

in class B, who were treated with insulin. From mid to late pregnancy, CPR values during OGTT were significantly elevated, while IRI were slightly. At 1 week after delivery, both IRI and CPR were particularly decreased. From 1 week to 4 weeks, only IRI were slightly but significantly elevated. In diabetics, fasting values of IRG were higher in postpartum, but the degrees of these elevations were smaller as compared to normal during pregnancy. Following arginine infusion, IRI and IRG responses were not elevated during pregnancy.

From the results mentioned above, it is considered that alpha and beta cell of pancreas are loaded during pregnancy, but in diabetics tend to decrease the responsiveness to various stimuli. During pregnancy, metabolic clearance of insulin in liver are also influenced and there are some differences of effects between glucose and arginine.

## 212. Glucose Tolerance Test (GTT) and Serum C-peptide Immunoreactivity (CPR) in Pregnant Women

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CPR is one of the useful indicators of the function of pancreatic  $\beta$ -cells in diabetic patients who are treated with insulin, because insulin antibody interferes with the measurement of endogenous insulin.

Oral glucose tolerance test (50 g. glucose) and measurement of serum CPR were carried out simultaneously in such cases as below at four points (fasting, at 30, 60, 120 min.). The relationship between blood sugar (BS) and CPR was investigated ( $\Delta$ CPR/ $\Delta$ BS). 115 cases studied from April to August in 1977 were pregnant women with glycosuria, ones of family history of diabetes mellitus, ones who delivered large babies more than four kilograms all cases exclusive of patients in insulin therapy and control group.

Results: In all cases totally, CPR tends to reach its peak at 60 min. in normal (N) type of GTT, at 60 or 120 min. in border line (B) type and at 120 min. in diabetic (D) type, respectively.

$\Delta$ CPR/ $\Delta$ BS (30 min.) values were calculated. (mean  $\pm$  S.D.)

### 1. Group of glycosuria.

The value was  $0.089 \pm 0.034$  (n=32) in N type,

$0.087 \pm 0.045$  (n=19) in B type and  $0.022$  (n=2) in D type.

### 2. Group of family history of diabetes mellitus.

The value was  $0.089 \pm 0.027$  (n=9) in N type,  $0.070 \pm 0.033$  (n=13) in B type and  $0.038 \pm 0.015$  (n=4) in D type.

### 3. Control group.

The value was  $0.102 \pm 0.030$  (n=7) in N type,  $0.053 \pm 0.019$  (n=9) in B type and  $0.039 \pm 0.018$  (n=5) in D type.

## 213. Studies on the Binding of hCS, GH, PRL (GH-PRL Superfamily) and Insulin in Fetal and Maternal Liver, and Placenta

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hCS, GH, PRL (GH-PRL superfamily) and Insulin play an important role on glucose metabolism during pregnancy. The amounts of specific binding of  $^{125}$ I labeled hormones ( $^{125}$ I-hCS,  $^{125}$ I-Insulin) to plasma membrane were measured in fetal and maternal liver and placenta. The results were as follows:

I. GH-PRL superfamily: Binding of hCS was very low in fetus and placenta. Binding increased in nonpregnant adult female, reaching more than 300% of control levels in late pregnancy.

II. Insulin: Binding of Insulin was recognized in fetus and placenta. Although binding of Insulin slightly decreased in late pregnancy, there was no significant change throughout pregnancy.

To study the effect of steroid hormones, estrogen, progesterone and glucocorticoid were injected to nonpregnant female rats. The increase of binding of hCS was seen in only estrogen (estradiol) treated rats. But that of Insulin was not affected by these hormones.

The lactogenic hormones measured by hCS-RRA increased with two peaks, at mid-pregnancy and near term in rat. rPRL was very low throughout pregnancy.

In this study, we demonstrated 2 distinct systems in pregnant rats, such as anabolism (fetus) and catabolism (mother). And the regulation of superfamily receptor might be due to estrogen or lactogenic hormones.