319 UMBILICAL SERUM CORTISOL (F), DEHYDROEPIANDROSTERONE SULFATE (DHAS) AND TOTAL ESTRIOL (E_3) LEVELS IN PRE_MATURE AND FULL TERM INFANTS. Akihiko Noguchi, Marvin R. Turnipseed, Karen Bentley and John W. Reynolds. University of Minnesota Medical School, Department of Pediatrics.

Neonatal interrelationships of F, DHAS and E_3 in cord blood in reference to gestational age and mode of delivery were examined. Cord serum steriods were determined by radioimmunoassay in 275 vaginally delivered infants (30-42 wks gestation) and 20 C-section infants (36-42 wks). In the vaginally born group mean E_3 1832±744 (SD) ng/ml of 36-42 wks infants was higher than 1276±460 of 30-35 wks infants. (t, $p<0.005$). The corresponding DHAS levels were 2301±737ng/ml and 2216±781 respectively ($p>.05$); F levels were 153±67ng/ml and 123±55 respectively ($p>.05$). F and DHAS levels were higher in vaginally born than C-section infants, ($p<0.005$), but not for E_3. In each group, F, DHAS and E_3 levels were similar regardless of spontaneous onset or absence of labor. Thus, after 35 wks gestation, fetal serum estriol levels increase without corresponding increase in DHAS; fetal cortisol and DHAS are increased with vaginal delivery. We speculate that after 35 wks the fetal adrenal gland increases its production of DHAS which is efficiently coverted to estriol by the placenta; the acute stress of vaginal delivery increases fetal cortisol as well as DHAS production.

320 EFFECT OF IN-UTERO INTRAVENOUS ADMINISTRATION OF THYROXINE AND OTHER HORMONES ON LUNG FLUID LECITHIN SPHINGOMYELIN (L/S) RATIO OF THE FETAL LAMB. Uchenna C. Nwosu, James D. Ferguson, Edward E. Wallach, Alfred M. Bongiovanni and Maria Delivoria-Papadopoulos. Univ. of Pennsylvania Sch. of Med., Dept. of Ped., and Pennsylvania Hosp., Dept. of Ob-Gyn. Philadelphia, Pa.

Glucocorticoid hormones influence lung maturation, but their effect on the L/S ratio has not been clearly demonstrated. Prior to lung maturity 9 fetal lambs (mean 118 days) were chronically catheterized in-utero. Fetal lung fluid was diverted into an external drainage bag by a Foley catheter through a tracheotomy. A single dose of Cortisol 2.5-5.0 mg., Dexamethasone 200/ng, T4 500/ng, or T3 1-150/ng was administered via the jugular catheter for 3 days during the first treatment period beginning 3-12 days after surgery. An identical course of treatment was repeated 10 days later. Fetal blood pH and plasma level of the administered hormone were monitored daily. The L/S profile for each fetal lamb was compared to a mean curve derived from 7 control fetal lambs receiving saline solution at comparable periods. No change in the lung fluid L/S pattern was found after repeated administration of Cortisol or Dexamethasone in 3 fetal lambs. A sharp increase in the ratio was seen after 2 courses of T4 treatment in 2 fetal lambs while T4 treatment during the second period alone failed to produce this effect. Administration of 1-10/ng of T3 during the second period alone produced no change in the L/S ratio in the 3 remaining lambs. These preliminary data suggest that pharmacological doses of T4 can alter the lung fluid L/S ratio in fetuses previously primed with that hormone.

321 PRENATAL SURGE OF PLASMA T3 IN THE FETAL LAMB. Uchenna C. Nwosu, Michael M. Kaplan, Endla K. Anday, and Maria Delivoria-Papadopoulos. Univ. of Pennsylvania Sch. of Med., Depts. of Med. and Ped., and Pennsylvania Hosp., Dept. of Ob-Gyn. Philadelphia, Pa.

Prenatal changes in iodothyronine levels with respect to parturition have not been clearly established. The present studies investigate the changes of fetal serum iodothyronine concentration preceeding labor. Seven fetal lambs 113-135 days gestation were chronically catheterized in-utero from early 3rd trimester to delivery. Daily plasma concentrations of Cortisol, T4, T3, and rT3 were measured. Simultaneous maternal blood samples were similarly analyzed. Mean fetal plasma T3 rose from a baseline of 30 ng/dl to 150 ng/dl one day prior to delivery with most of the increase occurring during the 4 days prior to labor. Fetal plasma Cortisol was found to increase in phase with T3. Mean Cortisol rose in the 4 days prior to labor from a baseline of 1 ng/dl to 8 ng/dl and sharply increased 1 day prior to delivery. Mean values for fetal plasma T4 and rT3 were 12 ng/dl and 450 ng/dl respectively, and although no significant changes occurred, a tendency to decrease was evident during the 10 days prior to delivery. Fetal and maternal hormone levels were independent at all times. Baseline maternal T3 and Cortisol were 2 times higher than fetal levels until the 4 days prior to delivery when fetal levels rose to 4 and 2 times the maternal levels respectively. Mean maternal T4 and rT3 levels remained ½ and ¼ of the mean fetal values. The abrupt increase in fetal T3 without a corresponding change in T4 suggests the basic alteration is in extrathyroidal T4 to T3 conversion, not in increased TSH secretion.

322 USEFULNESS OF PLASMA ANDROGEN CONCENTRATIONS FOR THE DIAGNOSIS OF VIRILIZING CONGENITAL ADRENAL HYPERPLASIA (VCAH) IN NEONATES AND YOUNG INFANTS. S. Pang, L. S. Levine D. M. Chow and M. I. New, Cornell Univ. Med. Col., New York

Plasma androgen concentrations, androstenedione, dehydroepiandrosterone (DHEA), testosterone (T) were measured in cord blood and from birth to 1 year-of-age in normal infants and in 4 male and 4 female infants ultimately proven to have VCAH. Cord blood androgen concentrations in two affected males did not differ from those of normal newborns (12 female, 16 males). Androstenedione in all affected infants was highly elevated while DHEA was elevated in only 3 infants. T was clearly elevated in all affected females. However, since the normal newborn male has high T concentrations (25-428), T concentrations in male infants with VCAH (60-295) were indistinguishable from normal. T in these infants decreased with glucocorticoid administration (blank-11) suggesting that the T was adrenal in origin and that testicular testosterone was suppressed in the untreated state. Conclusions: 1) cord blood androgen concentrations may not be diagnostic for VCAH; 2) plasma androstenedione is clearly a diagnostic hormone for VCAH in both sexes while T is useful only in female infants; and 3) the evidence of suppressed Leydig cell function in affected males suggests presence of negative feedback of the gonadstat in young male infants by excess adrenal steroids.

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Abstract withdrawn

324 TRI-IODOTHYRONINE (T_3) ELEVATION DUE TO DESICCATED THYROID. Robert Penny and S. Douglas Frasier. University of Southern California School of Medicine, and Los Angeles County-USC Medical Center, Department of Pediatrics, Los Angeles, California.

Fourteen hypothyroid children, 10 girls and 4 boys, had serum T_4, T_3 and TSH measured while receiving replacement therapy with desiccated thyroid and 6 weeks after beginning replacement therapy with sodium-ℓ-thyroxine, 4.2±0.6(SD) µg/Kg per day (maximum 200 µg). Serum T_3 while receiving desiccated thyroid was 393±144(SD) ng/dl compared to 157±23(SD) ng/dl while receiving thyroxine ($P<0.01$). Serum T_3 exceeded 220 ng/dl in 13 patients on desiccated thyroid. All serum T_3 concentrations were within the normal range on thyroxine. Therapy with both thyroid and thyroxine resulted in normal T_4 and TSH concentrations. However, the mean T_4 concentration on desiccated thyroid was 7.4±2.0(SD) µg/dl compared to 11.7±2.5(SD) µg/dl while receiving thyroxine ($P<0.01$). Mean TSH concentration was 1.3±1.2(SD) µU/ml on thyroid and 1.6±1.1(SD) µU/ml on thyroxine ($P>0.1$). Our findings show that a paradoxically elevated serum T_3 concentration, unassociated with clinical hyperthyroidism is, in general, characteristic of treatment with desiccated thyroid. Replacement with sodium-ℓ-thyroxine leads to normalization of all routine tests of thyroid function.