

Radioimmunoassay was used to determine the levels of estrogens and progesterone in plasma of the following three groups: normal women in luteal phase, normal patients in early pregnancy, and patients whose pregnancy was threatened by abortion terminating both favourably and unfavourably. Cases with uterine pathology or maternal medical diseases were excluded. The data may be summarized as follows: the steroids examined (estrone, estradiol, estriol and progesterone) increase gradually in normal pregnancy. There is evidence of the beginning of placental steroidogenesis. In those pregnancies in which there was a risk of abortion that terminated favourably, the levels of estrogen (and notably estradiol-17 $\beta$ ) remained normal, however this was not the case for those pregnancies resulting in abortion. It is therefore concluded that monitoring the levels of estrogens in plasma in early pregnancy has a prognostic value, whereas progesterone levels have less significance.

**58. The early increase of plasma unconjugated estriol in pregnancy. Significance and clinical usefulness.** R. DE HERTOGH, K. THOMAS and I. VANDERHEYDEN, Endocrinology and Nutrition Unit, University of Louvain, Hôpital Saint-Pierre, Leuven, Belgium

In early pregnancy, the production of estrogens results from the sequential activity of three endocrine tissues: corpus luteum, placenta and fetal adrenals. The latter produce dehydroepiandrosterone sulfate, which is hydroxylated in position 16 in the fetal liver and aromatized into estriol in the placenta.

The increase of estriol in mother's plasma could then mirror the start of this important fetal function. Plasma samples were obtained from pregnant women from the fifth week of pregnancy onwards and unconjugated estriol was extracted with diaethylether, separated from other estrogens on Sephadex LH<sub>20</sub> column chromatography, and measured with a specific radioimmunoassay.

Plasma levels of unconjugated estriol remained below 100 pg/ml up to the ninth week of pregnancy in all cases. By the 10th week, a rapid increase took place which became steeper after the 12th week. The shape of the estriol increase and the mean levels were the same in normal and diabetic pregnancies. This steep increase was due to the activity of the fetal adrenals, as shown by the increase of the E<sub>3</sub>/E<sub>2</sub> ratio in normal pregnancies, and by the low estriol levels in molar pregnancies.

By pooling the results of normal and diabetic pregnancies, the dispersion of the gestation ages in several ranges of plasma estriol levels were as follows:

Estriol ranges: (pg/ml)	100-150	150-200	200-300	300-400	400-550	550-800
Weeks of pregnancy: (mean $\pm$ s)	10.2 $\pm$ 1.2	11.5 $\pm$ 0.8	12.2 $\pm$ 1.2	13.7 $\pm$ 1.0	13.8 $\pm$ 0.9	15 $\pm$ 1.0
n	21	17	17	15	18	18

It is felt that repeated measurements of unconjugated plasma estriol in early pregnancy (between the 10th and 16th week) can contribute to determine the gestational age, particularly in diabetic pregnancies in which fetal maturity has to be carefully taken into account.

**59. Pregnancies with low estriol production.** PREBEN GAEDE and J. G. KLEBE, Departments of Obstetrics and Gynecology, Rigshospitalet and Oresundshospitalet, Copenhagen, Denmark

Estimations of estriol in blood and urine have for a long time been used as the best hormone parameter for foetal well-being. Nevertheless both placenta and foetus are involved in the production of the hormone. While a

specific foetal hormone is still missing, both placenta lactogenic hormone (HPL) and chorionadotropin (HCG) are specific placenta hormones of great clinical value in cases of placental insufficiency.

Low estriol values in blood or urine are in most cases caused by abnormalities in the foeto-placental unit. Besides placental insufficiency several other reasons are possible such as enzyme defects in placenta (sulfatase defect), anencephali or foetal death, or medical treatment of the mother with drugs (fluorsubstituted corticosteroids or antibiotics).

In patients with low estriol values a placental functional test can make a differentiation between foetal and placental defects possible in a more detailed way than estimations of HPL. Infusion of dehydroepiandrosterone (DHA) and/or its sulfate ester (DHAS) to patients with low estriol production allow us to investigate both the aromatizing enzyme system in the placenta and the placental sulfatase activity by measuring the serum estradiol concentration. It is the same enzyme systems which are involved in the conversion of 16 $\alpha$ -hydroxy-DHAS to estriol in the foeto-placental unit, and the paper deals with examples where the DHA/DHAS test has been of great clinical help.

**60. Plasma progesterone and estriol determinations in normal and high-risk pregnancies.** E. R. JAEGER-WHITEGIVER, E. FRIEDRICH, B. FAUSER, P. NOTTEBAUM and A. E. SCHINDLER, Universitätsfrauenklinik, Tübingen, Germany

The measurement of estriol (E<sub>3</sub>) in plasma or urine is used to monitor fetal-placental function in high-risk pregnancies. Data in the literature indicate that in pregnancies complicated by Rh-incompatibility, the quantitation of this steroid does not directly reflect the severity of fetal jeopardy caused by Rh-incompatibility. Therefore, specific radioimmunoassays for plasma E<sub>3</sub> and progesterone (P) were used to reevaluate the effects on the hormone patterns found in Rh-incompatibility and other pathological conditions. Plasma P and E<sub>3</sub> were measured following other extraction and a Sephadex LH-20 chromatographic step by using specific antisera. P and E<sub>3</sub> ranges for uncomplicated pregnancies were calculated from 300 samples taken at various weeks of gestation from a total of 275 women. Values were measured from 3 normal twin pregnancies. Single determinations were made from 54 plasma samples taken randomly throughout gestation from 49 women with complicated pregnancies (e.g., diabetes, pre-eclampsia, anencephaly, pre- and postmaturity) and serial determinations were made from 9 women with pregnancies complicated by Rh-incompatibility. The mean E<sub>3</sub> values for normal pregnancies range from 0.38 ng/ml plasma  $\pm$  0.38 S.D. (n = 5) in the eighth week to 13.77 ng/ml  $\pm$  3.16 S.D. (n = 8) in the 40th week. The normal P values range from 20.86 ng/ml  $\pm$  10.49 S.D. (n = 5) in the eighth week to 136.97 ng/ml  $\pm$  33.4 S.D. (n = 8) in the 40th week. Even in severe cases of Rh-incompatibility, normal to high E<sub>3</sub> and P values were found, confirming previous results. Only shortly prior to intrauterine death, a rapid fall of plasma E<sub>3</sub> and P concentrations occurred.

**61. Hormonal pattern of threatened abortion.** J. GERGELY, J. VAN PEBORGH, M. L'HERMITE-BALERIAUX and R. HECHTERMANS, Department of Obstetrics and Gynaecology (Fr. R. Vokaer), Brugmann University Hospital, Free University of Brussels, Belgium

Sixty cases of threatened abortions were studied, from