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SERUM THYROID STIMULATING HORMONE (TSH), THYROXINE (T_4) AND TRIIODOTHYRONINE (T_3) LEVELS IN THE PRE-TERM INFANT. Allen Erenberg, Mary M. Weinstein and Richard M. Cowett (Spon. by William Oh). U. of Iowa Coll. Med., Dept. Ped., Iowa City and Brown U., Women & Infant's Hosp., Prov. R.I.

To determine if inclusion of the healthy pre-term infant in mass neonatal screening programs would increase the number of false-positive results, the changes in serum TSH, T_4 and T_3 levels were studied in healthy infants between 30 and 35, Group (G) I, and 36 to 38, G II, weeks gestation during the 1st 72 hours (h) of age. (Value = Mean ± SEM)

		Cord	.5-4h	12-24h	36-48h	60-72h
TSH	GI	9.7±1.4	43.8±21.4	16.6±2.9	13.9±2.3	12.6±3.5
μU/ml	GII	13.0±3.3	30.9±10.9	6.7±1.4	4.4±1.0	4.1±1.1
T_4	GI	11.6±1.2	15.6± 0.9	15.0±2.0	15.3±1.8	14.7±1.3
μg/dl	GII	11.4±1.2	12.7± 1.9	17.4±1.7	16.4±1.8	15.8±1.2
T_3	GI	49.3±8.3		82.7±11.1	88.7±5.6	67.7±6.5
ng/dl	GII	47.0±9.0		162.3±42.9	146.6±25.1	106.2±17.8

In both G there was a rise in the mean serum TSH level at .5 to 4 h after birth. Mean T_4 and T_3 levels increased by 24 h and remained unchanged until 72 h of age, although the rise in mean T_3 level was less in the younger gestational age infant. Conclusions: 1) In the healthy pre-term neonate, the rise in serum TSH level at .5 to 4 h of age is followed by a rise in serum T_4 and T_3 levels by 24 h. 2) Screening of healthy pre-term infants from 30 to 38 weeks gestation for congenital hypothyroidism by serum T_4 or TSH levels at 24 to 72 h will most likely not increase the number of false-positive results.

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DIABETES MELLITUS (DM),HASHIMOTO'S THYROIDITIS (HT) AND JUVENILE RHEUMATOID ARTHRITIS (JRA) IN A 14-YEAR-OLD GIRL.Martin M. Fisher and Cyril A.L. Abrams (spon by Arturo Aballi).School of Medicine,Health Sciences Center,SUNY at Stony Brook, and Long Island Jewish-Hillside Medical Center,Department of Pediatrics,New Hyde Park,New York.

The association of DM,HT and JRA has not been previously recorded.The purpose of this communication is to report our preliminary findings in a 14 year old Haitian girl who developed insulin- dependent DM at age 6 yrs, goiter at 9 yrs, and polyarticular JRA at 12 yrs.No evidence of iridocyclitis was present.Following thyroid and gold therapy the goiter regressed and the arthritis improved.There was a family history of DM and goiter in the mother and of DM in maternal relatives.Investigations revealed normal T4;antimicrosomal thyroid antibodies (1:25,000 and 1:7,000);antinuclear antibodies (1:32,768 and 1:1,024);rheumatoid factor (1:320 and 1:640);high-normal C3 (240mg%) and elevated C4 (240mg%);normal IgA and IgM,elevated IgG;elevated gamma globulin; normal CBC peripheral smear and serum B12;normal adrenal response to ACTH stimulation;HL-A,A-28,A-9,B-27,B-7,CW-2;elevated ESR (33 and 26 mm/hr); and evidence of JRA on wrist x-ray.These findings are consistent with the presence of an autoimmune disorder. Furthermore,their association with DM in this patient lends support to the concept that DM may itself be a disease of autoimmune origin.We believe this to be the first report of the coexistence and concurrent expression of DM, HT and JRA in one individual.

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CONTINUOUS MONITORING OF BLOOD GLUCOSE DURING ARGININE-INSULIN GROWTH HORMONE (GH) STIMULATION TEST. Angeliki Georgopoulos, Maria I. Schmidt, Leslie P. Plotnick, Peter A. Lee, Claude J. Migeon and A. Avinoam Kowarski. The Johns Hopkins University School of Medicine, Department of Pediatrics, Baltimore, Maryland 21205.

A newly developed continuous glucose monitor (CGM) incorporates a non-thrombogenic blood withdrawal system and a glucose electrode which generates a continuous tracing of real blood glucose (BG) during an Arginine-Insulin GH Stimulation Test (AIST) which was administered to seven children with short stature.

The intravenous infusion of arginine was associated with an increase of BG from a baseline of 83 ± 10.9 to 107.7 ± 14.9 (mg/100 ml ± 1 SD). The peak level was reached 26.3 ± 6.5 minutes, and returned to baseline 51.3 ± 9.5 minutes, after the IV injection.

The nadir in BG occurred 30.4 ± 8.5 minutes after IV insulin. The baseline level of 76.6 ± 10.1 mg/100 ml ± 1 SD fell to 29.1 ± 6.2. The BG returned to normal 57.2 ± 7.5 minutes after the IV injection.

Symptoms of hypoglycemia may force premature termination of the AIST. In two of the patients the AIST was continued despite symptoms because the BG level was increasing at the time. The use of CGM increases the safety of the AIST by providing real time level of BG.

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METABOLIC CLEARANCE RATE OF OXYTOCIN IN MATERNAL AND FETAL SHEEP. T.H. Glatz, R.E. Weitzman, P.W. Nathanielsz, and D.A. Fisher. Fetal-Maternal Research Laboratories, UCLA-Harbor General Hospital, Torrance, CA.

Simultaneous maternal and fetal plasma oxytocin (OXY) concn. (μU/ml) were measured by radioimmunoassay before and during continuous infusion of synthetic OXY to steady state conditions into ewe or fetus (gestational age 124-140 days; at least 5 days post-surgery; estimated fetal wt. 3 kg).

Infusion Rate:	Fetal OXY Infusion Fetal(N=5)	Maternal(N=4)	Maternal OXY Infusion Maternal(N=4)	Fetal(N=3)
Baseline	1.4±0.2 (S.E)	0.7±0.1	1.1±0.3	2.1±0.5
80 μU/kg/min	4.8±0.3	1.1±0.3	6.8±1.2	1.9±0.7
800 μU/kg/min	41.8±4.6	0.9±0.2	47.3±6.4	2.0±0.8

Fetal metabolic clearance rates (MCR in ml/kg/min) were calculated to be 18.1 ± 1.1 and 15.0 ± 1.3 at the two infusion rates; maternal MCR were 12.7 ± 2.8 and 13.4 ± 2.3, respectively. Examination of simultaneous fetal and maternal baseline OXY concentrations revealed that fetal levels were significantly higher than maternal: 1.9 ± 0.2 vs 0.7 ± 0.1 ($p<.05$). Continuous monitoring of uterine pressure revealed that uterine contractions were induced by maternal infusion of 800 μU/kg/min; no uterine contractions were induced by fetal infusion. Conclusions based on these data are: 1) plasma OXY levels exceed maternal levels in fetuses of 124-140 days gestation; 2) transplacental passage of OXY is minimal in both M-F and F-M directions; 3) maternal and fetal MCR of OXY are similar and unrelated to plasma OXY levels.

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A NEW SYNDROME OF SHORT STATURE DUE TO BIOLOGICALLY INACTIVE BUT IMMUNOREACTIVE GROWTH HORMONE, Alberto Hayek, Glenn T. Peake and Robert E. Greenberg, Depts. of Peds. and Med., Univ. of New Mexico School of Med., Albuquerque, New Mexico.

A 25 month old girl was first seen because of growth deceleration beginning at 3 months of age. Birth weight was 6½ lbs. and length 19". P. examination was normal except for a height-age of 13 months. After estrogen priming a growth hormone (GH) stimulation test following sequential L-Dopa, arginine and glucagon peaked at 124 ng/ml from a base-line of 63 ng/ml. Serum somatomedin-C (Sm-C) concentration, both basal and post-stimulation, measured 0.24 U/ml. (Nl. 1.5±0.5 U/ml. Measured by Dr. L. Underwood, Univ. of North Carolina, Chapel Hill). At the end of a 24 hour fast her blood glucose was 68 mg%. GH was given for 6 days and her Sm-C level increased to 0.43 U/ml. Four months later her metabolic response to the administration of GH for 6 days showed: release of FFA from 757 to 1341 μM/l and no increase in urinary Ca++. Again her Sm-C increased from 0.19 to a peak of .73 U/ml. Prior to GH, her basal GH levels ranged from 8 to 14 ng/ml. By RIA her GH produced a parallel dose-response to pituitary GH standard. After the above study, the patient was discharged on GH, 0.1 U/kg three times a week. In the last 2 months her growth rate has increased from 0.5 to 1/cm/month. The data on this patient appear to rule out a defect in Sm-C synthesis or function, as well as factors, either inhibiting GH action or receptor function. The growth deceleration could be explained on the basis of an abnormal circulating GH molecule.

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TRANSPLACENTAL TRANSFER, METABOLISM & PHARMACOKINETICS OF DIETHYLSTILBESTROL(DES) AND ESTRADIOL 17β(E_2) IN PREGNANT RHESUS MONKEYS. D.E. Hill, E.D. Helton, G. W. Lipe, G.D.Newport, T.J.Sziszak, J.R. Bailey and J.F.Young(Spon. by R.H. Fiser). Dept. of Ped., Univ. of Ark. for Med. Sci.and National Center For Toxicological Research, Little Rock and Jefferson, Arkansas.

Pregnant rhesus monkeys(120-145 days) were anesthetized with Ketamine, and a femoral maternal artery catheter and fetal umbilical artery and/or vein were cannulated by an extra-amniotic technique. Either [UL-^{14}C] DES, [monoethyl-1-^{3}H] DES or [6,7,^{3}H] E_2 in 20% ethanol was given in a maternal vein. Blood samples were collected for a 2 hr period. The maternal $T_{\frac{1}{2}}$ for the ^{14}C-DES was 35 min as compared to 100 min for ^{3}H DES. The $T_{\frac{1}{2}}$ for E_2 was 45 min. Both DES and E_2 appeared in the fetal circulation within 5 min and reached a maximum total radioactivity at 40-60 min. Radioactivity accumulated primarily in fetal liver, lung, intestine, uterus and brain of animals dissected immediately after the experiment. Complete analysis was performed on the total fecal and urinary products in one animal. Urinary conjugates were purified by XAD-2 and Sephadex LH-20(MEOH/ETOH 1:1). Three urinary conjugate fractions were obtained, hydrolyzed, and the aglycones identified by GC/MS to be cis/trans DES and possibly dienestrol. The principal fecal product found after extraction and LH-20 purification(benzene/MEOH 80:20) was identified thru GC/MS as DES. The fecal conjugates were chromatographically similar to the urinary conjugates. This is the first non-human primate evidence that DES crosses the placenta and accumulates in the fetus. DES pharmacokinetics and metabolism appear similar to natural estrogens.