LEVELS OF HPL IN INDIAN WOMEN

by

VIJAYA RAGHAVAN,*
A. R. SHETH,*
SHANTA S. RAO,*
SVATI DAVE,*
M. PURANDARE,**
and
B. N. PURANDARE**

Introduction

A number of reports have appeared on the levels of human placental lactogen (HPL) throughout pregnancy for Western women, though not much data are available for levels in Indian women. Our studies on urinary HCG levels throughout pregnancy indicate lower levels (Raghavan *et al* 1973) and that of Iyengar (1970) indicate lower levels of urinary pregnanediol in the Indian women. Hence, the present study was undertaken to study the serum profile of HPL throughout pregnancy using a radioimmunoassay technique.

Materials and Methods

Reagents required for the radioimmunoassay of HPL were kindly supplied by NIAMD, Bethesda, U.S.A. The antiserum was stored at -20°C. HPL was labelled with I^{125} using Chloramine T, according to the method described by Midgley (1966). HPL was expressed in ng/ml serum, in terms of NIH-HPL standard. Assays were carried out using the double-antibody technique.

Collection of Samples

Three hundred and eighty seven random blood samples were obtained from women attending the N.W.M. Hospital. Women selected for the study met the following criteria:

(i) they had normal pregnancies without complications
(ii) had no bad obstetric history and
(iii) knew the date of their last menstrual period.

The serum samples were diluted before testing, depending on the period of pregnancy as follows:

Duration of pregnancy	Dilution
30– 70 days	—
71– 90 days	1 : 20
91–180 days	1 : 50
181– to term	1 : 100

Results

The mean HPL (± S.E.) values in 387 samples are presented in Table I. A marked increase in hormone concentration is noticeable around 16th to 36 weeks

*Institute for Research in Reproduction, Jehangir Merwanji Street, Parel, Bombay 400 012, India.
bay 400 012, India.
**N. Wadia Maternity Hospital, Parel, Bom-
Accepted for publication on 26-6-76.

TABLE I
Serum HPL Throughout Pregnancy

Gestation period in days	No. of Obs.	Mean ng/ml	±	S.E.
31– 40	39	10.1	±	2.19
41– 50	76	25.7	±	3.82
51– 60	22	34.1	±	7.89
61– 70	15	145.7	±	46.7
71– 80	9	245.42	±	13.03
81– 90	9	946.52	±	189.4
91–100	12	1072.29	±	239.0
101–110	9	2796.6	±	349.3
111–120	5	2425.0	±	384.0
121–130	8	2799.6	±	631.0
131–140	10	3514.9	±	475.0
141–150	5	3134.9	±	389.0
151–160	9	3587.5	±	216.1
161–170	12	3404.7	±	328.0
171–180	10	3738.75	±	552.0
181–190	19	5173.68	±	480.0
191–200	23	6653.8	±	332.0
201–210	18	6702.5	±	649.0
211–220	17	6558.8	±	670.0
221–230	11	6284.0	±	372.0
231–240	12	7114.5	±	725.0
241–250	11	8443.0	±	1015.0
251–260	11	7520.4	±	728.0
261–270	7	7750.0	±	970.0
271–	8	9796.0	±	950.0

of pregnancy. The normal range of levels with 95% fiducial limits are depicted in Fig. 1. Very low HPL levels are seen in early pregnancy upto 12 weeks after which a gradual increase in levels is seen upto term.

Discussion

A number of reports are available on the HPL levels in normal and complicated pregnancies. The general pattern of HPL throughout pregnancy is agreed upon by all workers, though a difference exists on the values observed at term. A wide variation in the values of HPL at term have been reported viz. 3.9 to 25 ng/ml. (Kaplan and Grumbach, 1965; Beck and Daughaday 1965; *et al* 1965; Spellacy *et al* 1966; Samaan *et al* 1966;

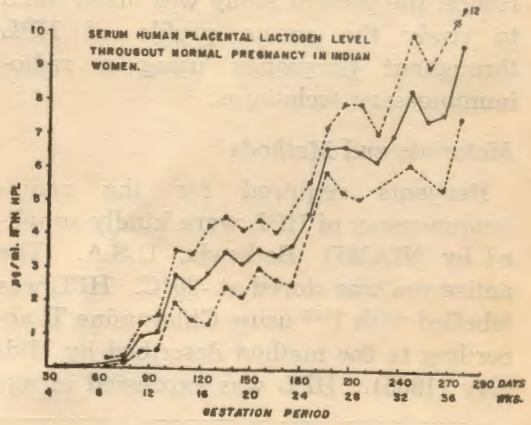

Fig. 1

The figure depicts serum human placental lactogen levels throughout pregnancy in the Indian women. The dark unbroken line represents the mean levels and the broken lines indicate the 95% fiducial limits.

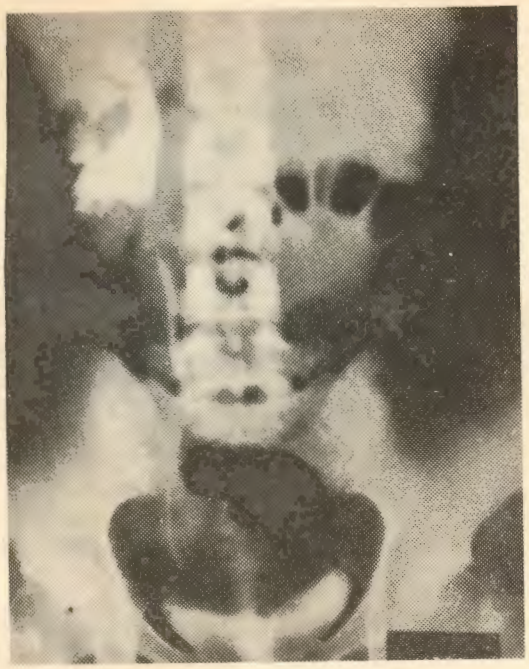

Fig. 1
I.V.P.: Fullness of calyces and pelvis of right side with narrowing at pelviureteric junction due to partial obstruction by a congenital band. Left kidney is nonfunctioning.

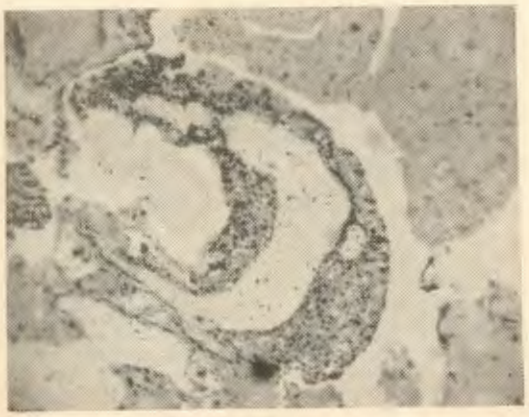

Fig. 3
H & E x 100.
Microphotograph showing early degenerative changes of chorionic villi along with marked proliferation of trophoblastic cells. Syncitial cells show vacuolisation.

Fig. 2
H & E x 100.
Microphotograph showing early hydropic changes in the chorionic villi.

Fig. 4
13-15 autosomal Trisomy (D-Trisomy) Syndrome. The anomalies noted are; wide anterior fontanalle, low-set ears, cleft lip and palate, flexion of fingers and short sternum. Colobona of iris and genital hypoplasia were other abnormalities not seen in this photograph.

Pregnancy Outcome Following Previous Abortion—Chakravarty & Gun pp. 280-288

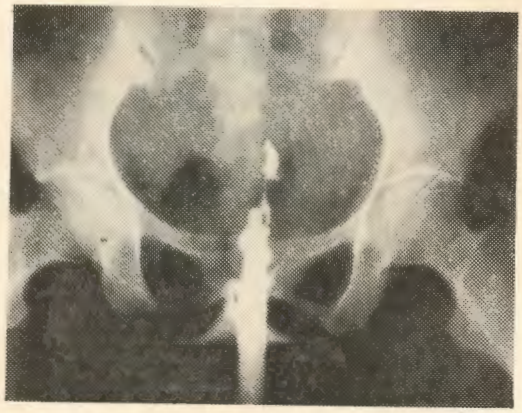

Fig. 5
H S G showing part of uterine cavity with irregular filling defect in the contrast medium uterine synechia.

Prenatal Sex Determination by Differential Cytoplasmic—Chowdhury et al pp. 339-342

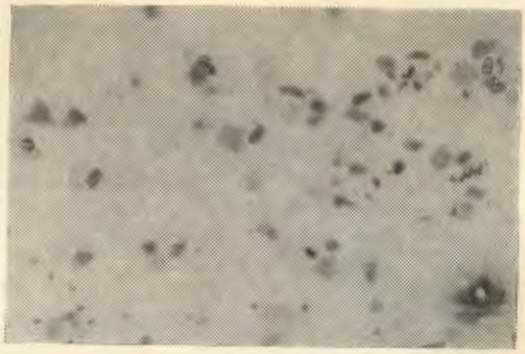

Fig. 2
Photograph showing a high cyanophilic index (56%) in the Amniotic fluid of a female fetus at 34-36 weeks of Gestation (x 50).

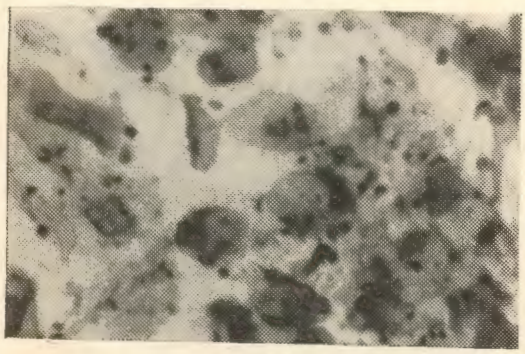

Fig. 3
Photograph showing a low cyanophilic index (21%) in the amniotic fluid of a male fetus at 34-36 weeks of gestation (x 200).

Endometriosis of the Abdominal Scar—Sinha & Sinha pp. 457-469

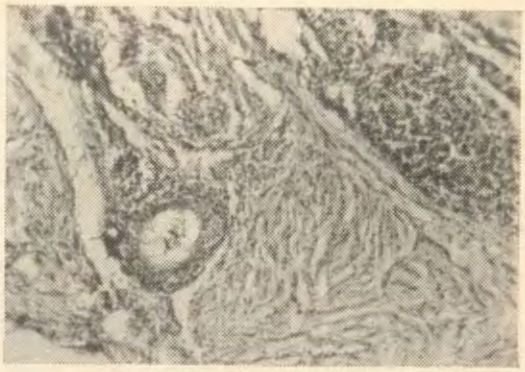

Fig. 1
The section shows several inlet of endometrial tissue in the subcutaneous region.

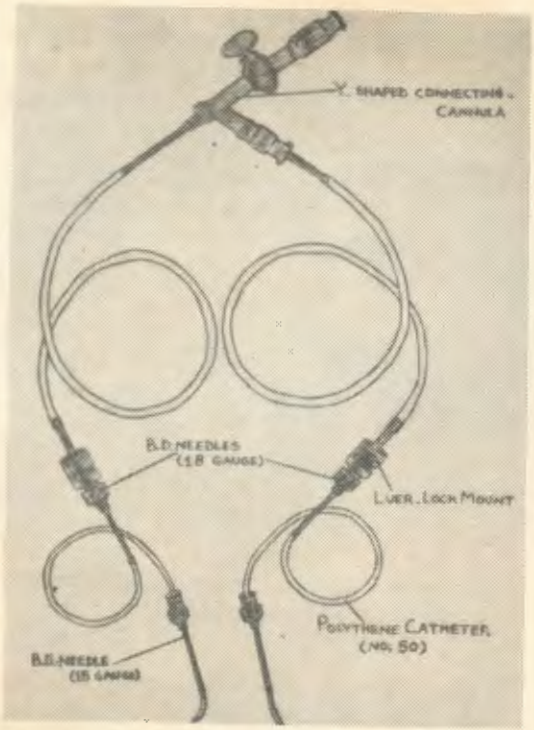

Fig. 1
Showing the Y shaped cannula attached with polythene tubes and needles.

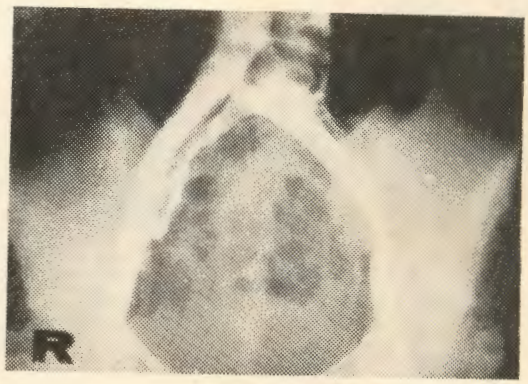

Fig. 2
Pelvic phlebogram showing indentation on the right external iliac view.

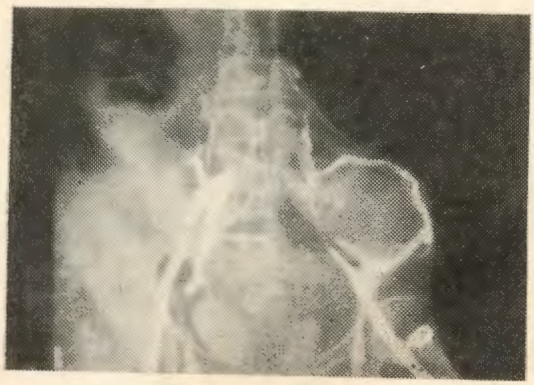

Fig. 3
Pelvic phlebogram showing displacement of the left external iliac vein.

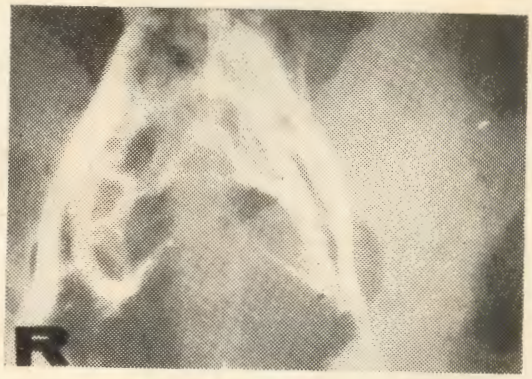

Fig. 4
Pelvic phlebogram showing partial obstruction of right common iliac vein and small collateral vessel formation.

Pelvic Phlebography in Female Genital Cancer—Jaiswal et al pp. 389-393

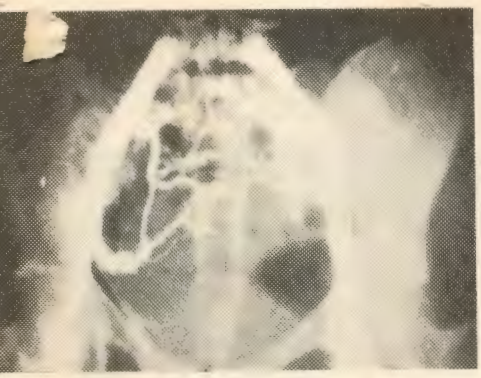

Fig. 5
elvic phlebogram showing multiple collateral vessel formation.

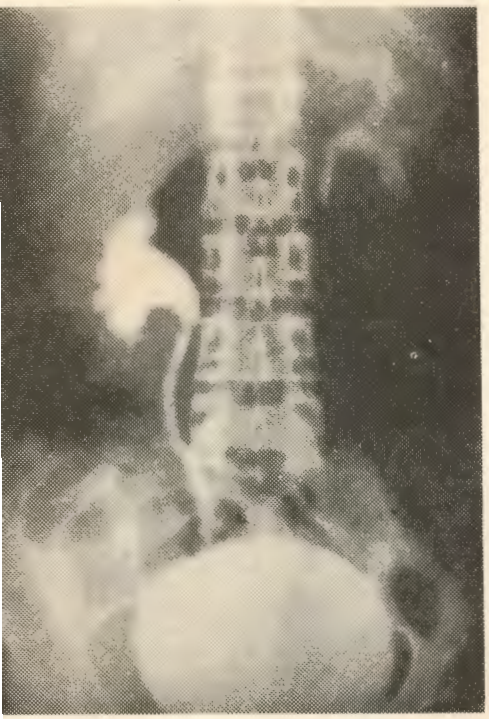

Fig. 6
velogram showing hydromephrotic changes in right kidney.

Histopathology Study of Endometrium in Infertile Women—Abbasi et al pp. 378-382

Fig. 1
Irregular small subnuclear vacuoles with irregular arrangement of nuclei producing pseudostratification of the epithelium. H. & E. x 400.

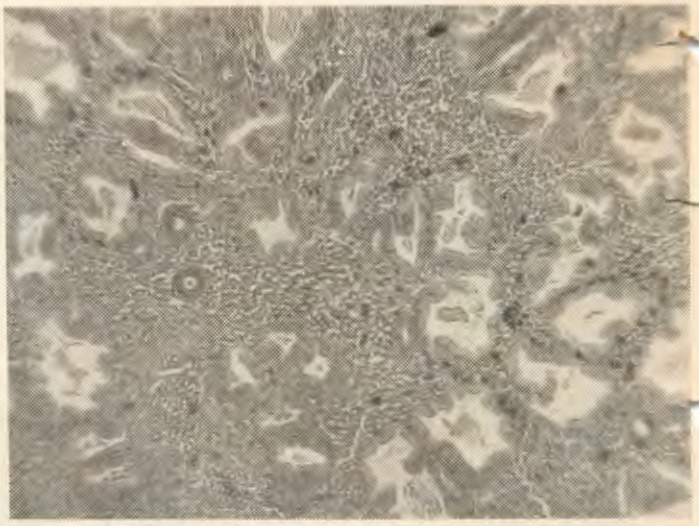

Fig. 2
Most of the glands are in secretory phase, however, a few glands in proliferative phase are seen. H. & E. x 50.

Thoracopagus Tetrabrachius Tetrapus—Pal et al pp. 454-456

Fig. 1
The general form and contour of the monster. The twin on the right side was first delivered.

Fig. 2
Skiagram of the conjoined twin showing relationship of the skeletal structures. The first twin shows marked anteroflextion deformity of lumbar spine.

Absolute Short Umbilical Cord—Pal & Bhattacharya pp. 442-444

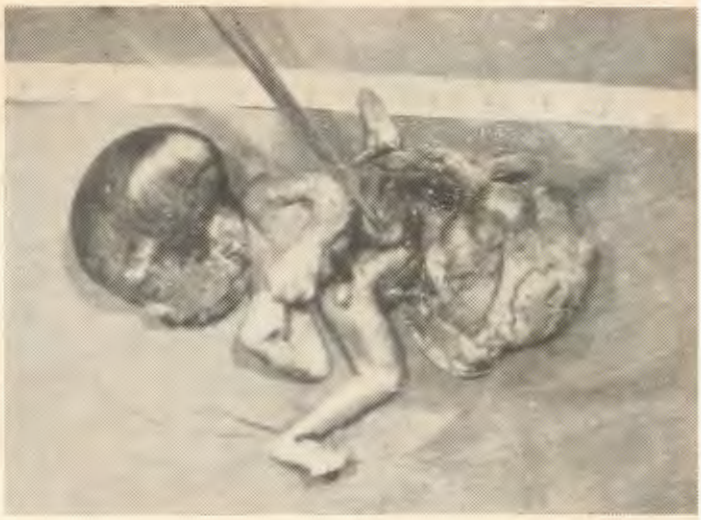

Fig. 1
The artery forceps points to the umbilical cord.

Fig. 2
The deformities of the limbs are well illustrated. There is marked kypho-scoliosis.

Myxoedema and Succesful Pregnancy—Chatterjee & Chaudhury pp. 430-432

Fig. 1
Thyroid scintiscan showing a small sized atrophic thyroid gland with patchy uptake of I^{131}.

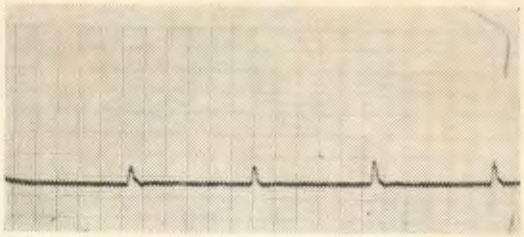

Fig. 2
Photomotograph tracing showing lost ankle jerks for which Achilles reflex time could not be recorded.

Actinomycosis of Ovary—Chema et al pp. 460-461

Fig. 1
H. E. x 70. Showing actinomycotic granulomatory cells.

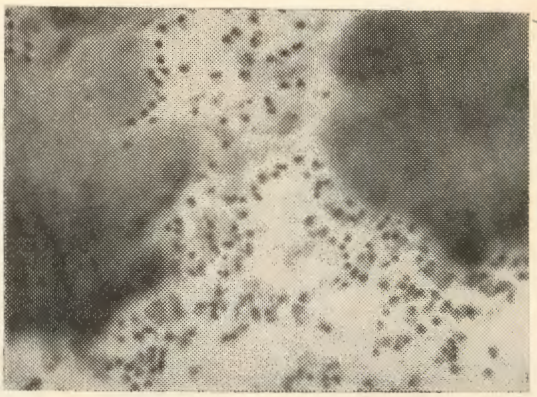

Fig. 2
H. E. x 280. Note the edge of actinomycotic granule showing peripheral mycelia and inflammatory cells.

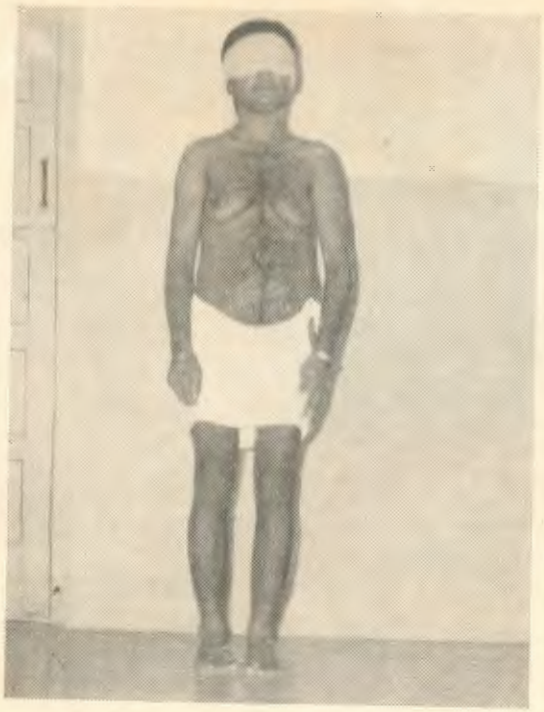

Fig. 1
Preoperative photograph of the patient.

Fig. 2
Photograph showing appearance of external genitalia of the patient.

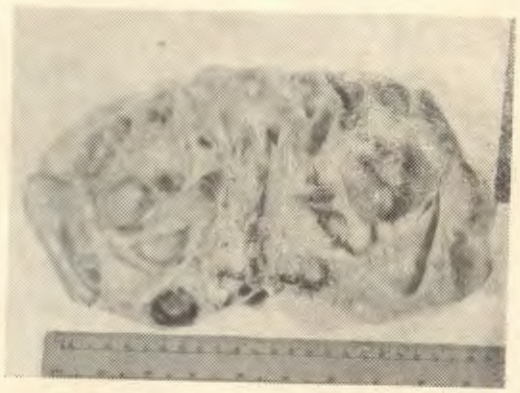

Fig. 3
Photograph showing gross appearance of the bisected tumor.

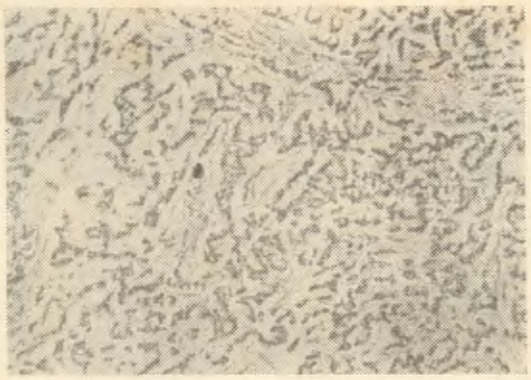

Fig. 4
Photomicrograph of the tumour showing immature Sertoli cells arranged in groups and cords. (H. & E. 100).

Fig. 5
Photomicrograph of the tumor showing area of cystic spaces of various shapes and sizes. H. & E. x 400).

Schalch *et al* 1967; Beck and Daughaday, 1967; Saxena *et al* 1968; Grumbach *et al* 1968; Selenkow *et al* 1971). This difference may be due to the different standard preparations used (Genazzani *et al* 1971).

The value of HPL assay in management of complicated pregnancies is still under dispute (Spellacy *et al* 1970; Genazzani *et al* 1971; Varma *et al* 1971; Letchworth and Chard, 1972; Lindberg and Nilsson, 1973 b). This could be partly due to different methods used and/or an insufficient number of patients investigated (Christensen, 1974).

A correlation has been found between placental weight and HPL concentration during the week before onset of labour (Sayena *et al* 1968, 1969, Seppala and Ruostahti, 1970; Dumont and Thoulon, 1970; Genazzani *et al* 1969); however, Spellacy *et al* (1966) and Samaan *et al* (1971) did not find any correlation.

The present study was carried out to establish normal HPL values during uncomplicated pregnancies. The values obtained in Indian women were similar to those reported for Caucasian women. Work is under progress to determine levels of HPL in complicated pregnancies, and to evaluate the usefulness of HPL assays as an indicator of feto-placental function.

Summary

Levels of human placental lactogen (HPL) in serum of Indian women throughout normal pregnancy were determined using radioimmunoassay. A marked increase in HPL levels were observed around the 12th week of gestation to the 36th week. The HPL levels increased gradually as pregnancy progressed. The HPL concentrations in Indian women were similar to those reported for Western women.

Acknowledgements

The HPL preparation used for the study and the antiserum to HPL were gifts from the NIAMD, Maryland, Bethesda.

References

1. Beck. P. and Daughaday, W. H.: J. Clin. Invest. **46**: 103, 1967.
2. Beck, P., Parker, M. L., Daughaday, W. H.: J. Clin. Endocr. & Metab. **25**: 1457-1462, 1965.
3. Christensen, A.: J. Oslo City Hosp. **87**, 1974.
4. Dumont, M. and Thoulon, J. M.: Proc. of the XXIII Congres de la Federation des societe's de Gynecologie et d'Obstet de langue Francaise, Buxelle, Mason, Im. press. 1970.
5. Frantz, A. G., Rabkin, M. T. and Friesen, H.: J. Clin. Endocr & Metab. **25**: 1136, 1965.
6. Genazzani, A. R., Aubert, M. L., Casoli, M., Fioretti, P. and Felber, J. P.: Lancet. **2**: 1385, 1969.
7. Genazzani, A. R., Cocola, F., Casoli, M., Mello, G., Scarselli, G., Neri, P. and Fioretti, P.: J. Obst. & Gynec. Brit. Cwlth. **78**: 577, 1971.
8. Grumbach, M. M., Kaplan, S. L., Sciarra, J. J. and Burr, I. M.: Ann. N.Y. Acad. Sci. **148**: 501, 1968.
9. Iyengar, L.: J. of Obst. & Gynec. of India. **20**: 196, 1970.
10. Kaplan, S. L. and Grumbach, M. M.: J. Clin. Endocr. & Metab. **25**: 1370, 1965.
11. Letchworth, A. T. and Chard, J.: J. Obst. & Gynec. Brit. Cwlth. **79**: 680, 1972.
12. Lindberg, B. S. and Nilsson, B. A.: J. Obst. & Gynec. Brit. Cwlth. **80**: 619, 1973 b.
13. Midgley, A. R., Jr.: Endocrinol. **79**: 10, 1966.
14. Raghavan, V. P., Rao, Shanta, S., Chaubal, U., Punjabi, J. and Krishna, U.: Ind. J. Med. Res. **61**: 298, 1973.
15. Samaan, N. A., Yen, S. S. C., Friesen, H. and Pearson, O. H.: J. Clin. Endocrinol. & Metab. **26**: 1303, 1966.
16. Samaan, N. A., Gallagher, H. S., McRoberts, W. A. and Paris, A. M.: Am. J. Obst. & Gynec. **109**: 63, 1971.

17. Saxena, B. N., Goldstein, D. P., Emerson, K. and Selenkow, H. A.: Am. J. Obstet. Gyn. 102: 115, 1968.

18. Saxena, B. N., Emerson, K. and Selenkow, H. A.: New Engl. J. Med. 281: 225-231, 1968.

19. Schalch, D. S., Boon, R. C. and Lee, L. A.: Abstr: In Program 49th Ann. Meeting of Endocr. Soc., Bar. Harbour, Florida. p. 61, 1967.

20. Selenkow, H. A., Varma, K., Younger, D., White, P. and Emerson, K., Jr.: Diabetes. 20: 696, 1971.

21. Seppala, M. and Ruoslahti, E.: Acta. Obst. & Gynec. Scand. 49: 143, 1970.

22. Spellacy, W. N., Carlson, K. L. and Birk, S. A.: Am. J. Obst. & Gynec. 96: 1164, 1966.

23. Spellacy, W. N., Teoh, E. S. and Buhi, W. C.: Obst. & Gynec. 35: 685, 1970.

24 Varma, K., Driscolli, S. G., Emerson, K. and Selenkow, H. A.: Obst. & Gynec. 38: 487, 1971.