841 EFFECT OF DIETARY PROTEIN AND MAGNESIUM ON PLASMA TRIGLYCERIDE LEVELS IN WEANLING RATS Joan L.Caddell (Intr. by Arthur E. McElfresh). Dept. Pediatrics and Pathology, St. Louis University School of Medicine, St. Louis, Mo.

Hypertriglyceridemia, an important risk factor in the pathogenesis of atherosclerosis, has been difficult to produce experimentally. This study explores the effect of feeding purified diets varying in respect to magnesium (Mg) (0 to 150 mg/ 100 g) and casein (1 to 40 %) in male weanling rats 28-38 g in weight. Triglycerides were measured enzymatically on a Technicon SMAC auto-analyzer after A) 1 week, and B) 2 weeks of feeding the diets.

	Dietary Mg -- Casein	Plasma triglycerides mg/dl		P value*
A)	100 -- 20	91.0 ± 11.8	(22)**	- - -
	100 -- 10	57.6 ± 13.0	(5)	NS
	150 -- 40	82.7 ± 12.3	(4)	NS
	0 -- 20	195.4 ± 19.0	(9)	0.001
	0 -- 40	282.5 ± 54.1	(4)	0.001
B)	100 -- 20	81.4 ± 7.0	(5)	- - -
	150 -- 40	47.8 ± 6.1	(17)	0.05
	100 -- 1	14.0 ± 0.8	(3)	0.005
	5 -- 40	143.0 ± 13.9	(18)	0.05

*Compared with 100-20 by t test. NS= Not Significant. **Mean ± SEM.

A significant increase in plasma triglyceride levels was found in weanling rats with severe dietary Mg deficiency. Protein had little effect on the plasma triglyceride levels: at 2 weeks, emaciated, anorectic protein-deficient rats fed 100-1 diets (87 % glucose) had reduced levels. Supported by the Missouri Heart Assoc.

842 COMPARISON OF CATIONS FROM SELECTED TISSUES IN MAGNESIUM (Mg)-FED AND Mg-DEFICIENT BABY RATS TAKEN WHEN KILLED VS. TAKEN AFTER TWO DAYS POSTMORTEM. Joan L. Caddell and Rita Scheppner (Intro. by Arthur E. McElfresh), Dept. Pediatrics and Pathology, St. Louis U. Sch. Med., St. Louis, Mo.

To learn what effect a delayed autopsy might have on cation composition of diagnostic tissues, selected tissues were taken immediately after death, and remaining tissues from the same rats were taken after storage at 3° for 42-46 h. Cations were analyzed on an atomic absorption spectrophotometer and calculated on the basis of dry, defatted tissue weight. Cations in vitreous humor were relatively stable, but significant shifts of cations in or out of heart and skeletal muscle occurred in the opposite direction from those of bone in both Mg-fed and Mg-deficient rats.

Percent change in:	Mg	Ca	K	Na
A. Control rats fed 100 mg Mg/ 100 g diet, 20 % casein for 1 week.				
Vitreous humor	NS	NS	NS	--
Heart	↓ 4.9*	↓ 21.3#	↓12.7*	NS
Skeletal muscle	NS	↓ 14.6*	↓ 9.1*	↓17.2#
Sternum	↓ 7.4*	NS	↓14.5#	↓19.4#
Femur	NS	NS	↓20.6#	↓26.8#
B. Mg-deficient rats fed 0 mg Mg/ 100 g diet, 20 % casein, 1 week.				
Vitreous humor	NS	NS	NS	--
Heart	↓ 5.1*	↓14.8	NS	NS
Skeletal muscle	↓ 7.7#	↓46.4#	↓29.9#	↓44.3#
Sternum	↓24.4#	NS	↓15.6	↓12.0#
Femur	↓ 7.5**	↓ 6.8#	↓24.1#	↓31.7#

* P<0.05; ** P<0.005; # P<0.001 using Student's t test.

This work was supported by the Missouri Heart Association.

843 ALPHA AND BETA CELL FUNCTION IN CHILDREN WITH JUVENILE AND CHEMICAL DIABETES MELLITUS Salvador Castells, Chhaya Chakrabarti, and Anne C. Carter, Depts.of Ped. and Med., SUNY, Downstate Med. Ctr., Bklyn., N.Y.

Suppression of glucagon secretion by glucose has been suggested as an essential component of normal glucose tolerance. Children with chemical diabetes have abnormal OGTT with hyperinsulinism (Amer. J. Med. Sci. 271:35,76). Hypergluconinemia may play a role in the pathogenesis of juvenile diabetes. Thirteen chemical diabetics and 17 normal children had an OGTT (1.75gm/kg) and 20 juvenile diabetics and 8 controls had an oral L-alanine test (200mg/kg). Both tests were performed after an overnight fast, blood samples were drawn at 0,30,60,120 and 180 min. Blood glucose and plasma immunoreactive insulin and glucagon were measured. Chemical diabetics had significant hyperinsulinism at 60' ($p<0.05$), 120' ($p<.02$) and 180' ($p<.02$) and higher I/G ratio at 60' ($p<.05$), 120' ($p<.005$) and 180' ($p<.05$) after OGTT compared to controls. There was no significant differences in OGTT suppression of plasma glucagon levels in controls and chemical diabetics. Peak levels of glucagon after L-alanine occurred at 120' in controls and at 60' in diabetics. There was no significant difference between mean serum glucagon levels of diabetics and controls. Two poorly control diabetics had elevated basal and 30' serum glucagon levels 2 SD above the mean of the control. These results suggest that hypergluconinemia is only present in juvenile diabetics in poor control.

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844 NEONATAL EFFECTS OF 1,25 $(OH)_2$ VITAMIN D_3 ON IONIZED Ca (iCa), Ca ABSORPTION AND PARATHYROID HORMONE(PTH). Gary M. Chan, Reginald C. Tsang, I-Wen Chen, Hector DeLuca and Jean J. Steichen, U. of Cincinnati & U. of Wisconsin.

Defects in neonatal vit D (D) metabolism theoretically might be related to neonatal hypocalcemia. 1,25 $(OH)_2$ vitamin D_3 (1,25 $(OH)_2D_3$), the final D metabolite, has been used to overcome D metabolic blocks. Thirty-two prematures (≤ 37wks) were divided equally into 4 groups. Each group of 8 was pair-matched for gestation and birth asphyxia, and given daily oral 1ug 1,25 $(OH)_2D_3$, 0.05ug/kg 1,25 $(OH)_2D_3$, 400 IU D_2, or placebo (Pb) from 12 to 72 hrs of age. Pre-study serum PTH, (radioimmunoassay, N-terminal) was not different among the 4 groups. By 48 hrs, the 1ug/d 1,25 $(OH)_2D_3$ serum PTH was lower vs pretreatment, 59±9ul-Eq/ml (mean±SEM) vs 137±58ul-Eq/ml (Wilcoxon Rank t, $p<.01$) but was not different from the 3 other groups. At age 12 hrs, all infants had iCa < 3.5mg% (Orion SS-20, normal 3.6 to 4.5). By 48 hrs, 1ug/day 1,25 $(OH)_2D_3$group had significantly higher iCa, 3.6 ±0.1mg% vs 3.2±0.1 at 12 hrs (paired t, $p<.05$). Incremental iCa for 1ug 1,25 $(OH)_2D_3$ was greater than other 3 groups ($p<.05$). At 72 hrs of age, all infants had oral Ca tolerance (OCaT) 50mg/kg. Prior to OCaT, there were no differences in serum Ca among the 4 groups; the 1ug/day 1,25 $(OH)_2D_3$ infants had a significant rise in serum Ca at 2 and 3 hrs post-ingestion ($p<.05$). Peak serum Ca at 2 hrs averaged 1.2mg% vs <0.5mg% in the other 3 groups (no significant increase during OCaT). 1,25 $(OH)_2D_3$ increases intestinal Ca absorption in prematures and may be useful for the prophylaxis of neonatal hypocalcemia.

845 GLUCOSE DISPOSAL IN THE WELL LOW BIRTH WEIGHT (LBW) INFANT. Richard M. Cowett, Arnold Pollak, Barbara S. Ross, Robert Schwartz, and William Oh. Brown University Program in Medicine, Women and Infants Hospital of R. I. and Rhode Island Hospital, Departments of Pediatrics, Providence, R.I.

Glucose is the primary substrate for energy during parenteral alimentation of LBW infants. Hyperglycemia may result in glucosuria and osmotic diuresis when excessive glucose is infused. Tolerance for glucose was studied in 35 appropriate for gestational age well LBW infants (birth wt. M = 1216 gms, gestational age M = 30 wks) between 3-38 days of age. Infants received glucose: 8,11, or 14 mg/Kg/min for 3 hours by continuous peripheral intravenous infusion. Plasma glucose and insulin, and timed urine glucose and volume were measured (M±S.E.M.). A steady state (S-S) of plasma glucose was noted by one hour at all infusion rates.

Group (No.)	Infusate (mg/Kg/min)	Plasma Glucose (S-S mg/dl)	Plasma Insulin (at 2 hr μU/ml)	% Excreted (MAX)
A (9)	8.1±0.2	93±5	5±2	0.20±0.1
B (15)	11.2±0.2	158±5	27±6	0.53±0.2
C (11)	14.0±0.1	183±1	47±8	0.82±0.2

There were significant increases in S-S plasma glucose ($p<.001$) and insulin ($p<0.05$) in Groups B and C compared to Group A. Glycosuria did not exceed 0.28 mg/Kg/min, so that glucose disposal (retention) exceeded 97.7% of infusate. Group B was heterogeneous with respect to plasma glucose and plasma insulin responses. No significant osmotic diuresis from glucose was noted. The data suggests well LBW infants tolerate glucose to 14 mg/Kg/min between 3-38 days of age without significant glucosuria.

846 JUVENILE DIABETIC ARTHROPATHY. Hong C. Dang, Joseph K. Hindman, John W. Mace, (Spon. by James J. Quilligan). Loma Linda University School of Medicine, Department of Pediatrics, Loma Linda, California.

Juvenile diabetes mellitus (JDM) is observed to have a high frequency of arthropathy, usually flexion contracture of the fingers. Flexion contracture of the fifth finger only is Class I, and more than one finger on a hand is Class II. Studies of 188 children age 7-15 showed:

Duration of JDM in # of Months	# of Subjects	Class I	Class II	% with Arthropathy
1- 24	47	3	5	17.0
25- 48	45	7	6	28.8
49- 72	40	10	5	37.5
73- 96	34	7	7	41
97-120	12	3	3	50
121-≥144	10		4	40

Follow-up over one-year period of 55 patients revealed 11 of them to have changes in their arthropathy:

Arthropathy	# of Subjects	Control of JDM: Better	Same	Out of Control
Improving	6	2	4	
Worsening	5		2	3

Our studies suggest a correlation between the duration of JDM and the occurrence of arthropathy. Moreover, there appears to be a correlation between good diabetic control and less arthropathy.