451 UREA CYCLE ENZYME ACTIVITIES AND ULTRASTRUCTURAL FEATURES OF TETRACYCLINE-INDUCED FATTY LIVER. Lester L. Lansky, Leland Hong and George Hug. Depts. of Peds., Univ. of Kansas and Cincinnati, Kans. City, Ks. and Cinn. OH.

Tetracycline-induced fatty liver(TFL)in animals and humans produces clinical and biochemical features similar to idiopathic fatty liver of pregnancy and Reye's syndrome(RS). The light microscopic features of hepatic panlobular microvesicular steatosis with no necrosis or inflammation is common to TFL and RS. We measured hepatic urea cycle enzymes carbamyl phosphate synthetase(CPS),ornithine transcarbamylase(OTC),and arginase(ARG) in 20 day old weanling rats after administration of tetracycline 40 mg/kg and 100mg/kg intraperitoneally daily for 7 days. Tetracycline was infused daily intravenously to another group of 20 day old weanling rats for 3 days. Control rats were injected IP and IV with similar doses of ascorbic acid. Hepatic CPS,OTC and ARG was determined in the IP and IV tetracycline-injected rats and the ascorbic acid-injected(control)rats. Mean CPS values were 39.0±9.55 nanomol.cit./mg.prot/min,OTC 651.1±337.6 nanomol.cit/mg.prot./min. and ARG 3143.3±1954.2 nanomol.urea/mg.prot/min. In the TFL group the values for control animals were 35.5(CPS), 564.6(OTC), and 1762.7(ARG)respectively. E/M features revealed normal mitochondria with abnormal peroxisomes. TFL in weanling rats produced no depression of urea cycle enzyme activities and no mitochondrial ultrastructural abnormalities resembling RS. Further studies are in progress to define the biochemical and ultrastructural correlates of TFL as an animal model of RS.

452 NEONATAL GASTRIC MOTILITY IN DOGS: MATURATION AND RESPONSE TO PENTAGASTRIN. Michael H. Malloy, Susan E. Denson, Frank H. Morriss, Eugene W. Adcock, and Norman Weisbrodt. (Spon. by R. R. Howell). Univ. of Texas Medical School at Houston, Depts. of Pediatrics and Physiology, Houston.

The postnatal development of gastric motility and pH, and the response to pentagastrin (PG) were studied at 10 intervals in 5 beagles from birth to 6 weeks. Motility was monitored using twin single lumen 1.7 mm catheters with 1 mm side openings at the tips which were 2 cm apart. Catheters were perfused with distilled H_2O at a constant rate and pressure transducers were interposed in the system. Oral catheter insertion distance to the antrum of the stomach was determined radiographically. Puppies were fasted 3-6 hours prior to study; gastric contents were aspirated, and the stomach rinsed with distilled H_2O. After an initial gastric pH determination and a 10-20 min. period of baseline motility monitoring, the response to 8 μ g/kg of s.c. PG was determined.

Baseline mean antral contractions increased from 0.25/min on day 1 to 2.0/min on day 11 through weaning in the 4th week when the frequency decreased to $<$ 1.25/min. Fundal contraction frequency and pressure increased during the 3rd week from significantly lower levels than the antrum suggesting the development of propagated peristalsis. Control gastric pH was $>$ 6.0 until day 7 when mean pH was 3.4. PG produced a significant decrease in pH on day 3 ($p < 0.05$), but the maximum decrease did not appear until day 9 and thereafter ($p < 0.005$). PG inhibition of the frequency and force of antral contractions was apparent from the 3rd day through the 6th week.

These observations in beagle puppies suggest a developmental maturation in gastric motility and acid secretion from birth through the 2nd week, and a delay in responsiveness to PG.

453 CHOLESTASIS IN THE CEREBRO-HEPATO-RENAL (CHR) SYNDROME: BILE ACID AND MITOCHONDRIAL ABNORMALITIES. Richard K. Mathis, Ira T. Lott, Patricia Szczepanik, and John B. Watkins. Harvard Med. Sch., Mass. Gen. Hosp., and CHMC, Boston; Argonne Nat. Lab., Argonne, Illinois.

Electron microscopic examination of liver and analysis of bile acids were performed in order to examine the mechanism of cholestasis in 2 unrelated infants with CHR syndrome (of Zellweger). They exhibited characteristic facies, camptodactyly, liver enlargement, hypotonia, elevated urinary pipecolic acid concentration in addition to cerebral dysgenesis and renal cortical cysts at necropsy. Liver biopsies performed during a period of jaundice and mild hepatic dysfunction revealed normal intrahepatic bile ducts, hepatocellular cholestasis and no fibrosis. Electron microscopy specifically revealed abnormal, irregularly shaped mitochondria containing a dense matrix; cristae were dilated, irregular and increased in number. Non-sulfated trihydroxy-coprostanic acid (THCA), was identified as the predominant bile acid in bile and urine by GLC-mass spectroscopy. THCA, not found in 10 controls with cholestasis, is an intermediate in bile acid synthesis thought to require mitochondrial oxidation. The coexistence in CHR of mitochondrial abnormalities, cholestasis and accumulation of bile acid intermediates without structural bile duct abnormalities appears to comprise an entity distinct from infants with THCA and bile duct lesions (Hanson et al. JCI 56: 577, 1975). This suggests that in CHR, bile acid feeding may serve to ameliorate hepatic dysfunction and/or elucidate the pathogenesis of disease.

454 BREAST MILK CHOLESTEROL,PHYTOSTEROL,AND TOTAL FAT M.J.Mellies,G.Guy,C.J.Glueck. Gen.Clin.Res.Center,Cin General Hospital, U. Cincinnati,Coll. Medicine.

Breast milk cholesterol(C),total phytosterols(TP), and total fat (TF) were quantitated during the first 12 months of lactation in 8 normals(N) and in a subject homozygous for familial hypercholesterolemia(H-FHC), to assess temporal changes in milk sterol and fat content. The N took an ad-libitum diet, the H-FHC, a low cholesterol($<$100 mg/day),polyunsaturate rich diet(P/S, 2/1). Mean C and TP(mg/g milk total fat),and TF(g/ml) for the N were:

Month	1	2	3	4	5	6	7	8	9	10	11	12
C	3.0	3.8	3.5	5.8	6.9	7.6	7.8	5.8	5.2	7.0	5.4	7.9
TP	.1	2.2	.4	2.3	1.8	1.9	1.1	1.3	1.6	1.9	2.9	1.1
TF	3.3	2.6	3.1	4.0	3.2	3.1	3.9	3.7	4.9	3.0	2.3	3.9

In the H-FHC, mean C,TP, and TF during month 1 were 103,3.3, and 2.3 respectively; in month 2 they were 40, 3, and 3.3; in month 3 they were 52, 2, and 2.7. During lactation in N, breast milk C appears to increase slightly in mo. 4-7. Breast milk TP are variable, but mean TP may be 60% that of C. Breast milk TF was stable,ranging from 2.3 to 4.8 g/ml. In the H-FHC, breast milk TP and TF were comparable to N, but milk C was 10-30 fold higher than N.Although changes in plasma cholesterol(PC) in N are not accompanied by changes in breast milk C, in the H-FHC, (PC$>$600 mg/dl),breast milk is remarkably enriched with C. Since breast milk C is derived from PC and from cholesterolgenesis in the breast, the marked increments in breast milk C in the H-FHC appear to be related to sharp increments in PC with increased extraction of C into breast milk.

455 ONE-HOUR BLOOD-XYLOSE TEST IN THE DIAGNOSIS OF COW'S MILK PROTEIN INTOLERANCE (CMPI). Claude L. Morin, Jean-Paul Buts, Andrée Weber, Claude C. Roy and Pierre Brochu. Hôpital Sainte-Justine, Montréal, Canada.

Our previous observations in 435 children demonstrated that the one-hour blood xylose test is a reliable index of small bowel mucosal function (J. Ped., in press). In this study on CMPI, 11 children (aged 3-24 months) suspected of CMPI and making good progress on a milk-free gluten-containing diet were challenged after 4-10 weeks with whole cow's milk (CM). A base line study in all patients consisted of: 1- one-hour blood xylose test, 2- serum IgE, 3- serum complement (C_3), 4- eosinophilic count, 5- jejunal biopsy for histology and disaccharidase activity. Four to six days after reintroduction of CM, the first four parameters were measured again and a second jejunal biopsy performed in 7 patients. Seven patients reacted clinically to the milk. No significant changes were observed in serum IgE, C_3 complement and eosinophilic count. A significant drop of 51% to 77% in the one-hour blood xylose level was observed in all patients. Mean value (±SEM) for the whole group was 46.1±2.0 mg/dl before and 17.4±1.3 mg/dl following CM. Pre-challenge biopsy specimens for histology and disaccharidase activities were normal in all patients. Histologic changes were observed in the post-challenge biopsies of five patients. Statistically significant decreases in lactase, sucrase and maltase activities occurred after CM. This study suggests that the one-hour blood xylose test is a simple and valuable test in the diagnosis of CMPI.

456 CONTINUOUS NASOGASTRIC INFUSION (CNGI): A SAFE AND EFFECTIVE WAY TO FEED THE VLBW INFANT. Mark A. Pearlman, Jean F. Hobbs, and Lawrence M. Gartner. Albert Einstein College of Medicine, Department of Pediatrics, Rose F. Kennedy Center, Bronx, New York.

CNGI was evaluated as an alternative to transpyloric or intravenous feeding. Forty three consecutive infants weighing less than 1251 grams were fed Similac PM 60/40 24 cal/ounce or breast milk by the intragastric route: 3 by intermittent gavage and 40 by CNGI. Three infants on CNGI died from respiratory disease in the first week of life. Of the remaining 37 infants, 2 developed intermittent non-specific abdominal distension and 35 remained asymptomatic. Mean fluid and caloric intakes of the 35 asymptomatic infants were 132 ± 20 ml/kg/day and 99 ± 20 cal/kg/day on the fifth day of feeding and 166 ± 18 ml/kg/day and 133 ± 19 cal/kg/day on the tenth day of feeding. Thirty one infants gained weight as expected from the Dancis Growth Curves. None of the 37 infants developed necrotizing enterocolitis or aspiration pneumonia. There was no difference in fluid or caloric intake or symptoms between those infants on respirators (n=19) and those not on ventilatory support (n=18). Four infants on respirators failed to grow adequately despite receiving at least 120 cal/kg/day, suggesting an increased caloric requirement rather than a failure in technique. This experience demonstrated that CNGI is an effective and safe method of feeding even the seriously ill VLBW infant; transpyloric and intravenous alimentation are rarely required.