† 632 PROCTOSIGMOIDOSCOPY IN THE EVALUATION OF RECTAL BLEEDING IN NEWBORN INFANTS. T Taxman, B Dahms, F Rothstein, R Kliegman. Case Western Reserve Univ., Dept Peds, Rainbow Babies & Child Hosp., Cleve, OH

51 neonates with rectal bleeding (RB) of unknown etiology were investigated with proctosigmoidoscopy; 44 had rectal biopsy (Bx). The mean birth wt was 3.0kg (1.1-5.0); age at Bx 17.3 (4-28) days. All were fed cow's milk protein formula. Endoscopic abnormalities (END) were graded retrospectively (41) or prospectively (10) and compared to Bx findings, including graded inflammation score (inflam) and criteria of allergic proctitis (eos infiltration and intraepithelial eos [EoIn]). 46/51 had END evidence of colitis, ranging from erythema and edema (mild, 24) friability and ulceration (moderate,16), to spontaneous bleeding and exudation (severe,6). 41/44 Bx had mild to severe colitis and 24/44 met histologic criteria of allergic proctitis. END appearance did not predict the severity of inflam or EoIn on Bx. There was no difference in birth wt, duration of feeds or age of RB in patients with and without moderate to severe inflam. The blood eos count was higher in patients with mod-severe inflam (597 vs 328, $p<0.05$). EoIn was associated with mod-severe inflam ($p<.001$). 10 patients had NEC. Blood eos count, END, and EoIn were not different with and without NEC. RB ceased in all 51 when enteral feeds were stopped; protein hydrolysate or soy formula was given subsequently without RB in 44/44. Conclusions: 1) newborn infants with RB have END and Bx evidence of colitis; 2) END and Bx did not differentiate patients with and without NEC: 3) histologic features diagnostic of allergic colitis are present in half of newborns with RB, suggesting milk protein intolerance is an important cause of neonatal RB.

† 633 INTESTINAL ABSORPTIVE SURFACE AREA IS DETERMINED BY MICROVILLUS NUMBER/CELL, NOT BY MICROVILLUS HEIGHT. Saul Teichberg, Hugo da Costa Ribeiro Jr., Fima Lifshitz. Cornell Univ. Medical Coll., North Shore Univ. Hospital, Departments of Pediatrics and Laboratories, Manhasset, N.Y.

In the small intestine, microvillus (MV) height is usually thought to be directly related to apical absorptive surface area. To evaluate whether MV height or other MV structural features were real indicators of absorptive surface area, we evaluated, by computerized morphometric analysis, the correlation between apical absorptive surface area/cell (AASA) and key MV structural features. These included, MV height, MV No./cell, and the non-MV amplified flat cell surface of rat jejunal (J) and ileal (I) absorptive epithelial cells. We studied 240 cells/region from defined mid and tip villus loci. AASA was defined as flat surface/cell x No. MV/cell x mean MV surface, MV No./cell as MV/u^2 x flat surface/cell and MV surface as u^2/MV. In J, AASA increases from 679 ± 15 u^2/cell to 1085 ± 30 u^2/cell ($p<.01$), between villus mid and tip, and similarly in I. There was a strong positive correlation between AASA and MV No./cell in J and I (J, $r=+.870$, $p<.01$; I, $r= +.889$, $p<.01$), but no correlation between MV height and cell surface area (J, $r=+.290$). And, MV height was indistinguishable at villus mid and tip loci (mid; 1.4 ±.3, tip; 1.6 ±.3 u), despite the increase in AASA . Our data indicate that AASA is dependent on MV No./cell and that MV height is not a measure of AASA, except in cases of severe MV damage. These observations hint that apparently normal sites, in patchy intestinal lesions, may also be compromised.

●634 PROTECTION AGAINST INTESTINAL REPERFUSION INJURY BY DEXAMETHASONE (DM). Vrinda M. Telang, Debra M.Beneck, Branda D. Shrivastava, David A. Clark and Harry S. Dweck, N.Y. Med. Coll., West. Med. Ctr., Div. of Neonatal-Perinatal Medicine, Depts. of Pediatrics and Pathology, Valhalla, New York.

Studies have implicated oxygen radicals in the etiology of necrotizing enterocolitis (NEC). DM, a membrane stabilizer, may protect against oxidant injury of cells. We assessed the role of DM in gut ischemia and reperfusion, which produces experimental NEC. Laparotomy under anesthesia was performed in 16 rabbits. In each, 4 intestinal loops, 5 cm long,were prepared. Only 2 of these loops were rendered ischemic for 5 min., the other 2 loops serving as non-ischemic controls. 8 rabbits were pre-treated with IV DM (0.1 mg/kg); in the other 8, intraluminal (IL) DM (1 mg) was injected into 2 loops while the other 2 were injected with saline (S). The animals were sacrificed 4 hrs. after surgery. All ileal loops were fixed and examined histologically by a single pathologist unaware of group assignment. Histological changes were graded.

	Ischemia			No Ischemia		
	Dexamethasone		Saline	Dexamethasone		Saline
	IV	IL	IL	IV	IL	IL
Necrosis	2	0	7	0	0	0
No Necr.	14	8	1	16	8	8

The non-ischemic loops were normal. DM (IV & IL) was fully protective against reperfusion injury, with two exceptions. These dramatic results suggest that DM may prevent experimental intestinal necrosis.

635 MODEL FOR PROTEIN-LOSING ENTEROPATHY IN THE RAT. Daniel W. Thomas and Kathryn M. McGilligan (Spons. by Stuart E. Siegel), University of Southern California School of Medicine, Childrens Hospital of Los Angeles, Department of Pediatrics, Division of Gastroenterology and Nutrition, Los Angeles, CA.

Measurement of fecal alpha-1-antitrypsin (A1AT) excretion has been demonstrated to be a reliable, non-invasive test for protein-losing enteropathy in humans. The unique biologic properties of A1AT allow it to serve as a natural marker for loss of serum protein into the gut. Our laboratory has recently purified rat A1AT and raised antibody to rat A1AT. The biological and chemical characteristics of human and rat A1AT are very similar. We performed the following initial experiment to establish whether measurement of fecal A1AT also detects intestinal damage in rats. Adult Sprague-Dawley rats were given either a single, intraperitoneal injection of 40mg/kg of bleomycin or an equal volume injection of sterile saline. Bleomycin has known toxic effects upon the gastrointestinal tract. Stools were collected for 5 days following the injection and assayed for A1AT content by rocket immunoelectrophoresis. Mean fecal A1AT±SD (mg/g dry stool) are given below for each day following injection:

	1	2	3	4	5
Bleomycin (N=5)	0.2±0.1	0.1±0.1	0.9±0.7	2.6±0.8	0.8±0.6
Saline (N=5)	0.1±0.6	0.1±0.02	0.1±0.4	0.1±0.4	0.1±0.01
t-Test, p =	0.09	0.13	0.04	0.001	0.03

Our data indicate that intraperitoneal bleomycin resulted in elevated fecal A1AT excretion. Conclusions: 1) fecal A1AT is a useful marker for intestinal damage in rats, and 2) the toxic gastrointestinal effects of various drugs and treatments administered to rats can be monitored by fecal A1AT.

636 ROLE OF ^{99}m-Tc DISIDA IN DUODENAL AND GASTRIC ASPIRATES FOR EVALUATION OF PROLONGED NEONATAL CHOLESTASIS. Vasundhara K. Tolia, Lawrence R. Kuhns, Reuben S. Dubois - Wayne State University, Children's Hospital of Michigan, Departments of Pediatrics and Radiology. Detroit.

Differentiation between intra and extra hepatic causes of neonatal cholestasis can be difficult. Combination of routine hepatobiliary scintigraphy (HBS) after priming with choleretic therapy and closed liver biopsy is 100% effective in confirming the diagnosis. (Tolia, et al. J.Ped.GI and Nutr. 5:30, 1986). In an attempt to improve the accuracy of HBS, similtaneous measurement of the time activity curve (TAC) on the duodenal aspirate(DA) was performed in 9 patients. TAC on DA ranged widely from 151-986,000 cpm/100 ul per mCi dose and was non discriminatory. This may have been secondary to contamination of DA by free ^{99}mTc secreted into the stomach as breakdown of Disofenin® occurs releasing free pertechnetate. A further 24 patients were studied with simultaneous gastric aspirate (GA) and DA. If imaging for gut activity alone is used, extra hepatic biliary atresia (EHBA) was diagnosed in 11/24. Using DA corrected for GA with a cut off point of 1500 cpm/100 ul per mCi dose, then EHBA was diagnosed in 4/24 with two false positives. There was one false negative for EHBA with the DA count being 2741 cpm/100 ul/mCi dose. These data suggest that although additional DA and GA TAC improve the specificity for routine HBS, liver biopsy should still be considered if the cholestasis is not improved within 6 weeks of age.

637 GASTRODUODENAL MOTILITY IN NEONATES: RESPONSE TO HUMAN MILK COMPARED TO COW-MILK FORMULA. T Tomomasa, P E Hyman, K Itoh, JY Hsu, T Koizuimi, Z Itoh, T Kuroume, (sponsored by RD Leake) Dept. of Pediatrics, Gunma University School of Medicine, Japan, and Harbor-UCLA Medical Center, Torrance, CA

It is known that breast milk empties more quickly from the stomach than does cow milk formula. We studied the difference in post-prandial gastroduodenal contractions between neonates fed with human milk and those fed with formula. Twenty-four 5-36 day-old neonates were tested. Changes in luminal pressure in the gastric antrum and duodenum were recorded manometrically for 3 h. In all cases, repetitive, high amplitude non-migrating contractions were the dominant wave form during the post-prandial period. The number of episodes, duration, amplitude, and frequency of non-migrating contractions were not different following the different feedings. Bursts of non-migrating contraction were 4 times more common in the duodenum (6.9±1.6 episodes/h) than in the antrum (1.8±0.9 episodes/h) ($p<0.05$), but an average episode lasted 3 times longer in the antrum (1.6±0.2 min vs 4.1±0.8 min, $p<0.05$). Non-migrating contractions had frequencies identical to those found in phase 3 of the MMC: 3-5/min in the antrum, and 11-13/min in the duodenum. The migrating myoelectric complex, which signals a return to the interdigestive (fasting) state, appeared in 75% of breast milk-fed infants, but in only 17% of formula-fed infants ($p<0.05$). Because contractions were similar following the two meals, but a fasting state recurred more rapidly in breast milk-fed infants, we conclude phasic, non-propagated antroduodenal contractions do not mediate differences in gastric emptying.