

**507** COMPARATIVE NUTRIENT COMPOSITION OF HUMAN MILK. D. Anderson, W. Pittard, P. Shulman, F. Mitman, R. Merkatz, D. Kerr, Dept. of Ped & Nutr, CWRU, Cleveland, Ohio.

Reports suggest that women who deliver prematurely produce milk containing a greater concentration (conc) of protein (pro) than those who deliver at term. These studies compare the nutrient content of pooled milk collections from several days or isolated spot collections rather than directly comparing nutrient parameters measured in individual 24hr collections. In this study, to control for variables related to collection method, the 24hr milk production on postpartum days 3, 7 and 14 was analyzed for pro, carbohydrate (CHO), fat and energy (Kcal). Milk was collected from 14 preterm (PT) and 8 term (T) mothers; mean±SD, gestation, 31±1.8 and 39±1 weeks respectively. A similar range of nutrient conc in the

Day	Kcal/dl		Pro gm/dl		Fat gm/dl		CHO gm/dl	
	T	PT	T	PT	T	PT	T	PT
3	57±6	55±10	2.1±.6	2.3±.9	1.9±.5	1.5±.8	6.4±.8	6.0±1.3
7	63±8	70±9	1.5±.2	1.7±.4	3.0±.7	3.7±.8	6.9±.4	6.7±0.5
14	64±5	71±7	1.1±.2	1.4±.3	3.5±.6	4.0±.7	7.1±.2	6.8±0.5

24hr collections was measured in both groups. Direct comparison of the T and PT data at postpartum days 3, 7 and 14 show no significant differences in milk nutrient and/or energy content. The linear regression lines for T and PT data comparing pro vs days postpartum had b=2.32 and 2.28 and m=.09 and .07 respectively. Thus, while the nutrient composition of breast milk may be specifically tailored to the needs of the human infant, these data do not confirm the previous suggestions that its nutrient and energy composition varies significantly with length of pregnancy.

**508** IMPAIRED CHEMOTAXIS RELATED TO ABNORMALITIES OF PMN LEUKOCYTE ADHERENCE IN PROTEIN-CALORIE MALNUTRITION (PCM). D.C. Anderson, G.S. Krishna, & B.L. Nichols, USDA/SEA, Child Nutr & Res Cent, Baylor Coll Med, Houston, Tex.

Serial studies of PMN motility & adherence were performed in 25 children (age 2 mos-14 yrs) with "severe" PCM. Initial assessments demonstrated diminished PMN chemotaxis in 17/20 cases; x migration scores were 64±16% of control (C) to bacterial chemotactic factor (BCF), & 65±21% to zymosan activated sera (ZAS) (p <.001). Chemotaxis to ZAS was further diminished when PMNs were suspended in "severe" autologous plasma (54±14% of C). In subsequent studies in 14 nutritionally "restored" pts (x wt/ht=27th %ile & x serum pre-albumin=25 mg/dl), chemotactic responses were 87±14% (BCF) & 94±14% (ZAS) of C while decreased scores were constant in pts not achieving nutritional recovery. Abnormalities of PMN adherence to albumin-coated glass substrates were concurrently identified; baseline PMN adherence values were significantly (p<.001) increased in "severe" PCM (49±8%) compared to normal C values (21±11%) or respective "nutritionally restored" values (20±12%). Also, x chemotactic factor (CF) induced adherence increments (above baseline) as seen with C PMNs (BCF, +31±14%, f-Met-Leu-Phe, +34±14%) were not observed in "severe" PCM (BCF, +0.84±14%; f-Met-Leu-Phe, -0.2±20%) (p<.001). In contrast, normal CF-adherence increments were observed in respective PCM pts following nutritional recovery (BCF, +25±9%; f-Met-Leu-Phe, +23±11%). ∴, impaired chemotaxis in PCM is related to intrinsic abnormalities of PMN adherence or CF effects on adhesive function, & the presence of a cell directed inhibitor of motility in PCM plasma.

**509** DEVELOPING FUNCTIONAL LACTASE SUFFICIENCY IN THE FIRST FIVE MONTHS. R.G. Barr, (Spon. by K.N. Drummond), McGill Univ., Montreal Children's Hospital, Department of Pediatrics, Montreal.

Incomplete absorption of lactose in response to usual feeding (functional lactase insufficiency) is a common phenomenon in the first week of life (Douwes et al Arch Dis Child 55: 512, 1980). To determine the duration of this phenomenon, sequential studies of breath hydrogen (H<sub>2</sub>) excretion were performed in 16 normal infants over the first five months. Using interval sampling by modified nasal prong, H<sub>2</sub> concentration in expired breath was measured over 4 hours (9:30 am-1:30 pm) at approx. 2 week intervals on 4-9 (mean 6) home visits (total 98). Two infants produced no H<sub>2</sub>, due to absence of H<sub>2</sub>-producing bacteria confirmed by *in vitro* stool testing. In the others, mean H<sub>2</sub> concentration in parts per million (ppm) was calculated for 4-hour average, peak, and pre-feed values at 2-week intervals. Mean values were highest for 4-hour average (26 ppm), peak (54 ppm), and pre-feed (32 ppm) measures at 8, 8, and 4 weeks respectively, and dropped to 10 ppm by 12 weeks for all measures. Maximum values were obtained before 8 weeks by 12 of 14 infants, and were significantly elevated over highest values obtained after 8 weeks for all measures (paired t tests: all p<.02). All infants grew normally between 10th and 90th percentiles throughout. **Conclusion:** In response to usual feeding patterns, most normal infants demonstrate maximum functional lactase insufficiency by 8 weeks of life, with increasing sufficiency thereafter. Incomplete lactose absorption is a normal phenomenon in the first few months of life.

**510** AUTONOMIC NERVOUS SYSTEM (ANS) REACTIVITY IN RECURRENT ABDOMINAL PAIN (RAP) SYNDROME. R.G. Barr, M. Feuerstein, T.E. Francoeur, and M. Westwood (Spon. by K.N. Drummond), McGill Univ., Montreal Children's Hosp., Dept. of Pediatrics and Dept. of Psychology, Montreal.

Previous reports (Rubin et al 1967, Apley et al 1971) argue that a deficit in ANS response may act as a psychophysiological mechanism in RAP syndrome. Since this deficit is seen only on recovery from autonomic arousal as measured by pupillary response, we evaluated how general this deficit was by examining autonomic, somatic and subjective reactivity to acute stress. Digital blood volume pulse (DBVP), heart rate (HR), forearm electromyography (EMG), distress and pain responses were measured to cold pressor (hand immersion x 1 min. at 0±10°C) in children with RAP (n=10; 9-14 yrs), hospital (n=9) and healthy (n=10) controls matched for age, sex, ethnicity, and SES. Differences were assessed across time periods (baseline vs stress vs recovery) and groups by repeated measures ANOVA. For physiologic measures, significant DBVP constriction, HR acceleration, and EMG increases occurred during stress (all p<.001), but no differences or trends occurred among groups (all p>.05). Detailed analysis of recovery from stress demonstrated no group differences (all p>.05) or trends. For subjective ratings, all groups reported increased distress; however, no group differences were observed. Similarly, no group differences in pain ratings were observed. **Conclusion:** Contrary to previous reports, children with RAP display normal physiologic arousal as well as subjective response to a stress/pain stimulus. Important etiologic factors may be found in other aspects of the disorder.

**511** ABDOMINAL DISTENTION FOLLOWING FEEDING OF HIGH DENSITY CALORIC FORMULA IN THE LOW BIRTH WEIGHT (LBW) INFANT. Raul C. Banagale (Spon. by A. P. Erenberg), Dept. of Ped., Univ. of Iowa Hospitals and Clinics, Iowa City, IA and Dept. of Ped., Iowa Methodist Medical Center (I.M.M.C.), Des Moines, IA.

Fifth-four LBW infants who received Similac 24 LBW formula within the first 6 mos. of its introduction at I.M.M.C. were studied. Abdominal distention (AD) was noted in 27 infants. Regurgitation (3/27), significant gastric residuals (5/27), and occult blood in the stools (8/27) were noted as accompanying signs. Infants who developed AD (29.6 ± 3.1 wks) were 2.2 wks more premature (p<0.01) than those who did not (31.8 ± 3.0 wks). Those who developed AD (1271 ± 415 g) were smaller (p<.05) than those who did not (1524 ± 532 g). Abdominal roentgenograms of infants who developed AD failed to demonstrate lacto bezoar. The table shows feeding mode (FM) and incidence of AD.

FM	AD-YES	AD-NO	TOTAL	%YES
Continuous (CF)	20	18	38	53
Gavage (GF)	4	8	12	33
Bottle (BF)	0	4	4	0

AD seems to be related to FM (p<0.05). However, to say that FM causes a difference in the incidence of AD requires random assignment of patients to FM which is difficult for ethical and medical reasons. The preferred initial FM of non-distressed LBW infants at I.M.M.C. is CF. When CF is tolerated at 80-100 ml/kg/day, the FM is changed to GF, then, depending on the infant's coordination of sucking and swallowing, BF is introduced.

**512** FLEXIBLE FIBEROPTIC COLONOSCOPY IN CHILDREN. Glen N. Barclay and Marvin E. Ament, UCLA Medical Center, Department of Pediatrics, Los Angeles

Reports of extensive experience with colonoscopy in childhood are limited. We undertook a review of 80 flexible fiberoptic colonoscopies performed on 63 pediatric patients age 2 months-20 years (mean 10.6 years) between 1972 and 1980. Instruments included Olympus TCF-21, CF-ITS, CFLB-3R, P2 and prototype pediatric colonoscopes. General anesthesia was required in 4. All others were done after sedation with diazepam (mean dose 0.79 mg/kg<sup>-1</sup>) and meperidine (mean dose 2.56 mg/kg<sup>-1</sup>). Children 10 or less (N=30) required twice the sedative dose per kilogram of those >10. Indications for colonoscopy were obscure rectal bleeding in 29, assessment and surveillance of inflammatory bowel disease in 27 and suspected mass lesion in 23. Colonoscopy was essential for diagnostic confirmation in 14 of 29 cases of obscure rectal bleeding. Barium enema with proctoscopy would have missed the true extent of inflammatory bowel disease in 8 of 21 patients.

Comparison of findings on colonoscopy with barium enema in 44 patients showed agreement in 29, colonoscopic superiority in 13 and barium enema superiority in 2. The right colon was reached in 74% of diagnostic procedures. Four of the 16 patients with juvenile polyps had evidence of bleeding sufficient to cause anemia. Five minor complications (bleeding not requiring transfusion, mild fever and urticarial reaction to sedative) were recorded and no major complications were seen. **Conclusions:** are that colonoscopy may be done safely with minimal anesthetic risk in childhood; polypectomy is feasible at any colonic site for histologic confirmation and prevention of chronic blood loss; colonoscopy is a more sensitive diagnostic tool than barium enema alone in obscure rectal bleeding and inflammatory bowel disease and flexible instruments have considerable advantages over rigid instruments and should be used more widely.