones TT4, TT3, FT4 and FT3 as well as phosphorus excretion, but no changes in calcium or TSH, and a statistically significant increase in S. creatinine, and uric acid when comparing preeclampsia to a control group. Student t-test was employed as a statistical tool to verify the findings.

Keywords: Preeclampsia, Thyroid Hormones, Calcium, Urinary phosphate, Renal tests.

INTRODUCTION:

Pre-eclampsia (PE) is a multisystem illness that only occurs in pregnant women and has no recognized cause, the reported rate fluctuates between 6% and 7%. PE affects the function from several organs in the body, including the thyroid gland, and is more common in primigravidas and 3% to 4% in multiparous patients (1). Thyroid hormones naturally raise by 40–100% during pregnancy to suit the needs from both the mother and the fetus, however, incompatibility with these changes causes the thyroid gland to become dysfunctional (2). Thyroid Stimulating Hormone (TSH) rises in a healthy pregnancy as a result of an increase in Human Chorionic Gonadotropin (HCG) (Geno et al.,2022). The metabolic by product of purine nitrogenous base is uric acid, is used to diagnose illnesses, forecast their severity and complications, the assessment of harmful maternal and fetal outcomes of pregnancy hypertension diseases will be done by measuring the mother's serum uric acid level (3). The amino acids methionine, glycine, and arginine

are used to make creatine, and creatinine is the metabolic byproduct of this process, In a healthy pregnancy, an increase in fluid volume causes the s. creatinine concentration to fall, but in PE, endothelial cell injury brought on by a decline in vascular endothelial growth (VEGF) agents may cause the concentration of maternal blood creatinine to rise (4, 5).

MATERIAL AND METHODS:

A total of 60 samples, divided into two groups of 30 normal pregnant women as a control and 30 patients, were obtained from the Obstetrics and Gynecology Department of the Baghdad Teaching Hospital in Medical City between March to the end of October 2022. Five milliliters of the patients' blood were taken. After that, serum was separated and used to assess further biochemical tests, TSH, TT4, FT4, TT3, and FT3 hormones were evaluated utilizing the Cobas e 411 analyzer - Roche Diagnostics assay, along with serum

creatinine, uric acid, calcium by Cobas c 111 analyzer and urinary phosphorus.

RESULTS AND DISCUSSION:

Table (1) compares the mean ± SE clinical parameters in preeclampsia and control group. The findings of this study revealed that although TT4, TT3, FT4, and FT3

are lower in PE women, there is non- statistically significant change in TSH levels, while calcium levels between the two groups did not differ statistically significantly , and PE affected women had considerably greater than the control group in S.creatinine, and uric acid , also there were significantly lower U.phosphorous in PE group.

Table (1): Characteristics of clinical parameters between patients with preeclampsia and control group

Parameters	Mean ±S.E		P. value
	Control NO.=30	Patients NO.=30	
TSH(UIU/ml)	4.45±0.50	5.13±0.14	0.192
TT4(nmol/L)	4.24±0.15	2.05±0.09	0.0001
TT3(nmol/L)	80.14±1.52	6.15±0.43	0.0001
FT3(pmol/L)	5.27±0.12	1.79±0.09	0.0001
FT4 (pg/ml)	13.99±0.60	3.93±0.26	0.0001
Urea(mmol/L)	4.41±0.23	5.20±0.22	0.018
S. creatinine (µmol/L)	39.05±0.54	64.70±1.76	0.0001
Uric acid(µmol/L)	287.08±13.76	324.41±11.62	0.043
Calcium (mg/dl)	8.98±0.12	8.49±0.26	0.092
U. phosphorous (mg/dl)	4.66±0.14	3.71±0.14	0.0001

The study conducted by (6) showed TSH levels were greater in PE, which is consistent with other investigations (7-9) even though poor placental function can prevent the generation of estrogen, which lowers TBG levels and can be the cause of increased TSH secretion (10). According to other studies, PE women have elevated levels of anti-angiogenic factors, which in turn reduce nitric oxide production, however, in some research, TSH levels in PE were not higher than those in normal pregnant women (11), this is consistent with our findings, hypothyroidism may result as a result of decreased thyroid capillary flow (9). In a healthy pregnancy, estrogen (E2) raises serum TBG, but in PE low E2 levels cause serum TBG , while TT3 and TT4 lowered by preeclampsia's placental malfunction (12), the hypothesis appropriate to these circumstances is that the liver's ability to convert T4 to T3 is impaired, which may be the cause of the low level from FT3 in women with PE, our findings showed that low FT3 levels in PE were significantly different from control group (13-15). Also, The results of the current study demonstrated that FT4 levels were lower in PE patients, which is consistent with other studies' findings (9, 15). Whilst results from certain investigations indicated the FT4 level in PE was higher (16, 17), disagreement with our study. According to studies carried out in some countries, endothelial dysfunction causes reduced glomerular filtration rate, which leads to hyperuricemia in PE (18-21), this agreement with our study. PE women's serum

uric acid levels were significantly higher in the third trimester of pregnancy when compared to normal pregnant women, some investigations suggested that the uric acid level was not significantly change in the first and second trimesters of pregnancy, in contrast to a prospective and retrospective study carried out in China (22). Renal excretion of calcium and phosphate rising through pregnancy every trimester typically sees an increase in excretion leading to an increase in renal filtration rate, the greatest level is reached is during the third trimester, changes in calcium and phosphate excretion, are significant findings in hypertension and several renal diseases in general (23) in keeping with our study, although with non-significant results . Chhabra et al.,(24) showed that fractional excretion from calcium in PE was lower in the third trimester than it was in control. Additionally, hypophosphaturia is a significant symptom from PE and is likely indirectly connected to the decreased renal function found in pregnancy-associated toxemia (25).

CONCLUSION:

In this study, we found PE women were more likely to experience changes in thyroid function tests, according to the analysis' findings. We also found that calcium and urine phosphorus levels may be significant determinants of preeclampsia and may be useful markers of predicting the level of renal. Thyroid function testing for women

with pre-eclampsia are advised in order to identify thyroid abnormalities and avoid them.

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