liver, intestine, skin, kidney, lung and pancreas. Among these tissues, the highest 17α-hydroxylase activity was found in the ovaries, but 20-keto reductase and 5-ene-3-HSD were distributed to some other tissues, too.

The fetal ovary possesses the enzyme activities which is necessary to form sex steroid hormones, although their potency was relatively low. The significance of these enzymes in fetal life must await further study.

175. Immunoreactive Somatostatin (GIF) in Human Fetal Tissue

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The capacity of the fetal pituitary gland to synthesize and secrete growth hormone (GH) is established early gestation (Kaplan et al. 1972). Incremental change in the content and concentration of pituitary GH occurs throughout gestation. It has been proposed that the pattern of GH secretion in the fetus may reflect maturational change in secretion of hypothalamic GRF and GIF. Since Arimura et al. (1975) reported the radioimmunoassay (RIA) for somatostatin (GIF), it has been dimonstrated that GIF is widely distributed throughout the central nervous system and in the pancreas and stomach. We also developed a specific RIA for GIF. The minimum detectable dose of GIF was 3 pg/ml and with this assay system, we measured the concentration of GIF in the various organ of human fetus from 13 to 32 weeks gestational age. The immunoreactive GIF (IR-GIF) was extracted from fetal hypothalamus, pituitary, cerebrum, pancreas, stomach, intistine, kideny, liver, adrenal, and thyroid with 2 N acetic acid. The recovery rate of this extraction was about 72% and the degradation of GIF in tissue at 4°C and 37°C in vitro after 120 min. were 10 and 20% respectively. The dose reponse curve of the extracted IR-GIF were parallered with the standard curve of synthetic somatostatin. For example, by 17 weeks in the fetus tested, the concentration of IR-GIF were 3.7 ng/0.1 g of mean value in hypothalamus, 2.3 ng/0.1 g in pituitary, 0.2 ng/0.1 g in cerebrum, 3.2 ng/0.1 g in pancreas, 0.9 ng/0.1 g in stomach, and 0.5 ng/0.1 g in intestine. The concentration of IR-GIF in hypothalamus was showed a positive correlation with gestational age from 13 to 24 weeks.

176. A Course of Adaptation to Extrauterine Environment and Reverse T_3 (rT_3)

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To Study the behavior of the thyroid function of a fetus in the perinatal hypoxic condition, we measured rT_3, T_3 and T_4 in fetal and newborn serum.

Cord rT_3, rT_3/T_3 and rT_3/T_4 values during forceps-delivery showed significantly higher than other modes of delivery.

Values of hormones in cord blood in cases of fetal distress with neonatal asphyxia were similar to those of normal cases of which the Apgar score was improved rapidly.

However, serum rT_3 in the cord and the newborn remained high and showed a tendency of high value along with rT_3/T_3 and rT_3/T_4 in cases in which the newborn showed no improvement in the Apgar score and developed into respiratory distress and died within 48 hours after birth.

In an experiment with Wistar rat under 5% oxygen environment, the same tendency was observed, although there was no statistically significant difference in values of hormones in two hours after the experiment was performed.

From the findings above, it was surmised that the thyroid function of fetuses would probably respond to factors related to perinatal hypoxia.

177. Protein and Lipid Metabolism in the Liver Cell during Development

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The respiratory control ratio and oxidative phosphorylation in fetal mitochondria are much lower than that of adult. They depend on their protein and lipid structural changes during development. Lipid and protein are synthesized in