▶ 709 Use of Superoxygenated Intraluminal Fluorocarbons in the Treatment of Experimental Intestinal Ischemia

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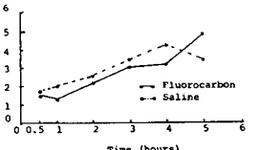
Direct amelioration of intestinal ischemia using an inert intraluminal oxygen carrier is an appealing concept. The perfluorocarbons are biologically inert substances known to reversibly bind oxygen such that passive local delivery of oxygen to tissues is theoretically feasible. 75-100 gram weanling male Sprague-Dawley rats (n=46) were divided into timed study groups from 0.5 to 5 hours. All underwent laparotomy with identical complete devascularization of two adjacent 5 cm segments of terminal ileum. Each intestinal segment was treated with a single intraoperative instillation of either; superoxygenated FC-43 (initial $pO_2$596) or physiologic saline. Timed sacrifice was performed and tissue taken for light and electron microscopy. Blinded histologic evaluation was performed in triplicate using a scoring system to quantitate the ischemic injury. (0= normal to 6= full thickness necrosis).



The fluorocarbon treatment group has a significantly ($p<.01$) lower histologic score than the saline treated controls at comparable time points; indicating a cytoprotective effect in the treatment group. (Wilcoxian sign rank test). The utility of this preliminary observation will require further laboratory and clinical experience.

● 710 INTRACTABLE DIARRHEA OF INFANCY (IDI): prospective, randomized study of enteral vs. parenteral therapy.

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13 infants with IDI (age 29-134 days, diarrhea duration 15-49 days, weight below birthweight in 9/13, and 1 hr serum D-xylose 4.8-13.1 mg/dl) had malabsorption catagorized as "severe" (S, D-xylose ≤10) or "moderate" (M, D-xylose >10). S were randomly assigned to parenteral (TPN) or continuous nasogastric elemental enteral (ENT) therapy; M to ENT or oral bolus elemental (ORL) therapy. ENT and ORL were allowed intravenous stool volume replacement with 10% dextrose solution.

Results:	(#)	INITIAL WT. (KG. <5%ile)	DAYS TO WT. =5%ile	WKS. TO D-XYL>15	DAYS ENT pre-DSCHG.	DAYS TO DISCHARGE
S:	TPN(4)	.5 (.1-1.0)	43 (12-90)	7 (2-13)	23 (12-31)	73 (47-86)
	ENT(4)	.4 (0-1.0)	43 (0-75)	2 (2- 5)	21 (16-24)	21 (16-36)
M:	ENT(2)	.8 (=.2-1.7)	----	1 (1- 1)	15 (15-15)	15 (15-15)
	ORL(3)	.2 (=.5- .5)	----	1 (1- 1)	17 (4-24)	17 (4-24)

All TPN patients failed to normalize D-xylose absorption after 39 (35-51) days of TPN, so were switched to ENT. The preceding TPN did not shorten their ENT, nor significantly speed their growth, compared with the S ENT group. One S ENT patient continued to lose weight after 1 week of enteral therapy, so was switched per protocol to TPN; however, central line sepsis 4 days later forced his (successful) return to ENT. No problems or detectable differences between ENT and ORL occurred in the M patients.

Conclusion: Enteral therapy of IDI can produce comparable correction of malnutrition to TPN, with better correction of malabsorption, shorter hospitalization, and fewer complications.

● 711 SECRETORY DIARRHEA WITH PROTEIN-LOSING ENTEROPATHY, COLITIS CYSTICA SUPERFICIALIS AND CONGENITAL HEPATIC FIBROSIS: A NEW SYNDROME.

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Four infants presented with intractable diarrhea, vomiting, edema, hepatomegaly and hypoglycemia within the first three months of life. Their parents originated from the Northeastern part of Quebec but consanguinity was only found in the fourth generation of two kindreds. Diarrhea was profuse (60-100 ml/kg/day) despite discontinuation of oral feeding, with stool Na^+ and Cl^- averaging respectively 126 mEq/l and 112 mEq/l. Anasarca and severe hypoproteinemia (TP: 3.2 g/dl, albumin: 2.0 g/dl) were secondary to a protein-losing enteropathy. The terminal ileum and large bowel showed cystic dilatation of glands. There was also an acute inflammatory infiltrate of the lamina propria as well as of the glands. These unusual lesions were identical to those described in colitis cystica superficialis known for its association with lethal pellagra, and progressed with time. Small bowel biopsies exhibited a modest degree of villous atrophy and in two there was also mild dilatation of lymphatics. Congenital hepatic fibrosis documented in the four infants was associated in one with a non-fonctional multicystic kidney. Prolonged total parenteral nutrition, I.V. albumin infusions and antibiotics for frequent septic episodes were unsuccessful. A total colectomy in a 10 month old was followed by a temporary decrease in stool output and normalization of serum albumin. All patients died between 4 and 21 months.

● 712 EFFECT OF A PROTEIN SPARING MODIFIED FAST (PSMF) ON PROTEIN METABOLISM OF OBESE ADOLESCENTS.

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We have previously reported the effect of a PSMF on the body compositions of obese adolescents. In the present study we assess its effect on whole body protein metabolism. A fixed diet containing 2.5g protein per Kg ideal body weight per day was given to 16 adolescents (age 12.5-17.4;24-80% over ideal weight). ^{15}N-glycine was administered as a single dose (20mg of ^{15}N) every three days and the cumulative excretion of ^{15}N in urinary urea and ammonia for the following 48 hours was measured. Using a stochastic model (Waterlow,Golden,Garlick,Am.J.Physiol,1978) nitrogen turnover rates (Q), protein synthesis rates (S) and protein breakdown rates (B) were calculated. A pre-fast period of three days on the patient's normal food consumption was used as the control. The effect on protein metabolism, expressed per Kg ideal body weight, is shown below.

	CONTROL	DAY 4	DAY 7	DAY 10	DAY 13
Q (mgN:kg:d)	718±282	991±267**	804±171	772±218	806±203
S (gPr:kg:d)	2.9±1.8	3.8±1.7	2.6±1.1	2.7±1.4	2.9±1.3
B (gPr:kg:d)	2.7±1.7	3.9±1.6	2.7±1.1	2.5±1.3	2.7±1.2

After 4 days on the PSMF nitrogen flux rates increased significantly ($P<0.005$). The rate of protein synthesis increased 31%, while the rate of protein breakdown increased 38%. By day 7 all rates had returned to within the control range. After one week of adaptation to the diet, the PSMF maintains protein metabolism at normal levels, over the 2 weeks of the study period.

713 AGE OF INTRODUCTION OF SOLID FOODS (< 2 MONTHS) AND ITS ASSOCIATION WITH ENERGY INTAKE AND ADIPOSITY DURING THE FIRST 3 YEARS OF LIFE.

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The age of introduction of solid foods and its effect on energy intake, growth and adiposity during the first 3 years of life were studied in 92 healthy male infants from the Greater Philadelphia area. The first solid foods introduced to infant diets were cereals (70%), fruits (4%), and a combination of cereals and fruits (26%). Solids were started by 2 months of age in 48% of infants, by 4 months in 89% and by 6 months in 99%. The age of introduction to solids was decided with basis on physicians' recommendation (39%), mothers' decision (38%), relatives' advice (11%), and other factors (12%). Infants introduced to solids by 2 months of age as compared to others introduced to solid foods after 2 months had: 1) higher but not statistically significant energy intake at 6, 12 and 18 months of age; 2) higher energy intake at 36 months (mean ± SEM 1585 ± 93 vs. 1375 ± 95 Kcal/day, $p < 0.1$); 3) greater triceps (8.2 ± 0.4 vs. 7.4 ± 1.1, $p < 0.05$) and sum of 5 skinfold thickness (27.9 ± 0.3 vs. 25.3 ± 1.5 mm, $p < 0.05$ at 36 months. Fat cell diameter measured during the first year of life and other anthropometrics (weight, height, head circumference, weight/height) measured at 6, 12, 18, and 36 months of age were not influenced by the age of introduction of solids. This study reveals that early initiation of solids (< 2 months) is associated with higher energy intake and greater adiposity at 3 years of age and that the present AAP recommendation for late initiation of solids into infants' diets needs to be more effectively reinforced by health professionals.

† 714 AMINO-ACID (AA) INDUCED REDUCTION OF BILE FLOW IS INDEPENDENT OF TAUROCHOLATE (TC) TRANSPORT.

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Studies in vivo and in perfused rat liver have reported AA induced decrease in bile flow, but conflicting effects on bile salt transport. We studied the effect of a synthetic AA solution (Aminosyn) on bile flow and TC transport in the isolated perfused rat liver. After a 30 min bile collection period, livers of 12 male Sprague-Dawley rats were perfused with KRB buffer, 2 gm% albumin and .1 gm% dextrose in a recirculating oxygenated system for eight 15 min intervals. ^{14}C-TC was continuously infused at 0.25 uM/min. After the initial four 15 min intervals (Period 1), 0.25 gm AA (final conc. 0.1 gm%) was added to the perfusate of six rats (for Period 2). There was no difference between experimental and control rats in weight, pre-perfusion bile flow rate, O_2 consumption, perfusion pressure or flow rate. After initial stabilization, ^{14}C TC secretion and bile flow rate were measured.

RESULTS:	CONTROL Period 1	Pre-AA Period 1	CONTROL Period 2	Post-AA Period 2
Bile Flow ul/min/100 gm	5.53 ± 1.43	5.93 ± 1.19	5.58 ± .80	4.09 ± .57
	N.S.		p <.001	
TC Secretion uM/min/100 gm	.135 ± .016	.131 ± .021	.133 ± .017	.125 ± .022
	N.S.		N.S.	

CONCLUSIONS: 1) Physiologic portal vein concentrations of AA persistently decrease bile flow rate. 2) Initial TC secretion rate is transiently decreased by AA ($P<.05$, data not shown) but returns to control levels without concomitant recovery of bile flow rate. 3) Steady state TC secretion rate is unchanged by AA. 4) These results suggest that AA influence bile water flux via mechanisms unrelated to bile salt transport.