

Determination of IL6,CRP, Liver Function Tests in women with Pregnancy Induce Hypertension in Tikrit City-Iraq

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Abstract:

Background: Abnormalities of cytokine IL6, CRP and other parameters in women with pregnancy induce hypertension (PIH) have been confirmed in several studies. Although their cause-effect relationships to PIH are not yet clear. **Aim:** To study the relationship of serum IL6, CRP and other parameters with pregnancy-induced hypertension. **Patients and Methods:** Fifty patients with gestational hypertension, 50 pregnant women as control, serum was collected to determine serum IL6, CRP, AST and ALT.

Results: Statistically significant differences were found in IL-6 level and CRP whereas a difference was not present in uric acid levels between PIH and control. In regard to liver function test, there is no significant differences of serum albumin were observed between PIH patients and controls, while there are significant differences regarding serum GGT, ALT and AST.

Key words: PIH, liver function, IL-6, CRP.

Introduction

Hypertension in pregnancy is one of the most prevalent disorders, representing about 10% of pregnant women, (1). The PIH considered a major problem in hypertensive diseases complicating pregnancy in developing countries that affect both the mortality and morbidity of mother and fetal health (2).

The most common causes of PIH.

A- Oxidative stress, which can cause the formation of inflammatory factors lead to hypertension. **B-** Heredity and genetic factors. **C-** Immunologic disorder can lead to PIH, and it is considered that the occurrence of hypertension in pregnancy is related to ischemic changes in placenta. It has been reported by many studies that the immunological hypothesis is improved in the PIH development (3-6).

Many studies have found that elevated IL-6 level in patients with PIH than that in patients with normal pregnancy, they found maternal and infant prognoses with high level of IL-6 are worse than those with normal IL-6 level, suggesting that IL-6 extend effects on the prognosis of patients with gestational hypertension, (7). Previous study, shown that elevations in inflammatory cytokines interleukin-6 play an effect in the pathogenesis of hypertension, (8). It has been founded by scholars for several years that CRP is a non-specific inflammatory marker. However, recent years have recognized found a good relation between CRP and the poor outcomes of pregnancy, such as PIH and stillbirth, (9,10).

Several hypotheses have been approaching for the pathogenesis of disease and include imbalance of prostacyclin – thromboxane, immunogenic, endothelial dysfunction, and relative or absolute placental ischemia [11].

It is believed that "failings" in structure of normal hemochorial placental lead to PIH, (12).

The genetic factors of PIH is define, as women with positive family history of the PIH are three times more susceptible to suffer from it when they are pregnant, (13).

The **aim** of the study is to determine the IL6, CRP, AST and ALT in women with pregnancy induce hypertension in Tikrit city-Iraq.

Patients and Methods:

A case-control study, was done on fifty pregnant women attending with pregnancy induce hypertension (PIH) treated in General Salah Alden Hospital on Tikrit city from January to April 2018. Other 50 normal healthy pregnant women at the same period were selected as the control group. The average age of these 100 pregnant women was 27.1 ± 5.0 years. All of them assessed physically examination like blood pressure

measurement. Patient with hypertension when systolic blood pressure was >140 mm Hg and diastolic blood pressure was >90 mm Hg .

The blood samples were taken after 12-14 hours of fasting for measuring serum lipid profile by standard clinical laboratory procedure.

IL-6 was assayed using Quantikine R and D systems, ELISA kit. CRP was measured by using nephelometry method, uric acid, liver functions, (serum albumin, AST, ALT, GGT) use spectrophotometric.

Statistical analysis was done by chi square, student T test and one way ANOVA. All data values were expressed as mean \pm standard deviation. P-values of less than 0.05 or less were considered as statistically significant.

Results:

The present study included one hundred pregnant women; they were divided into fifty hypertensive pregnant women, (PIH), and fifty pregnant women without hypertension as control group.

Table(1) show compares between serum of subjects associate inflammatory factors IL-6 and CRP in pregnant induce hypertension (PIH), and control groups, there is significant difference was found Patients and controls, (8.17 ± 2.4 versus, 6.67 ± 1.9 , $p < 0.05$), (18.2 ± 8.3 , versus, 7.5 ± 2.5 , $p < 0.05$) respectively.

Table(2) In the present study, pregnant women with PIH had a significantly increase liver enzymes, (GGT, ALT and AST), (28.04 ± 11.1 versus, 20.1 ± 6.2 , $p < 0.05$), (33.5 ± 8.5 versus, 26.6 ± 7.4 , $p < 0.05$), (29.9 ± 7.1 , versus, 23.2 ± 5.9 , $p < 0.01$) respectively as compared with normal pregnancy group. However, there was no significant difference concerning the serum albumin and uric acid between the patients and controls, (**Table 2**).

Table (1) show serum concentration of IL-6 and CRP in patients with PIH and normal pregnant control women.

Parameters	PIH Patients	Controls	P value
IL6 (pg/ml)	8.17 ± 2.4	6.67 ± 1.9	< 0.05
CRP (mg/ml)	18.2 ± 8.3	7.5 ± 2.5	< 0.05
IL-6= interleukin-6; CRP=C-reactive protein, PIH= pregnancy induced hypertension.			

Table (2) show characteristics of liver enzymes activities and serum albumin concentration in women with PIH and normal control pregnant women.

Parameters	Patients	Controls	P value
GGT (mg/dl)	28.04±11.1	20.1±6.2	0.05
ALT (mg/dL)	33.5±8.5	26.6±7.4	0.05
AST(mg/dl)	29.9±7.1	23.2±5.9	0.01
Serum Albumin(mg/dl)	191.2±51.4	189.4±33	NS
uric acid	5.79±1.9	5.4±1.4	NS
AST=aspartate aminotransferase ,ALT=alanine aminotransferase, GGT= Gamma-GlutamylTransferase			

Discussion

Many scholars believed that PIH is related with immune imbalance, and cytokines, especially inflammatory factors, had a significant roles in immune regulation.(14). In the present study, the levels of IL-6 in patients with PIH were significantly higher than those in the normal pregnant women ($p<0.05$), this finding is agree with previous studies. (15,16). Also, Previous study found that Interleukin-6 (IL-6), stimulating angiotensin type 1 receptor lead to increase angiotensin type 11 which potent vasoconstriction (16, 17).

In the present study, there is significant elevation in serum CRP in patient with PIH as compare with normal pregnant women. C-reactive protein (CRP) which is a non-specific inflammatory-related protein produced by the liver and regulated by plasma interleukin-6, (18). Also, previous studies found that serum CRP was significantly elevated in patients with PIH, (19, 20,21).

It has been hypothesized that hypertension may be in part an inflammatory disorder. Higher levels of CRP may increase blood pressure by reducing nitric oxide production in endothelial cells, causing vasoconstriction and increasing endothelin-1,(14, 22-24).

Another study done in china, the result of this study was not agree with the present study,(25).

Liver function test (LFT) abnormalities occur in 3% of the pregnancies, and usually disappear after delivery, as the liver cannot metabolize quickly the large quantity of

estrogen and progesterone produce during pregnancy, (26-28). In hypertensive pregnant women, liver enzymes activities, showed that AST, S.ALT and S.GGT were significantly higher in PIH patients as compare with controls. However, significant difference was not observed in albumin groups, (29-30). However, the present study disagrees about albumin elevated level of ALT and AST in hypertensive pregnancy was also cited by some other studies, (31-32).

In present study serum GGT level was significantly increased in PIH patients when compared to controls. Similar results were documented by other studies, (33-34).

Conclusion

Results showed that the IL-6 protein level was positively correlated with pregnancy induce hypertension.

Recommendation

1-The results of these types of studies will be advantageous to further our knowledge of the pathophysiological ramifications associated with PIH and to further therapeutic development for this disease.

2- Further studies should be performed for causative factor responsible for elevated IL6 production that subsequent PIH, and possible therapeutic intervention in the management of PIH.

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