727 COMPARISON OF THE EFFICACY OF CA AND P FORTIFICATION IN HUMAN MILK.

Richard J. Schanler, Cutberto Garza, Buford L. Nichols, Baylor College of Medicine, USDA/ARS Children's Nutrition Research Center, Department of Pediatrics, Houston, TX.

Calcium (Ca) and phosphorus (P) deficiency was observed in earlier studies of 17 preterm infants fed a preparation of fortified mother's milk derived from pasteurized, lyophilized fractions of mature human milk (Group I, birthweight, 1178 ± 36 g, gestation, 29 ± 0.2 wk, Mean ± SEM). A modified preparation of this fortified mother's milk with added Ca lactate and P salts was fed to 8 infants (Group II, 1088 ± 53 g, 28 ± 0.3 wk) for the first two months postnatally. 96-h balance studies were conducted at approximately weeks 3 and 7.

Gp	CaI	CaU	CaR	CaABS %	PI	PU	PR	PABS %
I	58 ± 2	6 ± 1*	22 ± 3	48 ± 5	33 ± 1	2 ± 1	27 ± 1	88 ± 2
II	111 ± 3	5 ± 1*	65 ± 7	66 ± 5	68 ± 4	16 ± 2	54 ± 5	96 ± 1

(* P > 0.10, all other comparisons P < 0.02)

Group II achieved significantly greater intakes (CaI,PI), retentions (CaR,PR), and absorptions (CaABS, PABS) of both Ca and P, and greater urinary excretion of P(PU). Proportionally greater urinary excretion of Ca(CaU) was observed in Group I (P = 0.003). Serum P was greater and alkaline phosphatase was lower in Group II (P < 0.01). These results indicate that the addition of both Ca and P to fortified mother's milk will reverse Ca and P insufficiency and lead to retentions of Ca and P which approach the fetal accretion more closely than previous human milk preparations.

728 *TRANSIENT ISOLATED HYPERPHOSPHATASEMIA: A VARIANT OF THE ULYSSES SYNDROME.*

David E. Schmidt; Jerry L. Rosenblum; Robert J. Rothbaum; James P. Keating; Washington Univ. School of Med., Children's Hosp. at Washington Univ., Dept. of Pediatrics, St. Louis, MO

From 1979-1984 we evaluated 7 patients ≤28 mos. old because of an isolated elevation of serum alkaline phosphatase activity. Biochemical studies and, in some patients, further investigations including bone marrow aspiration, jejunal biopsy, skeletal survey, radionuclide and CT scans, UGI series, and IVP provided no explanation for the elevated SAP. Mean duration of the hyperphosphatasemia was 6.7 weeks (range 2-10 weeks). Presenting signs and symptoms gradually resolved.

PT	AGE (mos)	SEX	SAP (IU/l)	PRESENTATION	DURATION OF SAP ELEVATION
1	5	F	6210(20xURL*)	Failure to thrive	6 weeks
2	15	F	9051(30xURL)	Vomiting	10 weeks
3	9	M	2650(9xURL)	Diarrhea/vomiting	Undetermined
4	19	M	6560(22xURL)	Diarrhea	8 weeks
5	17	F	4000(13xURL)	Failure to thrive	10 weeks
6	28	M	1169(4xURL)	Diarrhea	4 weeks
7	10	F	1075(4xURL)	Failure to thrive	2 weeks

** URL-upper reference limit*

A fruitless diagnostic evaluation triggered in response to an abnormal test result inadvertently generated by automated screening has been called the Ulysses syndrome. Recognition that isolated hyperphosphatasemia in infants and young children may be transient and benign will avoid the potential risks and expense of additional testing and may ease parental anxiety.

† 729 PANCREATIC FUNCTION TESTING WITH A LIPID ANALOGUE.

Howard R. Sloan, Constance S. Seckel. Ohio St. Univ. Coll. of Med., Dept. Peds., Cols., OH.

To develop a simple, non-invasive technique for evaluating pancreatic lipolytic activity, we have synthesized a triglyceride analogue containing para-aminobenzoic acid (PABA) esterified to carbon-3 of glycerol. The lipid, dipalmitoyl-mono-para-aminobenzoyl glycerol (diPalm GMPA), is hydrolyzed by pancreatic lipase, and the PABA released from it is absorbed, conjugated in the liver and excreted in the urine. To rats with ligated pancreatic ducts and to sham-operated controls, we administered, per gavage, 85 mg/kg of diPalm GMPA and collected blood and urine for up to 48 hours. In neither group of animals did blood PABA ever rise significantly above baseline values. By 12 hours, 6.3 ± 3.9% of the administerd PABA was recovered in the urine of the ligated rats and 38 ± 8.1% in the urine of the control rats; at 24 hours the values were 11.2 ± 6.3 and 68 ± 10.3%, respectively. To a dog with spontaneous pancreatic acinar atrophy and a control, we gave 40 mg/kg of diPalm GMPA. Blood PABA levels remained unchanged in both animals. By 8 hours, 12.9% of the administered PABA was recovered in the control dog's urine but only 1.50% in the test dog's urine. Conclusions: DiPalm GMPA may be a useful probe to evaluate pancreatic lipolytic function. The modest serum levels of PABA following diPalm GMPA administration suggest slow digestion/absorption of the lipid substrate coupled with rapid clearance of the liberated PABA from the blood.

730 TREATMENT OF VITAMIN E DEFICIENCY IN CHRONIC CHILDHOOD CHOLESTASIS WITH ORAL d-α-TOCOPHERYL POLYETHYLENE GLYCOL-1000 SUCCINATE (TPGS).

Ronald J. Sokol, Nancy A. Butler-Simon, Arnold Silverman, (Spons. by K. Michael Hambidge) Univ. of Colo. Schl. of Medicine, Dept. of Pediatrics, Denver, Colorado.

Chronic malabsorption and deficiency of vitamin E (E) during chronic childhood cholestasis (CCC) leads to a progressive degenerative neurologic disorder. The treatment of E deficiency during severe CCC is hampered by the inability of many patients to absorb even massive oral doses of available E preparations, requiring therapy with parenteral forms of E. This study was designed to evaluate intestinal absorption of, and chronic therapy with, a water-soluble form of E (TPGS) during CCC. We studied 6 children (ages 8 mo-14 yr) with well documented E deficiency caused by CCC, each of whom had failed to show increase in serum E levels (3.9-15.5 μg/ml=Nl) or ratios of serum E to total lipids (E/L; >0.6 mg/g=Nl) after 1-3 months of therapy with 60-150 IU/kg/day of oral dl-α-tocopherol. An oral E tolerance test (OVETT) was performed using 100 IU/kg of TPGS. Serum E (fluorometric method) and total lipid levels (colorimetric method) were drawn at 0,+6,+12,+18,+24,+36, and +48 hours. Each child was then treated with 50 IU/kg/day of TPGS; E status monitored after 2 and 4 weeks. Results ($\bar{x}$ ± SEM) in Table.

	OVETT (n=5)		Chronic Therapy (n=6)	
	Baseline	Peak	2 Weeks	4 Weeks
Serum E (μg/ml):	2.4 ± 0.6	8.0 ± 2.0	11.9 ± 2.7	13.9 ± 3.2
Serum E/L (mg/g):	0.21 ± 0.04	0.67 ± 0.09	0.90 ± 0.15	1.15 ± 0.12

Conclusion: TPGS is absorbed enterally during severe CCC, corrects the biochemical indices of E deficiency, and, therefore, should be considered in those children with CCC unresponsive to available forms of oral E.

● 731 EFFECT OF BETHANECHOL (B) ON ESOPHAGEAL PERISTALSIS OF INFANTS WITH GASTROESOPHAGEAL REFLUX (GER).

Judith Sondheimer, Georgianne Arnold, Department of Pediatrics, SUNY Upstate Medical Center, Syracuse, New York.

The immediate effect of B on esophageal pH records of infants with GER is to shorten reflux episodes rather than to decrease reflux frequency. To test the hypothesis that changed esophageal motor function might account for improved acid clearing ability we assessed peristaltic amplitude, velocity and duration in distal, mid and upper esophagus and lower esophageal sphincter pressure (LESP) in infants (3-20 mos) with untreated GER before and 10,20 and 30 min after SQ injection of B. At random, seven infants (GrI) received .1mg/kg and 9 (GrII) received .2mg/kg B. Resting LESP was >15mmHg in all pts. Triple lumen N_2 powered perfused catheter was used. Results: Baseline manometric parameters were similar in GrI and II. Mean LESP increased in both groups 10 and 20 min after B but maximum LESP was higher in GrII than GrI (64.4±6.4 vs 42.2±4.0 mmHg; $\bar{x}$±SE;p<.01). In GrI, no change in peristalsis occurred after B in any esophageal segment. In GrII, mean peristaltic amplitude in distal esophagus rose from 73.6± 5.1 to 129.2±8.2 mmHg 10 min after B (p<.01) and persisted for 20 min. Peristaltic velocity decreased in distal (2.1±7 to .75± .1 cm/s) and mid esophagus (3.6±1.0 to 1.0±.1 cm/s) maximally 30 min after B (p<.01). Distal esophageal peristaltic wave duration increased 20 min after B (4.1±.5 to 5.5±.5 sec;p<.01). The upper esophagus in GrII did not respond to B. Conclusion: The LES is more sensitive to B than the esophageal body. High dose B induces high amplitude slow moving distal esophageal peristalsis which may account in part for improved acid clearance in B-treated GER

732 THE USE OF ANTIBIOTICS TO STUDY EPITHELIAL TRANSPORT SYSTEMS OF CF-PATIENTS IN VIVO.

Fritz Sörgel, Ulrich Stephan, Hans G. Wiesemann, Hans C. Dominick, Bernhard Böwing, Departments of Pediatrics, Universities of Essen, Münster and Erlangen, FRG (Spon. by

Absorption, salivary excretion and renal clearance of four antibiotics have been used to study the excretory function of the respective epithelia in CF. AUC (area under plasma concentrations curve), c_{max} (maximum plasma concentration).

	AUC (μg.h.ml^{-1})		Renal clearance (ml/min)		Half-life (hrs)		c_{max} (μg/ml)	
	C	CF	C	CF	C	CF	C	CF
Cefadroxil	102.0 ±7.9 ns	102.3 ±10.9	180 ±20 ns	145 ±30	3.4 ±0.4 ns	4.0 ±1.3	26.14 ±3.3 ns	25.5 ±4.5
Cefaclor	29.8 ±9.5 ns	38.4 ±4.7	432 ±50 ns	362 ±40	1.19 ±0.2 ns	1.79 ±0.5	21.3 ±6.5 ns	20.0 ±3.5
Ciprofloxacin	9.9 ±3.4 ns	13.7 ±5.8	not measured		5.15 ±2.5 ns	4.47 ±1.7	3.04 ±1.22 ns	2.12 ±0.29

The renal clearance of cefotiam (1 g i.v.) was 218±32 in C and 264±66 in CF. The ratio of saliva to plasma concentration (S/P) was 0.02 for the cephalosporines and 0.3 for ciprofloxacin with no differences between C and CF. Our findings are in contrast with previous findings. We conclude that the absence of significant changes in the epithelia tested is a consequence of our very rigid quality assurance system of drug analysis, use of adequate control groups and the omission of weight and body surface corrections often used unproperly. Our findings have also practical consequences: antibiotics should not generally be dosed higher to correct for impaired absorption as done presently.