● 548 HORMONAL REGULATION OF LIVER PLASMA MEMBRANE PROTEIN EXPRESSION DURING DEVELOPMENT. Yoram Bujanover, Sergio Ammari, Emanuel Lebenthal, James Petrell. State University of New York, Departments of Pediatrics and Biological Sciences, Buffalo.

In the past, dexamethasone and glucagon has been shown to have a variable effect on the expression of soluble liver enzymes during development. The aim of the present study was to investigate the effect of dexamethasone and glucagon on the expression of plasma membrane proteins during ontogeny. Our previous studies have demonstrated a significant increase of the asialoglycoprotein receptor (ASGR) and 110,000 Mr glycoprotein at birth, decrease in alkaline phosphatase (AP) and gamma-glutamyltranspeptidase (GT) and very little change in leucine aminopeptidase (LAP) after birth. Buffalo rat fetuses at 18 days of gestation and 1-day-old newborns were injected (single and daily, respectively) with dexamethasone (2 and 4 µg, respectively) or glucagon (25 and 50 µg, respectively). Fetuses were sacrificed at 22 days of gestation and newborns at 3, 5, and 7 days of age. Total post-nuclei membrane vesicles were prepared from rat livers using a sucrose gradient method. Quantitation of levels of membrane proteins was performed using immunological and/or enzymatic methods. In fetal rats, dexamethasone did not affect the expression of membrane proteins. In contrast, glucagon increased significantly the levels of AP, LAP, and GT. In newborns, glucagon did not alter membrane protein levels. However, dexamethasone dramatically increased six-fold the level of GT while the amounts of ASGR, AP, and LAP were reduced by two- to four-fold. These data indicate that there is a differential effect of dexamethasone and glucagon on the expression of membrane proteins during late intrauterine and early extrauterine stages of development.

549 A MULTIVARIANT ANALYSIS OF THE IMMUNE FUNCTIONS IN CHILDREN AND YOUNG ADULTS WITH IBD. Yoram Bujanover, Gabriel Hauser, Vera Zakut, Zevi Spirer. (Spon. by Emanuel Lebenthal). Sackler School of Medicine, Tel-Aviv Medical Center, Dept. of Pediatrics, Israel.

Previous studies concentrating on single or only few immune functions of patients with inflammatory bowel disease (IBD) have reported conflicting results. The aim of our study was to perform an extensive analysis of the immune system of IBD patients and compare it with normal controls. The study group included: 16 patients with ulcerative colitis (UC), ages 15-42 years (mean 30), 14 with Crohn's disease (CD), ages 10-42 years (mean 22), and 15 healthy individuals ages 9-40 years (mean 29) serving as controls. The IBD patients were categorized as active or nonactive and the treatment was recorded. The specific immunological work-up included: lymphoblast transformation in the presence of CON-A, PHA and pokweed mitogen; T-cells and subgroups of helper and suppressor cells; B and NK cell count; Immunoglobulins C_3 and C_4; Interleukin 2 and NBT test. In addition, each subject underwent five skin tests using mumps, candida, and tuberculin antigens, streptokinase, and saline as control. The results demonstrated in general, a normal immune function in the IBD patients, compared with the controls. Activity of the disease and treatment had no significant effect on the immune function. The statistical analysis of the 44 recorded variables resulted in the following conclusions: 1) CD patients are distinguished from controls by low Hb, total protein, albumin, IgA, and high ESR, platelet count, C_3 and C_4; 2) UC patients are distinguished by low globulin, C_3 and C_4; 3) The main difference between CD and UC were low albumin and high C_4.

† 550 METOCLOPRAMIDE PHARMACODYNAMICS IN INFANTS. Helen L. Butler, Gregory L. Kearns, Susan H. Carchman, Judith K. Lane and George J. Wright, Univ. of Arkansas for Medical Sciences, Departments of Pediatrics and Pharmaceutics, Little Rock, AR and the Department of Drug Metabolism, A.H. Robins Co., Richmond, VA.
(Spon. by Robert H. Fiser, Jr.)

A pilot study of metoclopramide (M) pharmacodynamics (PD) was conducted in 6 infants (0.9-5.4 mo.; 3.2-5.4 kg) with gastroesophageal reflux (GER). M was administered P.O. at a dose of 0.15 mg/kg q6 hr. Esophageal pH was continuously recorded for 24 hr prior to M administration and for 6 hr. following the first (D1) and tenth (D10) dose. Serum M was quantitated by HPLC from repeated blood samples obtained over 24 and 6 hr following D1 and D10, respectively. A significant reduction in the number of GER episodes >5 min. duration was found between the pre-dose (3.33 ± 1.33) and D10 (0.0) evaluations. Similarly, the longest GER epidose with pH <4 was significantly reduced following D10 (1.88 ± 0.71 min) as compared to the pre-dose (18.33 ± 7.82 min.) evaluation. These findings were associated with a Cmax of 56.8 ± 10.5 ng/ml following D10 but were not correlated with the M serum concentration vs. time profile. Significant changes in the time that esophageal pH was <4 and acid clearance were not found when examined as a function of feeding time. Four of six infants showed marked clinical improvement (ie., reduction in choking spells and emesis volume) at the D10 evaluation. No adverse drug effects were noted in any of the infants. M in a dose of 0.15 mg/kg q6 hr appears to be effective in reducing the incidence and severity of GER in infants. This dose deserves further PD and pharmacokinetic evaluation.

● 551 EFFECT OF MALNUTRITION ON ILEAL RESPONSE TO YERSINIA ENTEROCOLITICA (Y.E.) ENTERITIS. J. Decker Butzner, D. Grant Gall. University of Calgary, G.I. Research Unit, Calgary, Alberta, Canada.

The course of Y.E. enteritis was examined in the ileum of control (C) and undernourished (M) 27-28 d old rabbits. Malnutrition was induced by litter expansion 7 d post partum (M,13-16 pups/litter; C,6-8). Animals were infected at 17 or 22 d with 10^9 organisms of Y.E. Weight of M animals at the time of infection was significantly ($p<0.01$) less than C. Undernutrition alone (M) significantly (Table, $p<0.05$) reduced mucosal weight, protein, DNA, lactase and villus height but increased ($p<0.02$) short-circuited glucose-stimulated Na^+ transport ($\Delta glu\ J_{Na}$) compared to C. Infected animals from both dietary groups evaluated at 6 d demonstrated comparable findings. Infected animals with a normal dietary intake at 10 d (I10) showed complete recovery of mucosal weight, protein, DNA, and lactase, morphology and $\Delta glu\ J_{Na}$ compared to C (Table). In contrast, M animals 10 d post infection (MI10) demonstrated persistant mucosal inflammation, increased mucosal weight, protein and DNA and depressed $\Delta glu\ J_{Na}$ compared to noninfected M (Table, $p<0.01$).

Study Group	n	muc.wt. $mg.cm^{-1}$	protein $mg.cm^{-1}$	DNA $mg.cm^{-1}$	Lactase $U.cm^{-1}$	Villus ht. µ	$\Delta glu\ J_{Na}$ µEq/cm/h
C	7	62±5	8.9±0.7	.50±.04	.20±.02	349±15	2.5±.5
I10	9	68±7	9.8±1.0	.56±.05	.15±.03	332±10	1.5±.4
M	10	38±4	5.4±0.5	.29±.02	.13±.02	292±17	5.2±.8
MI10	9	57±5	8.3±0.6	.49±.03	.11±.02	263±20	0.5±.4

We conclude that ileal recovery after a bacteria enteritis in a malnourished host is prolonged as evidenced by persistant inflammation and depressed glucose stimulated Na^+ transport.

552 GASTRIC MOTILITY IN INFANTS WITH GASTROESOPHAGEAL REFLUX (GER). RA Cannon (Spon. by R. Chesney). Department of Pediatrics, University of California, Davis, CA.

Significantly delayed gastric emptying may be seen in 30 - 40% of infants with GER. The mechanism(s) responsible for this abnormality are presently unknown.

Gastric motility was studied in 8 infants (ages: 2-7 mo) with GER and normal (N = 3) or delayed (N = 5) gastric emptying of formula as defined by Tc99m milk scans. Antral and fundal contractions and gastric pacesetter potentials were measured using perfused catheters with intragastric electrodes for 40 - 50 min following a formula meal of 5 cc/kg. Motility indices (MI) were calculated from pressure tracings. Results: 1) In both groups, gastric motor activity was insignificant following a formula meal. 2) Antral and fundal MI (mmHg / sec / 5min) were similar in all patients studied. 3) Gastric pacesetter potentials were observed a frequency of 3 cpm. 4) No gastric dysmotility was documented in either patient group.

Conclusions: In infants with GER, formula is emptied as a liquid meal without significant gastric motor activity. Postprandial gastric motility is similar in patients with normal and delayed emptying; differences in motility patterns do not appear to be a mechanism for the delayed emptying. Other variables, such as position or caloric density of feedings may be more important.

553 A RAT COLONIC RING MODEL TO STUDY H2 AND CH4 PRODUCTION IN VITRO. Edward A. Carter, Ronald G. Barr, W.Allan Walker. Harvard Medical School and McGill University, Massachusetts General Hospital and Children's Hospital and Montreal Children's Hospital, Department of Pediatrics, Boston and Montreal.

Breath H2 and CH4 tests are being developed to assess intraintestinal function, based on the assumption that intestinal bacteria utilize the exogenous substrates to produce these gases. To determine in vitro conditions affecting production in the presence and absence of exogenous substrate, washed isolated rat colonic rings were incubated under N2 at physiologic pH and temperature in closed flasks and the production of H2 and CH4 determined. In the absence of exogenous substrate, negligible (H2<20 ppm, CH4<1 ppm) gas was detected by 1 hour. However, high concentrations (H2>100 ppm, CH4>2 ppm) were detected after 24 hrs of incubation. With the addition of lactose, dramatically increased H2 production occurred at 1 and 24 hrs; CH4 production was only increased by lactose addition after 24 hrs. H2 production occurred at pH 7.0, while CH4 occurred between 4 to 6. The increased production of gases was associated with 10,000 fold increases in bacterial colony counts on the colonic rings and in the media, as well as 200 fold increases in acetate concentration in the media.

Conclusions: These results suggest that gas production in colonic ring preparations is subject to quantitative changes in bacteria, pH and metabolite formation analogous to in vivo conditions. In addition, bacteria firmly attached to colonic tissue appear to utilize colonic mucosa to support their own growth in the absence of exogenous substrate.