147 SKELETAL GROWTH IN HYPERGLYCEMIC FETAL RATS.

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It is unknown why fetal rats of diabetic mothers are smaller than normal. Therefore, pregnant rats were infused i.v. from day 19 to 21 with saline (S) or 40% Glucose (G). Fetal body weight and the thymidine incorporation into fetal a) rib cartilage in vivo and b) isolated chondrocytes in response to normal fetal or maternal rat serum were determined. Bodyweights were lower in G: 4.17 ± 0.17 g, n=18 than in S: 4.32 ± 0.14g, n=24, < 0.05. In S thymidine incorporation in vivo was higher in small compared to big fetuses: r= -0.531, n=55, < 0.001. Opposite results were obtained in group G: r= +0.542, n=54, < 0.001. The results of the thymidine incorporation into isolated chondrocytes are shown in the table (cpm/10^5 cells).

	% serum		
infusion	0	2.5 fetal	2,5 maternal
saline	994 ± 144	8781 ± 1911	2830 ± 899[a]
glucose	801 ± 68	10707 ± 2180[a]	445 ± 193[b]

(M ± SEM; n=12, [a] < 0.05; [b] < 0.001 versus 0% serum)
Chondrocytes of hyperglycemic fetuses did not respond to maternal serum, which suggests that both adult and fetal growth factors are needed for appropriate fetal growth.

148 ENDOCRINE AND METABOLIC REGULATION IN TERM NEONATES (TN) UNDERGOING CARDIAC SURGERY (CS)WITH CARDIO-PULMONARY BYPASS (CPB).

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Stress mediated hormonal changes in adult patients undergoing CS lead to severe post-op catabolism.Neonatal response to CS has not been studied.Stress hormones and metabolic fuels were measured in 5 TN preop,preCPB,endop,6,12,24 hr postop. A significant rise in plasma adrenaline,noradrenaline,cortisol,11-deoxycortisol and corticosterone occurred during CS and postop.Plasma aldosterone and insulin levels did not change.Blood levels of glucose,lactate and pyruvate increased markedly whereas ketone body levels were lowered during and after CS. Marked endocrine-metabolic alterations were associated with poor clinical condition.Prevention of a catabolic stress reaction by anaesthetic/hormonal manipulation in vulnerable TN undergoing CS and CPB may improve postop outcome

(Median values)	Preop	PreCPB	Endop	6 hr	12 hr	24 hr
Cortisol nmol/L	356	648*	436	781*	643*	149
11Deoxycortisol	0.55	1.07	0.92	0.92*	0.17	0.23
Aldosterone	4.44	5.82	3.41	2.64	6.02	2.08
Corticosterone	18.9	64.9	12.9	12.1	12.4	13.0
Adrenaline	1.15	8.90***	25.20***	28.50*	16.90***	11.0*
Noradrenaline	15.4	21.4	38.3**	45.0*	30.9*	25.2
Insulin pmol/L	104	112	91	86	99	73
Glucose mmol/L	7.8	33.3***	18.9***	6.7	9.0	7.7
Lactate	2.23	4.87*	6.80***	4.32***	3.56*	2.58

Mann-Whitney U test: *p<0.05, **p<0.025, ***p<0.01

149 SEXUAL DIMORPHISM AND TESTOSTERONE EFFECTS ON LIVER EPIDERMAL GROWTH FACTOR (EGF) RECEPTORS IN MICE.

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EGF action is mediated by binding to specific plasma membrane receptors. Receptor binding is known to be influenced by hormones involving corticosterone and thyroxine. The EGF receptor population is heterogeneous regarding affinity with an increase in high affinity receptors with increasing age. We studied EGF receptors with regard to binding capacity and affinity in livers from adult male and female mice with or without testosterone treatment. Membranes from individual animals incubated with labeled EGF showed significantly higher binding in males and treated females than in control females. K_a and B_{max} were calculated from Scatchard analysis of labeled EGF binding to pooled membranes incubated with increasing amounts of nonlabeled EGF. Results:

	Controls		Testosterone Treated	
	K_a	B_{max} (pM/mg prot)	K_a	B_{max} (pM/mg prot)
Male	3.11×10^9	0.53	3.26×10^9	0.62
Female	1.59×10^9	0.30	2.96×10^9	0.54

Conclusions: 1) The sexual dimorphism of hepatic EGF receptors relates to both receptor affinity and capacity. 2) Testosterone treatment of females increases high affinity EGF receptor binding.

150 FIRST MORNING URINARY ALBUMIN:CREATININE PREDICTS MICROALBUMINURIA.

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Microalbuminuria (40-200mgm/day) in Insulin Dependent Diabetes Mellitus (IDDM) predicts the development of irreversible diabetic nephropathy. We have developed a specific albumin radioimmunoassay with sensitivity (detection limit 2ng) and coefficient of variation, intraassay <6%, interassay <12%, to detect microalbuminuria. 24 hour urinary albumin excretion (UAE) in 120 normal children, age 3.5-15yrs; 49 males, 71 females, showed a positively skewed distribution and after log transformation, the Geometric Mean (GM) is 5.96mg/l (range: 1.8-38.5). In 97 children with IDDM, aged 2-19yrs; 40 males, 57 females, the GM of UAE after log transformation is 5.75mg/l (range: 1.15-31.2) being no different from the normal range. As it is desirable to have the ability to predict UAE from a single urine specimen, we examined the first urine specimen passed in the morning for albumin concentration (mg/l), (FMAC), and the ratio of Albumin (mg/l) to Creatinine (mmol/l), (Alb:Cr) in that specimen. The combined normal & IDDM data, n=212, showed a highly significant correlation (p<.001) between UAE & FMAC (r=.81) & UAE & Alb:Cr (r=.74). Using this data, a first morning Alb:Cr of <2.5 predicted normal UAE (<38.5mgm/day) in 203/204 individuals and Alb:Cr of >2.5 predicted microalbuminuria (40-121mgm/day) in 8/8 individuals. The data also suggests that FMAC gives equally good prediction of microalbuminuria.

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Radioimmunoassayble Prealbumin in newborns,infants,children and adolescents.

The serum level of prealbumin (PA) was determined in 99(44 males) healthy newborn,infant,children and adolescent sera(range: 1 day-19 yrs) by means of a sensitive (<0.2 ug/dl),accurate(98.7% recovery) and precise(C.V.=3.6-9.5%) home-made RIA method.Correlation of this RIA with the radial immunodiffusion method was excellent (r=0.944).PA serum concentration showed a mean 43% enhancement over the 1st yr of life,as compared to neonatal levels. Age distribution of the PA serum values appears in the table.Relationship of PA with age was further supported by the striking direct correlation found (r=0.64,P < 0.001).Sex difference(P<0.05) was evident only from 10 yrs onwards.

Age	No.of subjects (% of females)	Mean±SD of RIA-PA (mg/dl) Males	Females	All
1-5 days	20 (60 %)	11.1±5.2	10.9±4.5	10.9±4.7
0.5-11 months	16 (56 %)	15.8±4.3	15.4±3.4	15.6±3.7
1-4 years	12 (58 %)	20.3±5.4	19.6±3.9	19.9±4.4
5-9 "	14 (57 %)	25.0±5.7	24.0±5.3	24.4±5.3
10-14 "	23 (52 %)	30.1±3.4	26.4±4.7	28.1±4.5
15-19 "	14 (50 %)	32.0±2.8	28.0±3.0	30.0±3.5 §

§ values not different from those of adulthood

152 THE RESPONSE OF PROLACTIN (PRL) AND GH TO L-DOPA IN OBESE CHILDREN AND ADOLESCENTS.

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Different hormonal alterations have been detected in obese subjects, mainly adults, and they have been attributed to dysfunction of the hypothalamus or the receptors. The response of PRL and GH has not been studied in children. In order to minimize the clinical heterogenuity, as much as possible, we studied subjects who have been obese since early infancy. Plasma PRL and GH were determined prior to and 30,60,90,120 minutes after L-DOPA P.O. (250-500mg), in 32 subjects, aged 9-14 years, 15 girls and 17 boys, 18 obese and 14 lean subjects. We found the following: PRL values (μU/ml) were lower in the obese (122,69, 34,32,19) than in the lean (154,89,54,52,43) with p < 0.05 to < 0.001 and the per cent decrease was greater in the obese (p < 0.05). This finding may indicate increased sensitivity of the lactophors to the dopaminergic stimulus or altered metabolism of L-DOPA in the hypothalamus. The values of GH (ng/ml) were lower post L-DOPA in obese prepubertal subjects (3.3, 5.7, 3.2, 1.3 versus 9.1, 7.1, 6.8, 4.1) with (p < 0.01). At puberty, the GH response was exagerrated in the lean subjects and diminished in the obese so that the difference between obese and lean individuals became more evident (p < 0.001). It seems that in childhood obesity, there exists a dysfunction either of the neurotransmitters in the hypothalamus or the receptors at the pituitary, primary or secondary to increased adipocity.