

RADIO-IMMUNOASSAY OF HPL IN EVALUATION OF FETAL WELL BEING IN PRE-ECLAMPSIA

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SUMMARY

Significance of HPL was evaluated by radio-immunoassay in estimation of fetal well-being in cases of Pre-eclampsia. The study consisted of thirty-two pregnant women in third trimester which includes twenty cases of pre-eclampsia and twelve normal pregnant women in their third trimester as control. In pre-eclampsia, HPL level was significantly lower than normal pregnancy.

In the present study, there was no statistically significant correlation found between Apgar Score and HPL. However, when fetal weight was correlated with HPL level, highly significant correlation was found.

Thus serial determination of plasma HPL may be a valuable complement to other aids in the supervision of pregnancies complicated by pre-eclampsia.

INTRODUCTION

Many conditions which affect fetal health are largely placental in origin. Indeed the practice of hormone assay to evaluate fetal wellbeing owes much to the concept of placental insufficiency. Measurement of placental hormones can give valuable insight

into the fetal status. The purpose of this work is to evaluate the clinical significance of HPL radio-immunoassay. The assay has been performed in normal pregnancy (third trimester) and in pre-eclampsia.

MATERIAL AND METHODS

The series consists of thirty-two females comprising of twelve normal pregnant females and twenty pre-eclamptic cases.

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Samples of venous blood in a heparinised state were drawn from each patient at different times during the study period. The plasma was separated by centrifugation and stored at -20°C until the assay was performed.

HPL kit was available from radiochemical centre, Amersham, U.K. Thus by measuring proportion of iodinated (I) HPL bound in the presence of reference standard sera containing varying amounts of HPL, the concentration of HPL present in the

unknown samples was made out from the reference standard curve.

OBSERVATION

In the normal pregnancy group, the mean HPL level was 6.28 microgram/ml with standard deviation of 1.11 (Table I).

Twenty cases of pre-eclampsia were studied. Mean HPL level was 5.27 + 2.2. This was significantly (0.01) low

Table I
COMPARISON OF HPL LEVEL AND FETAL WEIGHT
IN NORMAL PREGNANCY AND PRE-ECLAMPSIA.

| | HPL level in ug/ml | Fetal weight (gms) |
|--------------------|--------------------|--------------------|
| Normal Pregnancy : | | |
| Mean | 6.28 + 1.11 | 2583.33 + 270.80 |
| Pre-eclampsia : | | |
| Mean | 5.27 + 2.20 | 2789 + 331.18 |
| t | 2.92 | 1.80 |
| p | 0.01 | 0.1 |

Table II
CORRELATION OF HPL LEVEL AND FETAL WEIGHT IN
NORMAL PREGNANCY AND PRE-ECLAMPSIA (P VALUE)

| | p value |
|--|---------|
| Fetal weight and HPL level in normal pregnancy | 0.001 |
| Fetal weight and HPL level in pre-eclampsia | 0.05 |

as compared to normal pregnancy (6.28 + 1.11) Table I. There was highly significant correlation between fetal weight and HPL level ($P < 0.05$) (Table II).

However, the Apgar Score and HPL level were compared and they were not statistically significant ($P > 0.6$).

DISCUSSION

The assessment of fetal well-being in utero is extremely important with a view to reduce the perinatal mortality and morbidity.

Level of HPL in maternal serum is an accurate reflection of the functional integrity of placenta throughout pregnancy (Saxena et al 1969). Keller et al (1971) using measurements of estriol, pregnandiol, HSAP, DHA-loading HPL, observed that the latter appeared to be the best single predictive test.

Serum levels at term ranged between 6-10 microgram per ml as compared to 10-15 nanogram per ml at 5-6 weeks (Friesen 1976).

In normal pregnant cases, all of them had spontaneous vaginal delivery with mean birth weight of 2583 + 270.80 gms. All the babies had Apgar 9/10. The mean HPL level was 6.28 + 1.11 microgram/ml and this was in full confirmity with other workers (Saxena et al. 1969, Samman et al. 1971 and Letchworth A.T. 1976).

In the present series mean birth weight in normal pregnancy was 2583.3 + 270 gms. and there was a highly significant ($p < 0.001$) linear

correlation between birth weight and HPL level (Table II). This finding is not in agreement with Ylikorkala (1973) who found no significant correlation between HPL and fetal weight in normal pregnancy.

In cases of pre-eclampsia, the mean HPL value is lower than the normal (Letchworth et al 1972). The low plasma HPL values indicate that placental function was insufficient and inhibited the growth potential of the fetus (Lindberg et al, 1973). The low Apgar score might have been due to an inability of the placenta to meet the extra stress of labour. Infants of mothers with pre-eclampsia and plasma HPL values below 4 microgram/ml had a high perinatal mortality and high incidence of low birth weight (Lindberg et al, 1973). After thirty weeks of gestation there are few normal values of less than 4 micrograms/ml and accordingly this low area free of values has been termed Fetal Danger Zone (FDZ) (Spellacy et al. 1971, and Spellacy 1973).

In the present series only 3 cases of pre-eclampsia (out of seven cases) had values in FDZ with low Apgar Score at birth. There was significant correlation ($p < 0.05$) between fetal weight and HPL level in cases of pre-eclampsia (Table II), which was also in confirmity with findings of Ylikorkala (1973).

REFERENCES

1. Friesen H.G., William Singer : *Perinatal Medicine* Ed. Goodwin, J.W. Godden, J.O.,

Chance, G. W., 1976.

2. Keller P.J., Bartschill Baby P. : *Lancet*. 2 : 729, 1971.
3. Letchworth A.T., Chard T. : *Lancet*. 1 : 704, 1972.
4. Letchworth A.T. : *Plasma Hormone Assays in Evaluation of fetal wellbeing* (ed.) A. Klopper. Publisher Churchill Livingstone (London), p. 147, 1976.
5. Lindberg B.S., Martinsson K., Lindberg P., Nilsson B.A. and Johansson E.D.B. : *Acta. Endocrinol.* 177: 231, 1973.
6. Samman N.A., Gallager H.S., McRoberts W.A. and Faris A.M. (jr.) : *Am. J. Obstet. Gynec.* 109 : 63, 1971.
7. Saxena B.N., Emerson K. and Selenkow H.A. : *New York J. Med.* 281 : 225, 1969.
8. Spellacy W.N., Teah E.S., Buhi W.C., Birk S.A. and McCreary S.A. : *Am. J. Obstet. Gynec.* 109 : 588, 1971.
9. Spellacy W.N. : *Clin. Obstet. Gynec.* 16 : 298, 1973.
10. Ylikorkala O. : *Acta. Obstet. Gynec. Scand. Suppl.* 26 : 8, 1973.

NON STRESS TEST VERSUS DOPPLER VELOCIMETRY
IN THE PREDICTION OF FETAL OUTCOME

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SUMMARY

In the present study, the predictive value of non stress test and umbilical artery AB ratio was compared in 42 patients. There were obstetric risk factors in 22 patients. 12 pregnancies culminated in adverse perinatal outcome. NST was found to have specificity 82.71%, sensitivity 74.19% and positive predictive value 80%. The corresponding values with umbilical artery AB ratio was 88.46%, 77.77% and 77.77% respectively. As an indicator of perinatal outcome in high risk patients, the specificity of NST was 82.71% and the sensitivity was more than 100%. Corresponding values for AB ratio were 68.42% and 100% respectively. Absence of non-stress reactivity in the umbilical artery was associated with adverse perinatal outcome.

Thus Doppler velocimetry compares favourably with NST as a fetal surveillance tool and as an indicator of foetal outcome in high risk pregnancy. We as obstetricians, should utilize this sensitive tool fully in the management of high risk pregnancies.

INTRODUCTION

The prediction of foetal outcome in high risk pregnancies is a major task of management. The non stress test (NST) and Doppler velocimetry are the two most commonly used tools for this purpose. The NST is a simple, non-invasive test which is easy to perform and interpret. It is a valuable tool in the management of high risk pregnancies. The Doppler velocimetry is a more sophisticated test which provides information about the blood flow in the umbilical artery. It is a valuable tool in the management of high risk pregnancies.