

**660** EXACERBATION OF INTESTINAL AMINOACID LOSS BY HYPERTONIC SOLUTIONS DURING IN VIVO PERFUSION OF ZINC DEFICIENT RATS. J. Roberto Moran and Anne D. Lysterly. (Spon. by Jimmy L. Simon). Bowman Gray School of Medicine, Department of Pediatrics. Winston-Salem, North Carolina.

Chronic diarrhea and growth retardation are common expressions of zinc deficiency. One of the reasons for the malnutrition may be increased intestinal loss of nitrogenous compounds induced by the presence of osmotically active compounds intraluminally.

We tested this hypothesis by measuring intestinal loss of a previously injected non-metabolizable aminoacid (<sup>14</sup>C-amino isobutyric acid) in zinc deficient and pair-fed control rats. Jejunum and colon were perfused with either isotonic (300 m Osm/kg) or hypertonic (500 m Osm/kg) solutions using an *in-vivo* single pass perfusion technique. Illustrative results were:

	Jejunum		Colon	
	Isotonic	Hypertonic	Isotonic	Hypertonic
Normal	85 ± 19	304 ± 75*	220 ± 32	323 ± 82
Zinc deficient	218 ± 25*	611 ± 40**	253 ± 37	459 ± 86

Values are dpm/0.01 g wet weight. Mean ± SEM

\* p < 0.05 when compared with isotonic solution.

+ p < 0.05 when compared with zinc deficient animals.

These preliminary results show that there is increased intestinal permeability to aminoacids during zinc deficiency particularly in the jejunum. The repeated episodes of diarrhea observed in zinc deficiency may therefore predispose to depletion of the aminoacid pool and ultimately contribute to growth retardation and malnutrition.

**661** PREALBUMIN AS A MARKER OF FETAL NUTRITIONAL STATUS. Sharon R. Moskowitz, Alan R. Spitzer, and John B. Watkins. Univ. of Penna. School of Medicine, Children's Hospital of Philadelphia, Department of Pediatrics., Philadelphia, PA.

Prealbumin (PA) and retinol-binding protein (RBP), hepatically synthesized transport proteins for vitamin A, are useful markers of nutritional protein/calorie adequacy. To confirm the fetal liver as the source of PA synthesis, we determined PA levels in 9 cord arterial and/or venous sera samples and in paired maternal sera at birth. RESULTS (mean ± SD):

	Prealbumin	Student t Test
Cord Vein (CV) (n=9)	11.2 ± 1.7	CV to CA ns
Cord Artery (CA) (n=8)	11.6 ± 2.1	CA to MAT p < .001
Maternal (MAT) (n=9)	23.6 ± 2.6	CV to MAT p < .001

Prealbumin and RBP concentrations were then determined in maternal and cord sera of 36 preterm and 24 full term AGA infants (32.8 ± 3.3 and 40.3 ± 1.3 wks) to determine the effects of gestational age and maternal levels on cord levels. Maternal PA and RBP were similar for both gestational age groups. Cord levels between the groups were:

	Preterm	Full-term	p
PA (mg/dl)	8.9 ± 2.3	12.0 ± 3.9	p < .00025
RBP (mg/dl)	1.8 ± 0.5	2.3 ± 0.8	p < .005

Two-way ANOVA, with Student-Newman-Keuls test, indicated a significant effect only of gestational age on PA, p=.002, and RBP, p=.01. CONCLUSIONS: 1) PA does not appear to be transferred from mother to fetus during gestation, indicating PA levels in newborns reflect intrauterine fetal hepatic synthesis, not maternal nutrition. 2) Serum PA and RBP increase with gestational age and must be considered when PA is used to evaluate postnatal nutritional status.

**662** EXERCISE-INDUCED GASTROESOPHAGEAL REFLUX. Kathleen J. Motil, Judy Ostendorf, Thomas Vargo, Patricia McVey, Timothy Bricker (Spon/W.J. Klish). Baylor Coll. Med., USDA/ARS Children's Nutr. Res. Ctr., Dept. of Pediatr., Houston, TX.

The effect of exercise on gastroesophageal function was assessed in 7 children who were referred for evaluation of gastroesophageal reflux (GER). Four males and three females whose ages were 12.6 ± 4.4 yr were studied. Three patients presented with exercise-induced gastrointestinal symptoms (nausea, vomiting, substernal or epigastric pain). Cardiac or pulmonary disease was present in 3 children. Maximal treadmill exercise testing using the Bruce protocol with continuous monitoring of electrocardiogram and blood pressure was performed simultaneously with an esophageal pH probe study. Other diagnostic studies included upper GI series, 24-h pH probe, esophageal motility, gastroesophageal endoscopy, and biopsies. Results demonstrated that in one patient with exercise-induced gastrointestinal symptoms, significant symptomatic GER was present throughout strenuous exercise and during recovery (≥40 min); no episodes of pathologic GER occurred throughout 24-h pH probe monitoring by Euler's criteria. Exercise-induced GER also was associated with biopsy-proven esophagitis. Motility studies demonstrated esophageal sphincter competency. None of the other patients demonstrated exercise-induced GER, despite the presence of pathologic GER. Physical work capacity was normal in all children. There were no pathologic ST changes associated with exercise. This is the first report of the association between exercise-induced gastrointestinal symptoms and GER. The pathophysiology of this entity is unknown. Exercise stress testing may aid in the diagnosis of exercise-induced GER.

**663** OXYGEN TENSION CHANGES DUE TO NONNUTRITIVE SUCKING (NNS) DURING OROGASTRIC TUBE FEEDING. John H. Nading, Richard D. Landes (Spon. by Rodney L. Levine). Walter Reed Army Medical Center, Washington, D.C. and Uniformed Services University, Bethesda, MD.

We conducted a prospective, controlled, crossover study to determine if NNS affects oxygen tension in premature infants during orogastric (OG) tube feeding. Conclusion: We found that NNS during OG tube feeding significantly raised oxygen tension. Methods: Premature infants fed by OG tube were evaluated by continuous transcutaneous oxygen tension (TcPO<sub>2</sub>) monitoring during successive feedings. Order of feedings was randomly determined. Each feeding was divided into three periods: 1) baseline (with tube in place), 2) feeding, 3) post feeding (with tube in place). When NNS was provided during feeding it was continued through the post feeding period. All infants were nursed in isolettes on their abdomen with head elevated 15°. Feedings were introduced by gravity. TcPO<sub>2</sub> values were recorded on a paper tracing which was shielded from observation. The state of consciousness was scored every 5 minutes. Statistical analysis was done by paired two-tailed t-test. Results: Eleven infants were studied (6 males, 5 females). Mean birth weight was 1514 grams (range 580-2010). Age at time of study ranged from 2.5 to 101 days. The mean TcPO<sub>2</sub> was 4.6 mmHg higher with NNS than without (p < .05) due to a 3.4 mmHg increase over baseline with NNS versus a 1.2 mmHg decrease from baseline without NNS. These changes could not be explained by differences in activity or skin perfusion, as measured by monitor power output. Although the difference is clearly statistically significant, the clinical application depends upon the baseline PO<sub>2</sub>.

**664** SPECIALIZED NURSES REDUCE INFECTION RATES IN CENTRAL VENOUS PARENTERAL NUTRITION (CVPN). David B. Nelson, Craig L. Kien, Barbara Mohr, Sharon Frank, Starkey D. Davis. Medical College of Wisconsin, Milwaukee Children's Hospital, Department of Pediatrics, Milwaukee, Wisconsin

Although some institutions use a specially trained nurse to change CVPN dressings, the actual effect such an individual has on reducing infection rates and decreasing complications of CVPN has not been proven. During a 9 month period all children receiving CVPN were followed for both mechanical and infectious complications. For 4 months, surgical residents (group R) were responsible for the dressing changes and for the subsequent 5 months, two trained nurses were responsible for dressing changes (group N). The protocol for handling the lines was otherwise the same for the two groups. The two groups were comparable for most known confounding variables. These include primary illness, serum albumin, lymphocyte count, age, race and sex; however, lines from group N were in place longer (t=2.21, p<0.05). In group R, 49% of the lines were removed because of septic or mechanical complications. This rate compared to 20% in group N (χ<sup>2</sup>=6.42, p<0.05). The infection rate alone was also higher in the R group, 31% compared to 3.3% in the N group (χ<sup>2</sup>=8.7, p<0.01); relative risk (RR)=9.3. When patient days on CVPN was used as the denominator, the difference between the groups was greater, 1.42 infections/100 patient days in group R versus 0.11 in the N group (RR=12.9, p<0.01). These data indicate that the utilization of a highly trained individual using meticulous care for all dressing changes is an extremely important factor in lowering infection rates in CVPN lines.

**† 665** THE RELATIONSHIP OF ROTAVIRUS TO ACQUIRED MONOSACCHARIDE INTOLERANCE (AMI) IN YOUNG INFANTS. Veda N. Nichols, J. Kennard Fraley, William J. Klish, Kim Evans, G.S. Gopalakrishna, E. O'Brian Smith, Herbert L. Dupont, and Buford L. Nichols, Baylor College of Medicine, USDA/ARS Children's Nutrition Research Center and Section of Gastroenterology, Department of Pediatrics, Houston, TX.

A prospective study of diarrhea associated with AMI is being conducted in Houston, TX. Infants (n=459) less than 3 mo of age have been enrolled in the study (10-1-80 to 10-1-83). A stool specimen was collected from each patient and tested for rotavirus by Rotazyme®. Forty-six percent of the infants had acute diarrheal syndrome (ADS), (diarrhea < 14 days duration), 45% had chronic diarrhea (CD), (diarrhea > 14 days duration), and 9% had AMI, a form of chronic diarrhea which occurs after feeding any dietary carbohydrate. Mean age at admission (days) was 37 for ADS, 42 for CD, and 31 for AMI. The average duration of acute diarrheal symptoms prior to admission was 3.3 days for ADS, 5.9 for CD, and 5.1 for AMI infants. The weight change (g/d) from birth was 11.9 for ADS, 7.1 for CD, and -1.7 for AMI infants. Rotavirus was detected in the stools of 15% of ADS, 10% of CD, and 30% of the AMI infants. These findings suggest that rotavirus may be associated with the development of monosaccharide intolerance. A chronic state of malnutrition, however, may play a primary role in the development of monosaccharide intolerance.