

HUMAN PLACENTAL LACTOGEN LEVELS IN PREECLAMPSIA-ECLAMPSIA

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SUMMARY

Human placental lactogen (HPL) levels were studied in 44 hypertensive patients and 23 healthy pregnant woman. HPL levels were in normal ranges in healthy pregnant women, but low HPL levels found in the hypertensive patients. HPL levels were related with severity of the disease in patients with gestational hypertension. We suggest that HPL levels may be used as an index of placental function but no foetal health in the patients with gestational hypertension.

ÖZET

44 hipertansif hamilelikte ve 23 sağlıklı hamilelikte insan plasenta laktojen hormonu (HPL) seviyeleri ile plasental fonksiyonlar arasındaki ilişkileri araştırdık. HPL seviyelerini sağlıklı hamileliklerde normal değerlerde fakat hipertansif olanlarda düşük seviyelerde bulduk. HPL seviyelerinin hipertansiyonun şiddeti ile ilişkili olduğunu saptadık. Sonuçlarımız HPL seviyesinin gestasyonel hipertansiyonda plasenta fonksiyonu için bir ölçü olabileceğini fakat fetal sağlık için bilgi veremeyeceğini düşündürdü.

INTRODUCTION

It has been suggested that serum Human Placental Lactogen (HPL) levels may be a useful prognostic index of placental function (1,2). It has been reported that the amount of HPL in a given area of the placenta was related to the blood flow in that area (3). Some authors have been found out the usefulness of routine pregnantal HPL measurements in the management of high risk pregnancies (4). The aim of our study is to determine whether serum HPL levels may be used as a prognostic index of placental function and foetal in the patients with gestational hypertension.

MATERIAL AND METHOD

We studied HPL levels in 44 patients with gestational hypertension during 1989.

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26 healthy pregnant woman whose blood pressures were 120/80 mmHg were selected control groups Control had no history of any disease and drug use.

The patient group selection was based on a diastolic pressure which was 90 mmHg, at least two different measurements after 6 hours bedrest.

The hypertensive patients were evaluated according to age, parity, diastolic blood pressure, systolic blood pressure, birth weights, gestational weeks, apgar scores, degree of oedema and proteinuria.

The foetal outcome was considered to be favourable if a healthy baby was discharged with the mother or unfavourable in case of perinatal death or a prolonged stay in the neonatal care unit. We classified the patients as mild preeclampsia, severe eclampsia and eclampsia.

HPL levels were determined by RIA. We studied serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (GSPT), lactate dehydrogenase (LDH), total serum protein, urea, creatinine, uric acid, total lipid, cholesterol, alkaline phosphatase, glucose, fibrinogen, factor VIII (FVIII), partial thromboplastine time (PTT), pro thrombin time (PT), thrombin time (TT), haemoglobin, serum iron (SI), serum iron binding capacity (SIBC), prolactin, Alfa fetoprotein (AFP), progesterone, anti thrombin III (AT III), estradiol (E2), Estriol (E3), aldosterone, dehydroksiepiandestrone sulphate (DHEA-S), angiotensin II, in addition to HPL in hypertensive patients. We investigated HPL levels in relation with above parameters.

The used statistical methods were pearson correlation coefficient method, student test, chi-square test and mean values and standart deviations of variables.

RESULTS

In control groups: Mean maternal age was 29 (range, 19 to 40 years). Mean gestational week was 38 (range, 30 to 40 weeks). Mean diastolic blood pressure was 70 mmHg (range, 60 to 80 mmHg). Mean systolic blood pressure was 106 mmHg (range, 90 to 120 mmHg).

In the hypertensive patients: Mean maternal age was 29 (range, 16 to 44 years). Mean diastolic pressure was 111 mmHg (range, 90 to 160 mmHg). Mean systolic blood pressure was 171 mmHg (range, 140 to 280 mmHg). Mean gestational week was 35 (range, 24 to 40 weeks). Mean parity was 3 (range, 0 to 11).

The hypertensive patients were classified as mild preeclampsia (8 case), severe preeclampsia (16 cases) and eclampsia (20 cases).

HPL levels were significantly low in the hypertensive patient compared with healthy pregnant woman ($P < 0.001$). As shown in Table-1, mean HPL levels was

3.88 mcg/ml in the hypertensive patients.

Table 2: The maternal plasma HPL levels in patients and controls.

HPL levels (mcg/ml)	Mean	±SD	Min.	Max	n
Patients	3.88	3.75	0.08	13.2	44
Controls	7.61	2.66	3.7	13.3	23
t=4.717 p<0.001					

Serum HPL levels in correlation with above parameters were studied. HPL levels were correlated with fibrinogen levels ($r=0.415$, $p<0.01$), F VIII levels ($r=0.371$, $p<0.05$), blood urea ($r=-0.30$, $p<0.05$) and progesterone ($r=0.333$, $p<0.05$). Serum HPL levels had no a significant relation with SGOT, SGPT, creatinine, LDH, alkaline phosphatase, E2, E3, DHEA-S, AFP, Haemoglobin, AT III, PTT, PT, TT, total serum protein, glucose, total lipid, cholesterol, SI, SIBC, aldosterone, angiotensin II and uric acid.

Serum HPL levels were related with gestational week ($r=0.309$, $p<0.05$), birth weights ($r=0.299$, $p<0.05$), diastolic blood pressure ($r=-0.446$, $p<0.01$) and systolic blood pressure ($r=-0.381$, $p<0.05$). HPL had no relation with ages and parities of the patients. HPL levels were no related with the degree of proteinuria and oedema. HPL levels in relations with severity of the disease was shown in Table 2. HPL levels in severe preeclampsia were significantly low than mild preeclampsia ($p<0.001$).

Table 2: HPL levels (mcg/ml) in relation with severity of the disease.

Clinical picture	Mild (A)	Preeclampsia Severe (B)	Preeclampsia Eclampsia (C)
HPL levels	8.71 ± 3.74	2.20 ± 1.95	3.34 ± 3.36
(mean + SD)	n=8	n=16	n=20
A-B	t=4.619		p<0.001(S)
A-C	t=3.531		p<0.01 (S)
B-C	t=1.273		p>0.05 (NS)

Although we found the low levels of HPL in small gestational ages deliveries and preterm deliveries than term deliveries, it was not statistically significant (Table-3).

Table 3:HPL levels (mcg/ml) in small gestational ages (SGA), preterm and term delivery.

	SGA	Term	Preterm
HPL levels	3.86 ± 3.5	4.85 ± 4.19	2.69 ± 2.71
Mean + SD	n=6	n=16	n=22
SGA - Term	t=0.558		p>0.05 (NS)
SGA - Preterm	t=0.756		p>0.05 (NS)
Term - Preterm	t=1.795		p>0.05 (NS)

Mean HPL levels were lower in the mothers with unfavourable infants compared with favourable infants, but it was not statistically significant (t=0.864,p>0.05 (NS)).

DISCUSSION

Previous data on the levels of HPL in relation to preeclampsia are controversial. HPL levels in preeclampsia have been reported as low, normal or high in some articles (5,6,7).

Our results in indicated that serum HPL levels in preeclampsia-eclampsia were significantly low compared with normal pregnancies. HPL levels decreased when the disease got more serious. HPL remained at low levels when the blood pressure increased. HPL levels decreased simultaneously with fibrinogen consumption of F VIII. All these data suggested that placental circulation was impaired by activation of blood coagulation system with subsequent fibrin formation and increased vasoconstriction. HPL levels decrease as a result of placental dysfunction.

We think that the poor foetal outcome is an effect of placental dysfunction in the hypertensive patients. As a result, we concluded that low HPL levels indicated the presence of placental dysfunction.

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