

**566** INTRALUMINAL FAT PROCESSING IN CYSTIC FIBROSIS. J. Nevin Isenberg and Geraldine K. Powell, University of Texas Medical Branch Hospitals, Department of Pediatrics, Galveston, Texas.

Although pancreatic insufficiency is the major factor in the non-absorption of cystic fibrosis (CF), many patients continue to have steatorrhea despite often excessive amounts of exogenous enzyme. Stool collections from 7 unsupplemented CF patients were analyzed for free fatty acids (FFA) and total fat (TF). FFA averaged 60% of TF in comparison to analyses from 15 enzyme supplemented CF patients with FFA >90% TF despite fat absorption coefficients from 45 to 95%. This implies correction of digestion with continuing fat malabsorption. Intraluminal fat processing was evaluated over consecutive 30 minute periods following a standard meal (JCI 43:247,1964) in 4 CF patients. Mean intraluminal bile acid concentrations (mM) for the four were  $14.4 \pm 2.7$ ,  $8.9 \pm 1.4$ ,  $7.0 \pm .9$  and  $5.5 \pm .7$  compared to nonCF controls ( $N=7.7 \pm 2.1$ ). The fraction of luminal FFA incorporated into micelles (%MI) was 38, 33, 27 and 19 respectively in comparison to N with %MI=51  $\pm$  12. Intraluminal pH was below 5.1 ( $N=6.1 \pm 0.5$ ) in 20/43 meal fractions from CF patients with steatorrhea. 90% of the acidic fractions came from the last parts of the 2 hour study. Only 3/16 meal fractions were <pH5.1 in non-steatohrheic CF patients. Cimetidine plus enzymes restored pH and improved lipolysis (luminal FFA/luminal TF) toward normal levels but had less impact on %MI. These findings suggest that some patients with CF may have a defect in micellar incorporation despite the presence of adequate bile acid concentrations and normal intraluminal pH.

**567** OXYGENATED CHOLESTEROLS: NEW RISK FACTORS FOR ATHEROSCLEROSIS? Marc S. Jacobson, Padmanabhan P. Nair, Syed M. Naseem, Thomas D. Smith, and Felix P. Heald. Univ of MD Sch of Med, Dept of Ped, Baltimore

Previous reports have shown oxygenated derivatives of cholesterol (C) to be angiotoxic in vivo and in-vitro in animal models of atherosclerosis and have demonstrated their presence in processed, C containing foods. In this study abdominal aorta obtained from 8 adolescent trauma victims at autopsy was chemically analysed for the presence of these compounds. All aortas contained atherosclerotic lesions which were dissected out, freed of adventitial fat, minced, extracted in chloroform:methanol 2:1 then saponified in 15% KOH. The non-saponifiable lipid (sterol) was separated in a two stage thin layer chromatography system using Ether: Benzene: Ethyl Acetate then Ether: Heptane on Silica Gel G plates. Bands corresponding to known standards were then scraped and eluted in chloroform, converted to trifluoro-acetates, and quantified by gas liquid chromatography. Significant levels of two oxygenated C derivatives known to be cytotoxic were found. These were ( $\bar{x} \pm S.D.$ ) 25-OH cholesterol  $213 \pm 108 \mu\text{g}/100 \text{ mg}$  of lipid and cholesterol 5,6 epoxide  $25 \pm 13 \mu\text{g}/100 \text{ mg}$  of lipid. C content was  $58 \pm 18 \text{ mg}/100 \text{ mg}$  of lipid. The concentration of C in the lesions was positively correlated with the level of 25-OH C. These data are consistent with earlier studies of tissue from older individuals with more advanced lesions and suggest a role for these compounds in the current epidemic of early onset of atherosclerosis.

**568** MALNUTRITION IN INFANTS WITH ACUTE DIARRHEAL SYNDROME. F. Jalili, V. Nichols, O. Smith, K. Fraley, A.A. Mintz, and B. Nichols. USDA/SEA, Children's Nutrition

Research Center, at Baylor College of Medicine, Houston, Texas. This study was designed to identify the nutritional status in infants admitted with acute diarrheal syndrome (ADS). ADS is defined as diarrhea which lasts for a period of 2 weeks or less. 110 ADS patients, 9 months old or less, were admitted to Ben Taub General Hospital in 1978. The hydrated weights of these infants were compared with 108 healthy infants of similar age from the same geographic area who were attending Well-Child Clinic in 1978.

The proportion of the male and female, and distribution of the infants with regard to different ethnic groups were comparable. Age and marital status of the mothers were approximately the same in both groups. 15.4% of the ADS patients were below the 5th percentile for weight by age, but only 4.8% of healthy infants were at this level ( $P=0.0005$ ). 45.3% of the ADS patients, compared with only 10.8% of healthy infants, were at or below the 10th percentile for weight ( $p<0.0001$ ).

% of Ideal wt/age	ADS	(n)	Healthy Infants	(n)	P value
Birth Weight	$3076.6 \pm 656$	(95)	$3234.1 \pm 505.2$	(102)	0.06
% LBW	19.7	(95)	11.1	(102)	0.1
Gravidas of the Mothers	$2.5 \pm 1.7$	(90)	$1.7 \pm 1.1$	(64)	0.0005

Our data indicate that malnutrition was a significant factor predisposing to the development of ADS requiring hospitalization.

**569** FREE FATTY ACIDS (FFA) IN BREASTMILK JAUNDICE (BMJ). F. Jalili, C. Huang, C. Garza, B.L. Nichols. USDA/SEA, Children's Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine, Houston, Texas.

The incubation, at 4°C, of milk from mothers of infants with breastmilk jaundice is reported to result in significantly higher levels of free fatty acids compared to milk from controls. Single milk samples collected under standard conditions were obtained from 4 mothers of infants with BMJ and 14 control donors matched for stage of lactation. Milk samples were analyzed for FFA using thin layer-gas chromatographic techniques. In addition serum total fatty acids were measured in mothers and infants. As summarized in the table, no differences were observed in milk FFA concentrations before or after incubation in control and experimental samples. Similarly, no differences were detected in total serum fatty acids in either infants or mothers.

	Unit	Control	BMJ	P
Total FFA before storage	mg%	$51.2 \pm 22.0$	$56.9 \pm 15.0$	0.5
Total FFA after storage	"	$218.0 \pm 82.0$	$249.0 \pm 172.0$	0.7
Total serum fatty acids of infants	"	$279.7 \pm 68.6$	$296.4 \pm 27.5$	0.6
Total serum fatty acids of mothers	"	$326.6 \pm 119.0$	$326.4 \pm 177.0$	0.7

Analysis of milk showed no differences in FFA composition between groups. The observation that increased FFA levels in milk or increased lipase activity is associated with breastmilk jaundice was not confirmed.

**570** EFFECTS OF VARIOUS VOLUMES OF POOLED HUMAN MILK (PHM) IN PRETERM INFANTS (PTI). A.-L. Järvenpää, D.K. Rassin, N.C.R. Riihijä and G.E. Gaull. NYS Inst Basic Res M.R., Staten Is., and Dept. Obst., Helsinki Univ. Hosp.

PHM reduces metabolic cost during growth, although its nutritional sufficiency is debated. We report growth and metabolic comparisons amongst PTI (gest. age  $T_2=31-33$ ,  $T_3=34-36$  wks) fed 170 (group A), 185 (B) and 200 ml/kg/day (C) of PHM and compare results among groups and with breast-fed, full-term infants (FTI).

No consistent differences among A, B, & C were observed in measures of linear growth or head circ. PTI in B ( $T_2=104 \pm 12$ ,  $T_3=116 \pm 4$  g/kg/wk) and C ( $T_2=110 \pm 16$ ,  $T_3=108 \pm 8$ ) gained weight more rapidly than those in A ( $T_2=95 \pm 8$ ,  $T_3=83 \pm 16$ ).

Serum alb did not differ among A, B, & C but was lower in A, B & C than in FTI. After the first 2 weeks, mean pH in B & C approached that in FTI (7.39), whereas A remained signif lower (7.32-7.36). Base excess in A remained lower than in FTI; plasma bicarbonate was lower in A, B, & C than in FTI. BUN was lower in A than in FTI and intermediate and variable in B & C. Plasma amino acids fell into three groups: (1) A was lower than B, C or FTI (tau, met, cys, ser, gly, asp); (2) FTI was higher than A, B, or C which did not differ (glu, gluNH<sub>2</sub>, ala, leu, ileu, val, tyr, phe); (3) no differences (thr and cit).

Thus, while PHM in PTI gives adequate growth without undue metabolic cost, 185-200 rather than 170 ml/kg/day may be required.

**571** CONSERVATIVE MANAGEMENT OF ESOPHAGEAL AND PHARYNGEAL PERFORATIONS IN THE NEWBORN. Dana E. Johnson, John E. Foker, David P. Munson, Andre J. Nelson, Pakshi R. Athinarayanan, and Theodore R. Thompson. (Spon. by William

Krivit) Univ. of Minn. Medical School, Dept. Pediatrics, Mpls, Mn.

Perforation of the pharynx or esophagus is a well-described condition in the neonatal period. Controversy exists, however, whether medical or surgical therapy is the most appropriate management of such perforations. Eight cases of neonatal pharyngeal/esophageal perforation in premature infants were treated medically with antibiotics, nutritional support and closed chest-tube drainage of pneumothoraces. The times of perforation varied from 1-10 days of life and were usually associated with passage of oro-gastric feeding tubes. All perforations healed without surgical repair. No mortality or morbidity occurred in any of our patients secondary to these perforations. A review of these eight cases, and an additional seventy-four cases from the literature, revealed no difference in outcome between early surgical intervention and medical management. While certain complications such as mediastinal mass formation are definite indications for surgical drainage, most neonatal perforations of the pharynx or esophagus can be initially managed medically. Medical therapy with close observation for signs of sepsis and/or mediastinal changes will enable most newborn infants to avoid the stress of surgery and identify those infants where surgery is definitely indicated.