859

SERUM 24,25 DIHYDROXY VITAMIN D CONCENTRATIONS IN LACTATING AND NON-LACTATING POST PARTUM WOMEN. Laura S. Hillman, Sugunamba Sateesha, Eduardo Slatopolsky, John G. Haddad (Spon. by R.E. Hillman), Washington Univ. School of Med., St. Louis Children's Hosp. Dept. of Peds., Barnes Hosp. and Jewish Hosp. of St. Louis, Depts. of Med., St. Louis, MO.

In aminal systems prolactin (HPL) increases 1,25 dihydroxy vitamin D (1,25(OH)$_2$D) and decreases 24,25 dihydroxy vitamin D (24,25(OH)$_2$D) synthesis. 24,25(OH)$_2$D is low during pregnancy with normal serum PTH. During pregnancy, serum HPL and other hormones are increased, but during lactation only HPL remains elevated. We studied lactating mothers and non-lactating controls for 24,25(OH)$_2$D, 25OHD, PTH, HPL, calcium and magnesium at 6 weeks post partum. In nursing mother 24,25(OH)$_2$D was significantly lower than normal or post partum controls. During lactation only there was an inverse correlation between HPL and 24,25(OH)$_2$D (R=-.51) and PTH and 24,25(OH)$_2$D (R=-.47). During lactation there was no correlation between 24,25(OH)$_2$D and 25OHD (R=.18). Thus, changes in vitamin D metabolism probably mediated by HPL and PTH may enable the lactating woman to maintain normal serum calcium and magnesium while providing for milk production.

	Normal adults	Non-lactating(13)	Lactating(17)
24,25(OH)$_2$D ng/ml	3.7±.2 (n=42)	2.5 ± .35	1.75 ± .18
25-OHD ng/ml	24±1.5 (n=42)	17.6 ± 1.5	19.3 ± 1.3
PTH µl Eq/ml	7.4±0.4(n=47)	7.9 ± .48	6.6 ± 1.3
HPL ng/ml	9.0±.6 (n=29)	18.6 ± 4.8	54.4 ± 10.5
Calcium mg%	9.66±.01(n=66)	9.09 ± .34	9.48 ± .51
Magnesium mg%	1.67±.02(n=39)	1.59 ± .05	1.63 ± .09

860

MARKED ELEVATIONS OF OCTANOIC ACID AND OTHER MEDIUM CHAIN FREE FATTY ACIDS UNASSOCIATED WITH CEREBRAL SYMPTOMS. Richard E. Hillman, Darryl C. DeVivo, James P. Keating. (Spon. by Jean Holowach). Washington Univ. Sch. of Medicine, St. Louis Children's Hospital, Dept. of Pediatrics, St. Louis, Missouri.

Octanoic and other short and medium chain free fatty acid concentrations (FFA) have been noted to be elevated in Reye syndrome and infusion of these substances has produced a similar syndrome in animals. Thus, these substances have been implicated as causal factors for some of the symptoms in this problem. MCT's are used to treat a variety of children. They have been demonstrated to produce elevations of FFA in dogs. We measured medium chain FFA in patients receiving MCT's chronically. A patient with type IB glycogenosis had extreme elevations of C7-C10 FFA. She also had elevated butyrate and isobutyrate but not propionate or valerate levels. Patients receiving MCT's as part of a ketogenic diet had mildly elevated concentrations of C8 and C9 FFA and variable concentrations of C7 FFA. None of these patients had cerebral symptoms. Thus, elevations of medium chain FFA may be a secondary phenomenon in Reye syndrome.

	µM			
	C7	C8	C9	C10
Type IB (1)	229	56	39	23
Ketogenic diet (4)	var.	9-18	4.4-5.7	0.6
Normal (10)	<1.5	0.7-2.8	<1.3	0.6-1.2

861

VALPROIC ACID (DIPROPYLACETIC ACID)-AN INHIBITOR OF BRANCHED CHAIN FATTY ACID DEHYDROGENASE. Richard E. Hillman, Leonard Berg, Darryl C. DeVivo. (Spon. by Jean Holowach). Washington Univ. Sch. Med., St. Louis Children's Hospital, Dept. of Pediatrics, St. Louis, MO.

Sodium valproate, a new anticonvulsive agent, has been noted to produce hyperglycinemia and hyperglycinuria. Measurement of free short chain fatty acids in patients receiving this drug demonstrate elevations of isobutyric, 2-methyl butyric, and isovaleric acids but not butyric acid. Thus, this drug appears to be an acyl-CoA dehydrogenase inhibitor. However, unlike hypoglycin, it appears to have a greater effect on branched chain than straight chain fatty acids. Since this drug appears to produce a secondary "hyperglycinemia syndrome", it may provide a model for studying some aspects of diseases of branched chain amino acid metabolism which are associated with altered glycine metabolism.

	Serum concentrations (µM)			
	IsoButyr	Butyr	2-MeButyr	Isovaler
Patients (3)	9.1, 5.6 6.2	0.9, 0.6 0.6	11.5, 4.1 3.8	20.9, 7.9 8.9
Controls (27)	0.8±0.4	0.7±0.5	trace	1.6±0.7

862

EVALUATION OF THE RENIN-ALDOSTERONE SYSTEM DURING HYPO- AND HYPERGLYCEMIA IN CHILDREN AND ADOLESCENTS. Zeev Hochberg, Zvi Dickerman, Hayutah Kaufman and Zvi Laron (Spon. by Frank A. Oski) Inst. of Pediatric and Adolescent Endocrinology, Beilinson Med. Ctr., Petah Tikva, Israel.

The effect of insulin-induced hypoglycemia and glucose loading on the renin-aldosterone system was studied in 10 normal children and adolescents, aged 8 to 16 years in an attempt to find a simple tool for the evaluation of this system. The nadir of insulin induced hypoglycemia was followed 15 min. later by a 371 ± 139% (m ± SEM) elevation of plasma renin activity (PRA), from a basal level of 2.9 ± 0.4 ng/ml/hour (m ± SEM) to 7.9 ± 1.9 ($p < 0.025$). Plasma aldosterone levels increased 243 ± 21% (m ± SEM) from a basal level of 7.3 ± 0.7 ng/dl to 19.9 ± 2.3 ($p < 0.005$). A standard oral glucose load (1.75 g/kg body weight) was followed by an insignificant elevation of PRA. Plasma aldosterone levels decreased 53 ± 11% (m ± SEM) 15 min. after the glucose peak, from 10.6 ± 1.1 to 3.9 ± 0.2 ng/dl ($p < 0.005$). The theoretical basis by which insulin-induced hypoglycemia results in the elevation of PRA and aldosterone could be a combination of K^+ ion shift, ACTH secretion, catecholamine surge and glucagon rise. All of these are known to be stimulated by insulin hypoglycemia and to stimulate the renin aldosterone system. The aldosterone suppression by the oral glucose load was independent of the PRA. The mechanism of this suppression is still unknown. It is suggested that the ease of administration makes the insulin tolerance and oral glucose tolerance tests useful in the investigation of the renin aldosterone system.

863

THE QUANTITATIVE EVALUATION OF NUTRITIONAL RICKETS USING URINARY PHOSPHATE EXCRETION. Zeev Hochberg and Daniel Hardoff (Spon. by Frank A. Oski), Dept. of Peds, Rothschild University Hospital, Haifa, Israel.

Phosphaturia is a prominent feature of nutritional rickets. This investigation was designed to study the application of phosphaturia in the quantitative assessment of nutritional rickets. Seventeen infants aged 4-7 months with nutritional rickets were studied. The severity of the rickets was determined using clinical, radiological and chemical criteria. A scoring method was designed with 9 parameters, each scored from 0 to 3. The additive score defined the severity of the disease. This was correlated with the degree of phosphaturia, measured by tubular reabsorption of phosphorus (TRP) and the phosphate excretion index (PEI). TRP and PEI were calculated from a single blood and concomitant urine specimen. TRP was negatively correlated with the severity of nutritional rickets $r = 0.914$ $p < 0.005$. The infants who were most severely affected, as expressed by higher scores, had the lowest TRP (32-70%). The PEI correlated positively with the scores ($r = 0.873$, $p < 0.01$). The more rachitic infants had higher PEI's, in the range of 0.25-0.61. These data indicate that the severity of nutritional rickets can be assessed by calculating the TRP and PEI from a single blood and urine specimen obtained simultaneously.

864

SUPPRESSOR T CELL FUNCTION IN DIABETES MELLITUS. Sheldon D. Horowitz, Wayne Borcherding, Gerald J. Bargman. University of Wisconsin Center for Health Sciences, Department of Pediatrics, Madison.

Autoaggression against pancreatic islet cells has been described in patients with diabetes mellitus. Based on the hypothesis that a loss of immune regulatory suppressor T cells could be important in the development of these autoaggressive reactions, we examined suppressor T cell function in 14 children with insulin-dependent diabetes mellitus. Suppressor cell activity was determined by assessing the effect of concanavalin A-treated lymphocytes on the one-way mixed leukocyte culture reaction. Suppressor cell activity was demonstrated in 15 of 15 normal controls. However, 11 of 14 patients with insulin-dependent diabetes mellitus lacked suppressor T cell function. In our sample, age, sex, duration of diabetes mellitus and control of the disease did not correlate with the presence or absence of suppressor cell activity. Our data suggest that decreased suppressor T cell function may be important in the pathogenesis of some forms of diabetes mellitus. The relationship of HLA (HLA-A,B,C, D) and suppressor T cell function in diabetes mellitus is being investigated.