

457 PROTEIN UTILIZATION OF LOW BIRTH WEIGHT NEONATES. Paul Pencharz, Marie Degranges, Michel Masson, Apostolos Papageorgiou (Spon. by H.J. Guyda) Montreal Children's Hospital, Montreal, Quebec

The ability of low birth weight neonates to utilize protein, in a milk based formulae (MILK) with or without added medium chain triglyceride oil (MCT), was studied; MCT was added to a level of 40% of the fat content. 58 balances in 33 babies were performed. Babies were divided into 4 groups based on birth weight (above and below 1500g) and intrauterine nutritional status, and randomly allocated to either diet group. MILK fed babies ingested more protein (5.26g); MCT group (4.28g/kg/day) ($p < 0.01$) although energy intakes were similar; MILK-145kcal; MCT-156kcal/kg/day. There was a significant correlation between N-intake and retention ($r = 0.83$, $p < 0.001$) in all babies; no correlation was found between N-retention and energy intake. Neither nutritional status nor the addition of MCT had any significant effect on weight gain, N-absorption, retention or utilization. However infants with birth weights $< 1500g$ absorbed protein less efficiently; 89.7% ($< 1500g$), 92.3% ($> 1500g$) ($p < 0.01$). These smaller babies effectively conserved nitrogen, once absorbed; 73.6% ($< 1500g$), 68.0% ($> 1500g$) ($p < 0.05$). Net protein utilization (NPU) then, was not significantly different; 66.0% ($< 1500g$); 62.9% ($> 1500g$); and compares with adults (NPU-61%) on egg protein (0.4g/kg/day) (J. Nutr. 103:1164, 1973)

458 NONINVASIVE DIAGNOSIS OF SUCROSE INTOLERANCE IN CHILDHOOD BY INTERVAL BREATH HYDROGEN DETERMINATION. Jay A. Perman, Ronald G. Barr and John B. Watkins (Spon. by Richard J. Grand) Harvard Medical School and Children's Hosp. Med. Ctr., Dept. of Pediatrics, Boston.

Elevated breath hydrogen levels resulting from colonic bacterial fermentation of nonabsorbed carbohydrate identifies disaccharidase deficiency in adults. This principle was validated in children with sucrose intolerance by interval breath sampling using a nasal prong, thus permitting simple, noninvasive collection of expired air for H_2 analysis by gas chromatography. Six symptomatic children (ages 6-11 yrs) with congenital sucrose intolerance (4 proven sucrose deficient by jejunal biopsy and 2 sibs) were compared with 6 normal controls (ages 5-8 yrs) and 2 children with biopsy-proven acquired sucrose deficiency now clinically well (ages 3 and 10). Expired air was collected before and at 30, 60, 90, 120 and 180 min after orally administered sucrose (2 gm/kg; max 50 gm). Peak H_2 excretion was significantly elevated in sucrose intolerant patients: 114 ± 63 (mean \pm S.D.) parts per million above baseline (A ppm), versus 2 ± 2 A ppm ($p < 0.001$) in controls and patients who had recovered. Best discrimination occurred at 90 minutes post-ingestion (range 28-203 vs. 0-3 A ppm).

Breath H_2 determination provides a sensitive, reliable means for detection of sucrose malabsorption. The nasal prong technique permits convenient application of this methodology to young children, and offers the opportunity to screen, diagnose, and evaluate therapy for malabsorption of specific carbohydrates in the pediatric age group.

459 CELLULAR AND ELECTROLYTE CHANGES IN HUMAN BREASTMILK WITH LACTATION. W.B. Pittard, III, D.A. Clark, CWRU School of Medicine, Dept. of Peds, Cleveland, Ohio (Spon. by A. Fanaroff)

Recent interest in breastfeeding has refocused attention on the changing composition of human milk. To measure its cellular and electrolyte concentration over time, we obtained fresh milk from 68 healthy breastfeeding mothers on the 1st through 10th post-partum day. Breastmilk cells were separated via centrifugation, counted, and differentiated using a myeloperoxidase stain. Na^+ and K^+ concentrations were measured by flame photometer. The day of lactation correlated significantly with macrophage and neutrophil concentration and Na^+ content. The macrophage content decreased from 2.5×10^6 to 1.0×10^6 /ml milk over the 1st week post-partum, while neutrophil content decreased from $.5 \times 10^6$ to $.1 \times 10^6$ /ml milk. Mean Na^+ concentration decreased from 28 to 9 mEq/liter over 10 days, but a plateau lasting several days was found early in lactation. Throughout the 1st 10 days, the lymphocyte and K^+ concentration remained relatively constant at 1×10^6 lymphocytes/ml and 17 mEq/liter respectively. No significant correlation was observed between the concentration of Na^+ or K^+ or any of the 3 cell types with respect to maternal age, parity, medication or mode of delivery. However, when conduction anesthesia was employed, the milk lymphocyte concentration was related to mode of delivery with mothers delivered vaginally having a greater ($p < .04$) milk lymphocyte content than those delivered by cesarean section. These observations suggest that multiple mechanisms must operate over time to control the composition of human milk.

460 ASSOCIATION OF A VARIANT LIPASE IN HUMAN MILK WITH PROLONGED NEONATAL JAUNDICE. Ronald L. Poland, Gary E. Schultz and Gayatri Garg, Wayne State Univ., Depts. of Pediatrics and Anthropology and the Children's Hospital of Michigan, Detroit.

Human milk samples that inhibit bilirubin-UDP-glucuronyl transferase activity *in vitro* have been associated with prolonged unconjugated hyperbilirubinemia in newborn infants. 1/178 milk samples collected at random inhibited the enzyme as compared to 7/15 suspected samples. The non-esterified fatty acid (NEFA) content of five inhibitory milks (27.6 ± 4.9 mM) differed from control samples (12.3 ± 5.5 mM, $p < 0.05$). This is in agreement with Bevan and Holton (Clin Chim Acta, 1972). The concentration of each fatty acid measured by GLC was higher in inhibitory milks. The lipase activity of 124 milk samples collected from volunteers on day 3 or 4 of lactation (control group) was compared with that of 8 samples from mothers of infants with prolonged unconjugated hyperbilirubinemia (jaundiced group). The lipase assays were performed in duplicate using tributyrin as substrate with and without sodium taurocholate (TC) in the incubation mixture. Results as follows:

LIPASE mM/ml.min	A:with TC	B:without TC	C:A/B ratio
Control	74.4 ± 2.9	5.9 ± 0.2	12.9 ± 0.3
Jaundice	100.4 ± 9.5	12.1 ± 0.8	8.6 ± 1.0
	$p < .03$	$p < .0001$	$p < .003$

Agarose gel electrophoresis of milk proteins showed a difference in mobility between lipases from normal and abnormal milk. Thus, a lipase with abnormally high activity and variant electrophoretic mobility appears to be the cause of increased concentrations of NEFA in the abnormal breast milks.

461 EFFECTS OF EXOGENOUS INSULIN ON GLUCOSE DISPOSAL OF LOW BIRTH WEIGHT (LBW) INFANTS. A. Pollak, R. Cowett, R. Schwartz, and W. Oh. Brown Univ. Program in Med., Women and Infants Hosp., Dept. of Ped., Providence, R.I.

Hyperglycemia is one of the complications of parenteral administration in LBW infants. The effectiveness of insulin administration to improve glucose disposal was evaluated in 7 infants (mean b.w. 1100 gms., mean gestation 29 wks) at age 5-14 days. At midpoint during a 4 hr constant glucose infusion (14 mg/Kg/min), a placebo (0.9% saline) was given (control); the next day, insulin (10 mU/Kg/min for 50 min) replaced the placebo (experimental)

Time (min)	CONTROL (mean \pm S.E.M.)			EXPERIMENTAL (mean \pm S.E.M.)		
	G (mg/dl)	I (μ U/ml)	G/I	G (mg/dl)	I (μ U/ml)	G/I
0	126 ± 8	30.0 ± 4.6	4.7 ± 0.6	115 ± 12	25.7 ± 4.5	5.2 ± 0.7
30	$150 \pm 11^*$			$151 \pm 9^*$		
60	$179 \pm 11^*$			$177 \pm 7^*$		
90	$179 \pm 14^*$			$188 \pm 17^*$		
120	$170 \pm 16^*$	50.4 ± 10.7	4.9 ± 1.5	$200 \pm 20^*$	$56.3 \pm 10.7^*$	4.5 ± 1.1
150	$163 \pm 21^*$			157 ± 26		
180	$173 \pm 18^*$			125 ± 28		
240	$195 \pm 24^*$	$50.2 \pm 6.5^*$	4.1 ± 0.6	107 ± 27	$70.9 \pm 9.2^*$	$1.7 \pm 0.5^*$

*significant difference compared to baseline (0)

Plasma insulin (I) increased during glucose infusion induced hyperglycemia. Exogenous insulin results in further increase in I with significant fall in plasma glucose (G) and glucose insulin ratio (G/I). G remained normal 2 hours following conclusion of the 4 hr study. Hyperglycemia in LBW infants can be abolished by insulin treatment allowing 20 gm/Kg/day of glucose intake as a caloric source.

462 PATIENT ATTITUDES ABOUT WEIGHT GAIN DURING PREGNANCY. J. Pomerance, S. Kagal, A. Allen, P. Brooks, M. Margolin, Cedars-Sinai Medical Center, Dept. Ped. and Ob. Gyn. and UCLA Sch. Med., Los Angeles (Spon. by B. M. Kagan).

Recently recommendations for weight gain during pregnancy have been liberalized. One hundred ninety-five pregnant patients (96 private, 99 clinic) were asked to complete a questionnaire designed to elicit their attitudes about weight gain during pregnancy. "No response" is not listed below, therefore totals may be $< 100\%$.

	Private	Clinic
1. How much weight do you think you should gain during pregnancy?		
<10 lbs	6%	8%
10-20 lbs	24%	36%
21-30 lbs	64%	40%
>30 lbs	2%	5%
2. Do you ever diet immediately before your OB appointment?		
yes	10%	6%
no	90%	91%
3. Would your doctor be upset by too little weight gain?		
yes	46%	32%
no	47%	62%
4. Would your doctor be upset by too much weight gain?		
yes	93%	84%
no	3%	11%

The results of this questionnaire seem to indicate that many women and/or their doctors are still ignorant of current concepts of proper nutrition during pregnancy. The medical profession will need to place increased emphasis on education in this area.