

# THE STUDY OF SERUM PLACENTAL LACTOGEN IN ABNORMAL PREGNANCIES

by

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The serum HPL estimation has recently been used to assess placental function in various obstetric disorders. A better foetal outcome depends a lot on placental function in complicated pregnancies, i.e. diabetes, twins, placental insufficiency and antepartum haemorrhage.

The present study was undertaken to evaluate placental function by estimating serum HPL by radioimmunoassay, and to find out its usefulness in clinical obstetrics.

## Material and Observations

Group I—65 normal pregnancies were studied at various periods of gestation as shown in graph I.

Group II—179 abnormal pregnancies were selected as follows:

Threatened abortion	25 cases
Diabetic pregnancies	13 "
Twins	31 "
Bad obstetric history	48 "
Placental insufficiency	31 "
Antepartum haemorrhage	31 "
	—
	179 cases

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Accepted for publication on 8-6-82.

1. *Abortion*: Ten cases were between 8-10 weeks pregnant, and the serum HPL ranged between 0.01  $\mu\text{g/ml}$  and 0.23  $\mu\text{g/ml}$  (normal value between 0.05-0.07  $\mu\text{g/ml}$ ). Four continued their pregnancy, but all 6 who had HPL value less than 0.03  $\mu\text{g/ml}$  aborted.

Nine cases of threatened abortion were 12-16 weeks gestation. The serum HPL ranged between 0.1  $\mu\text{g/ml}$  and 1.8  $\mu\text{g/ml}$ . Six aborted and 3 continued their pregnancies. One case clinically diagnosed as missed abortion showed HPL level of 0.22  $\mu\text{g/ml}$  at 16 weeks pregnancy. (Normal level—0.8  $\mu\text{g/ml}$ ).

*Evacuation followed*: The other 4 who aborted had HPL value less than 0.3  $\mu\text{g/ml}$ . One patient aborted despite the normal HPL level of 0.8  $\mu\text{g/ml}$  at 16 weeks, due to incompetent os, a purely mechanical reason. The placenta appeared normal.

HPL levels in cases studied between 20-24 weeks varied between 0.8  $\mu\text{g/ml}$  to 1.35  $\mu\text{g/ml}$  (normal mean level between 1.1  $\mu\text{g/ml}$  and 1.3  $\mu\text{g/ml}$ ). All women with level less than 1  $\mu\text{g/ml}$  aborted, and 1 with the level of 1.35  $\mu\text{g/ml}$  continued her pregnancy.

*Diabetic pregnancy*: Of the 13 cases, 5 had been on insulin over 3 years, and 2 of these developed P.E.T. The rest were controlled on diet alone.

Graph 1 shows the serum HPL levels. The levels were raised in all but 2 cases complicated by PET, where the levels were lower than normal. The HPL levels correlated well with the placental weight, and with the foetal weight. One case complicated by anencephaly and hydramnios had HPL level of 12.5  $\mu\text{g}/\text{ml}$  at 36 weeks. The serum levels had no bearing on whether diabetes was controlled on diet alone or with insulin.

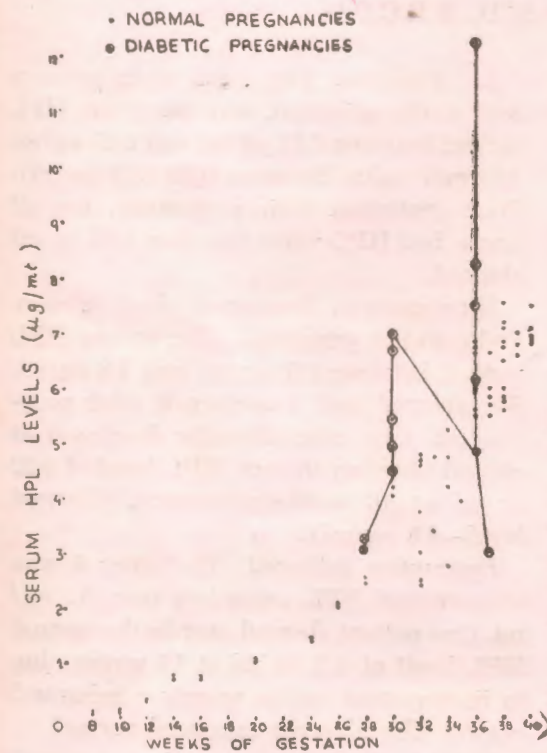


FIG. 1

3. *Twins*: Graph 2 shows significantly high HPL levels in twins. Four pregnancies complicated by mild PET also demonstrated higher HPL levels for the corresponding period of gestation.

4. *Bad Obstetric history*: Twelve cases had incompetent os, and McDonald suture had been inserted. All had normal HPL levels and all delivered normally at term.



Fig. 2

One syphilitic mother with a normal HPL value delivered a live baby following treatment.

In 33 women, no cause for previous abortion or stillbirth was found. The HPL levels were within the normal range of that particular period of gestation and all delivered live babies at term.

One woman with previous premature labour had HPL value of 3  $\mu\text{g}/\text{ml}$  at 30 weeks. All investigations were normal. This time too she delivered prematurely at 32 weeks. Baby weighing 1 kg. died. The placenta weight 150 gms.

Another patient had low HPL level of 2.95  $\mu\text{g}/\text{ml}$  at 34 weeks and a repeat estimation of 4.2  $\mu\text{g}/\text{ml}$  at 38 weeks. The baby weighed only 1.7 kg. and placenta 300 gms.

5. *Placental insufficiency*: Graph 2 shows HPL levels in this group. Four cases associated with PET had lower HPL

values. The babies weighed less than 2.500 kg and mean placental weight was 350 gms.

No cause was found in the remaining 27 cases. Twenty-two cases had lower HPL levels, and all babies were underweight. The placenta too weighed less than average weight. Five patients showed normal HPL levels over 6  $\mu\text{g/ml}$  after 36 weeks gestation and 3 delivered normal weight babies and normal sized placenta. Two women with normal levels delivered very small babies weighing 2.1 kg. and 1.7 kg. respectively and placenta weighed 300 gms.

6. *Antepartum haemorrhage*: All 6 cases of placenta previa had normal HPL levels, and all delivered by caesarean section.

Twenty-five cases were of accidental haemorrhage. Four cases were associated with mild PET. Twenty-four cases of these cases had successful induction of labour. The HPL values were within normal limits so also was the birth weight and placental weight.

One case of concealed accidental haemorrhage delivered a stillborn baby weighing 1.2 kg at 32 weeks. HPL level was 2.04  $\mu\text{g/ml}$  and placenta weighed 2.20 gms.

#### Discussion

*Abortion*: In the present series, all the patients with low HPL aborted, whereas all but 1 with normal values continued their pregnancy. This particular case with a normal HPL aborted due to incompetent os, and the placenta appeared normal. Similar results have been earlier reported by Genazzani *et al* (1971), Niven *et al* (1972), Crosignani *et al* and Bhatia *et al* (1979).

Saxena (1969) found as low as one third the normal values in cases who

eventually aborted. Though such a low level was not observed in the present series, 1 case of missed abortion had nearly one fourth the normal level when seen at 16 weeks gestation.

Ylikorkala (1973) suggested serial assays which would give a better prediction of outcome in threatened abortion.

2. *Diabetic pregnancy*: The serum HPL levels were high in uncomplicated and controlled diabetes, and the levels correlated well with the birth and placental weights. HPL level had no bearing on whether the woman was on insulin or not. These findings tally with those described by Genazzani *et al* (1971) and Saxena *et al* (1968). The HPL level was low if diabetic pregnancy was complicated by PET. Similar findings were earlier reported by Spellacy *et al*.

It appears that a single reading has no value in assessing foetal maturity and its status in a diabetic pregnancy. Letchworth and Chard (1972) proposed serial assays to be of any prognostic value in these pregnancies.

3. *Twins*: HPL levels were high, but of no value in assessing foetal maturity and placental function. It may have diagnostic value in early weeks and to differentiate it from hydatiform mole which shows extremely low HPL level. After 28 weeks, radiology and ultrasound supersede for laboratory serum studies which may prove, time consuming.

*B.O.H.*: H.P.L. study is useful so far as it indicates placental function. The other causes need to be excluded and treated.

*Placental insufficiency*: A low HPL reading was obtained in 84% cases and a normal level in 16% cases. The levels correlated well with the foetal as well as the placental weight. Similar findings have been reported by Saxena *et al* (1968) and Gohari *et al* (1978). Lindberg *et al*

(1973) found low HPL level of considerable prognostic significance and helped in salvaging the baby by timely induction. Edwards observed that HPL level below 4  $\mu\text{g/ml}$  after 35th week was often associated with low apgar score.

#### *Antepartum haemorrhage*

The HPL value has neither a prognostic nor a therapeutic value in these cases. Genazzani (1971) showed a fall in the level during the episode of bleeding but the level returned to normal after once bleeding stopped.

#### *Acknowledgement*

We are thankful to the Medical Supdt., LNJP Hospital and Dean, M.A. Med. College and Prof. & Head of the Dept. of Obst. & Gynaecology for their kind permission to publish this paper.

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