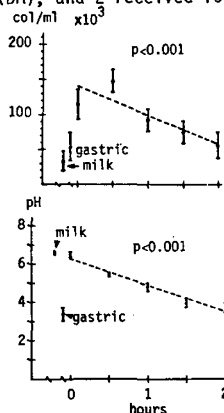


745

IS THE CONCEPT OF A "SAFE" BACTERIAL COUNT FOR RAW HUMAN MILK ACADEMIC? Anna Urowicz, Susan Dab, Janet Emery, and June P. Brady. Dept. Neonatology, Children's Hospital of San Francisco.

To determine the fate of bacteria in human milk, we obtained serial cultures of gastric contents in 20 well preterm infants (BW:1200±91g, GA:29±1 wk, age:27±4 days, mean±SE). Eleven infants received fresh frozen maternal milk (FMM), 7 received donor milk (DM), and 2 received formula (F). Using sterile technique, samples were obtained via a gastric tube for colony count and identification before, and at 0, 0.5, 1, 1.5, and 2 hrs after a feeding. pH was tested with Hydriion tape. Three of 11 FMM, 6 of 7 DM, and both F samples were sterile, the rest were contaminated with skin bacteria (1-290 x 10<sup>3</sup>/ml). At time 0, 12 of 23 gastric samples were sterile, 4 grew skin bacteria, 7, pathogens, and 4, Candida. Bacterial growth was related to time and pH (Fig). No bacteria grew if pH was <3.5 but Candida growth was unaffected by pH. Our findings indicate that the ability to generate an acid pH is an important factor in the preterm infant's ability to suppress bacterial growth and that the debate about a "safe" bacterial count for raw human milk for the well preterm infant may indeed be academic.



748

INDICATIONS FOR AND OUTCOME OF 90 PEDIATRIC PATIENTS ON LONG TERM HOME PARENTERAL NUTRITION (HTPN). Jorge Vargas, William E Berquist, Marvin E Ament. Department of Pediatrics, UCLA Medical Center, Los Angeles, California.

The records of pts on HTPN during the past decade (63,490 pt-therapy-days) were reviewed to determine frequency of diagnoses, duration of therapy, morbidity and mortality related to the technique. Diagnostic categories were: Short Bowel Syndrome in 28 pts (31%); Inflammatory Bowel Disease (20%); Malignancies (10%); Intractable Diarrhea of Infancy (10%); Idiopathic Intestinal Pseudo-obstruction (9%) and Miscellaneous Diagnoses (20%). 42% were under 1 year of age; 62% under 3 and 30% above 12 years when TPN was started. The youngest pt at time of discharge was 3 1/2 months and the lowest weight at discharge was 3.1 Kg. The mean duration of therapy was 737 days (r=23-2850). 14 pts have been on HTPN for over 4 years and 7 for over 6 years. 29 pts died during the course of HTPN; however, only 10% (9/90) of these were TPN related. Catheter related sepsis was the cause of death in 6.18 pts are still on full or partial HTPN support, with 50% at or above the 50th percentile for weight for age, and above the 25th percentile for height. Those of school age (7/8) attend regular schools. 41 no longer require TPN. They are doing well on regular diets or with oral supplements, and 75% are at or above the 25th percentile for weight and height for age. HTPN is a safe and lifesaving technique for children who cannot solely satisfy their nutritional needs via the enteral route. Although sepsis is the greatest source of mortality, long term therapy can be done safely for years, free of infection, while the patient's intestine adapts or heals, remission is obtained or until other therapies are developed for the diseases which make HTPN necessary.

746

EFFECT OF MEDIUM-CHAIN-TRIGLYCERIDE (MCT) DIET ON ENERGY AND MACRONUTRIENT UTILISATION IN THE VERY-LOW-BIRTHWEIGHT (VLBW) INFANT. J. Van Aerde, P. Sauer, T. Heim, J. Smith, M. McVey, P. Swyer. Depts. Paeds. & Eng; Univ. Toronto, Res. Inst., Hospital Sick Children, Toronto, Canada.

In order to determine the efficiency of MCT diet to simulate the intrauterine growth rate and body composition, we studied 8 VLBW infants and compared them with the fetus of the same postconceptional age. Sixteen studies, combining open-circuit indirect calorimetry, anthropometry and macronutrient balance were performed on 8 growing VLBW infants (x±S.E.: BW 1106±35 g; Gest age 29±0.5 wks; study weight 1417±66 g; age 26±3.4 d).

RESULTS: (x±S.E.)	Energy (g/kg.d)	Protein (g/kg.d)	CHO (g/kg.d)	Fat (g/kg.d)
Intake	124.0±1.05	3.07±0.04	12.30±0.15	6.31±0.08
Losses	6.2±0.51	0.291±0.02	0.074±0.006	0.394±0.05
Oxidation	57.0±1.58	0.45±0.03	10.28±0.59	1.54±0.24
Storage	60.8±2.09	2.37±0.06	2.01±0.49	4.36±0.26

Weight (16.42±0.96 g/kg.d) and length (1.25±0.07 cm/wk) gain were similar to those of the fetus (wt: 13.9 g/kg.d; length 1.24 cm/wk). The accretion rate of protein was 20% higher than that of the fetus, fat accretion was twice as high. CONCLUSIONS: (1) An MCT containing diet induces a higher protein accretion than observed during intrauterine development, and is accompanied by a concomitant increase in fat deposition and reduced body fluid content. (2) An increase in lean body mass greater than found in the fetus has been demonstrated for the first time in the VLBW infant. Thus, feeding an MCT formula might open new perspectives for studying dietary effect on "quality growth" of the low birthweight infant.

749

CATHETER RELATED INFECTIONS IN LONG TERM HOME PARENTERAL NUTRITION (HTPN): A 174 PATIENTS-YEARS EXPERIENCE. Jorge Vargas, William E Berquist, Marvin E Ament, Department of Pediatrics, UCLA Medical Center, Los Angeles

The medical records of 90 pediatric pts on HTPN during 1976-1984 (63,490 pt days) were analyzed to determine the type, incidence, source and complications of catheter infections. There were 99 episodes of confirmed catheter infections (1/641 therapy days), 19 at the catheter insertion site. 42 pts accounted for the 99 episodes of infection; 18 were infected once and 9 pts had 45 episodes (4-6 each). Organisms responsible were: S. aureus (38%); S. epidermitis (30%); Candida spp. (11%); P. aeruginosa (9%); E. coli (6%); Gp. D Streptococcus; Klebsiella; S. viridans and Ptyrosporium Orbicularis. Positive catheter blood cultures were obtained 80% of the time in suspected sepsis and half of these had simultaneous positive peripheral blood cultures. Catheter related sepsis (staphylococcal) was the cause of death in 6 cases. 47 pts were never infected and the duration of therapy was comparable to that of the infected group. The catheter was removed in 70/76 episodes of infection prior to 1981 when catheters were systematically removed when infected, mostly due to S. aureus, gram negatives and fungal. Subsequently, 23/29 infectious episodes were treated successfully as outpatients for 4-6 weeks, following induction of antibiotic therapy as inpatients; 28/29 were staphylococcal infections. No correlation was found between initial diagnosis, age or catheter site and incidence of infection. In one pt the source of infection was a contaminated solution. Catheter sepsis is a complication which occurs often in a few pts, occasionally in others and never in some. Staphylococcal infections may, in many instances, be eradicated without catheter removal.

747

FAT OXIDATION IN PARENTERALLY FED NEWBORN INFANTS. J. Van Aerde, P. Sauer, J. Smith, D. Wesson, P. Swyer, P. Pencharz, Depts. Paed., Med. Eng. & Surg., Univ. Toronto; Res. Inst., Hosp. Sick Children, Toronto, Canada.

Fat oxidation (FO) has previously been measured by indirect calorimetry (IDC). Due to conversion of glucose into lipid, true fat oxidation may be underestimated. In the present study, we combined IDC with direct measurement of glucose oxidation using U-13C-glucose. IDC was performed for 5 hrs. Simultaneously a primed constant infusion of U-13C-glucose was given. Glucose utilisation was calculated separately from IDC data (ie. protein free RQ + VO<sub>2</sub>), and from 13CO<sub>2</sub> enrichment in breath at plateau. Fat oxidation was then calculated by subtracting the glucose utilisation from the non-protein metabolic rate. Ten AGA parenterally fed infants were studied (x±S.E.) BW 2.7±0.33 kg, gest. age 36.6±1.4 wk, study weight 2.7±0.31 kg, age 14.2±2.8 d, energy intake 86.2±2.35 Kcal/kg.d, protein intake 2.8±0.09 g/kg.d.

	Intake (g/kg.d)		Utilisation (g/kg.d)	
	glucose	fat	glucose	fat
IDC	13.99±0.44	2.04±0.17	8.73±0.30*	0.84±0.19*
13C-glu			6.02±0.38*	1.93±0.20*

\*p<0.001

CONCLUSIONS: Due to lipogenesis, IDC overestimates glucose utilisation and hence underestimates fat oxidation. By measuring glucose utilisation directly, we have been able to demonstrate a significantly higher fat oxidation, approximately 90% of intake.

750

WATER AND ELECTROLYTE ABSORPTION IN MALNUTRITION: EFFECT OF LACTOSE AND REVERSAL BY GLUCOSE. Raul A. Wapnir and Joshua A. Beckman (Spon. by F. Lifshitz). N. Shore Univ. Hosp. and Cornell Univ. Med. Col., Dept. of Pedcs. Manhasset, NY.

Unhydrolyzed lactose (Lac) is known to reduce normal H<sub>2</sub>O and Na absorption by the gut. In this study we investigated the effects of Lac without or with added glucose (Glu) on the jejunal absorption of H<sub>2</sub>O, Na and K in mal-(M) and well-(C) nourished rats. Protein-energy malnutrition (PEM) was induced in juvenile rats by feedings of 4% protein and reduced carbohydrate. C rats received a complete diet. Absorption was studied by one-pass perfusions of 20-30 cm segments with sols. containing 60 mM Lac (I) or 60 mM Lac + 50 mM Glu (II). Both sols. included (in mEq/l): 30 Na, 20 K and 30 HCO<sub>3</sub>. Phenol red and H<sub>2</sub>O were used as markers. The net H<sub>2</sub>O flux (NWF) was the same in M and C rats with I (C= 1.81±0.09; M= 1.87±0.10 µl/min x cm), but when Glu was present (II) the improvement of NWF was greater in M rats (C= 2.52±0.11; M= 5.66±0.23, P<0.001). This effect of Glu was mostly due to a greatly diminished efflux (C= 4.85±0.26; M= 0.18±0.24, P<0.001) in rats with PEM. Na transport was changed from secretion to absorption by Glu in M rats (C= 2.9±14.8; M= 285.0±13.7 nEq/min x cm, P<0.001), while Lac only produced secretion in both groups (C= -5.9±0.9; M= -28.0±8.3). K absorption was greater in M rats regardless of the presence of Glu. The data suggest that in PEM a more significant improvement over the negative effects of unhydrolyzed Lac on H<sub>2</sub>O and electrolyte transport can be achieved by the addition of a moderate amount of Glu to a feeding formula.