STUDIES IN SICKLE CELL ANEMIA (SCA): PRELIMINARY OBSERVATION ON GASTROINTESTINAL DIGESTION AND ABSORPITON. Fariborz Rahbar, Roland B. Scott, and Pongrac Jilly. Howard Univ. Col. of Med., Dept. of Ped., Washington, D. C.

Not uncommonly, patients with SCA exhibit gastrointestinal symptoms such as constipation, abdominal pain and anorexia. Moreover, these patients may also grow poorly. It is possible that poor growth and abnormal intestinal functions are causally related.

This study was undertaken to determine: 1) the possible relationship between the impaired growth and gastrointestinal disorders; 2) the common gastrointestinal abnormalities seen in patients with SCA; and 3) information on the status of gastrointestinal absorption in patients with SCA.

The adequacy of digestion, absorption, motility and morphology of the gastrointestinal tract of children with SCA was investigated, utilizing several tests and procedures which included: Oral glucose tolerance test, Xylose absorption fat content in 3 day pooled specimens of feces, gelatin absorption In addition, jejunal biopsies were performed on three patients using the Robin's capsule technique. Electron-microscopic examination was performed on biopsy specimens.

Sixteen patients with homozygous ss anemia and two patients with sickle cell-hemoglobin C disease and sixteen matched non-anemic children (controls) were studied. Our investigation using the described techniques fail to disclose any significant abnormalities of the gastrointestinal tract in children with SCA.

CORRECTION OF THE "PHYSIOLOGIC" MALABSORPTION OF THE PREMATURE BY A MEDIUM CHAIN TRIGLYCERIDE(MCT) FORMULA. C.C. Roy, M. Ste-Marie, A. Weber, H. Bard and B. Doray, Univ.of Montreal, Hôpital Sainte-Justine, Dept. of Pediatrics.

Low duodenal bile acid concentrations is the main factor responsible for the fat malabsorption of the newborn and the absorption of MCT is largely independent of micellar solubilisation. One week after birth, 2 isocaloric formulas, of identical protein (casein hydrolysate) and carbohydrate (dextrose) content, differing by the type of fat (MCT vs Long Chain Triglycerides-LCT-) were fed to 25 preterm babies weighing 1300 to 1800 g. During an initial 15 day period, each baby received either MCT or LCT, the alternate formula being given for the second feeding period of identical duration. On MCT, there was a drop in stool fat (7.5→1.1g/72hr) and bile acids 21.9→8.0mg/Kg/72hr as well as a significant increase ($P<.001$) in fat absorption (83.4%→97.1%) and weight gain (7.5→11.5/Kg/24hr/100cal). Because these changes could have been secondary to a significant degree of metabolic acidosis occurring in most of the first 16 babies while on LCT, the chloride content of the formula (33mEq/L) was adjusted to that of the MCT (21mEq/L) before studying the 9 other premies. The beneficial effects of MCT were confirmed and in addition, 3 day balance studies showed an increased ($P<.001$) nitrogen retention (67.3%→82.1%). MCT would appear to have a place in the dietary management of preterm babies.

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ROLE OF FREE BILE ACIDS IN ACQUIRED MONOSACCHARIDE INTOLERANCE (AMI). Rodriguez, J. T., Huang, T. L., Alvarado, J., Klish, W. J., Darby, W. E., Flores, N. and Nichols, B. L. Section of Nutrition and Gastroenterology, Baylor College of Medicine. Houston, Texas 77025. and Unidad de Estudios Clinicos. Hospital Roosevelt. Guatemala.

Glucose malabsorption has been produced in experimental animals fed free bile acids. For this reason it is important to investigate the role of duodenal free bile acid concentrations in infants with AMI. Four subjects who manifested dehydrating diarrhea with acid stools and free fecal glucose in response to a 5 % glucose electrolyte mix were studied. They were compared to 5 infants with Acute non-pathogenic Diarrhea (AD). Duodenal samples were processed by gas-liquid chromatography for free and conjugated bile acids. Glucose absorption was studied by infusing a 10 % solution with 1 % PEG through a double lumen tube in the jejunum. Samples were recovered at 15 minutes intervals from a 30 cm. distal site. Total unconjugated bile acids (ug/ml) were 20.1 ± 8 in normal controls, 58.4 ± 27 in infants with AD and 319 ± 134 in AMI. A linear correlation exists between the concentration of free bile acids of the intestinal fluid and glucose transport rate(r= 0.79). These observations support the role of altered bile acid metabolism in acquired glucose malabsorption.

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BILE ACID KINETICS AND FECAL PATTERNS IN CYSTIC FIBROSIS. C.C. Roy, A.M. Weber, L. Chartrand, G. Lepage, C.L. Morin and R. Lasalle, Univ. of Montreal, Hôpital Ste-Justine, Dept. of Pediatrics, Montreal.

Bile acid (BA) losses in CF are comparable to those seen in ileal resections and are decreased by pancreatic enzymes (Weber et al, N.Eng.J.Med. 289: 1001,1973). Pool size (1.02 and .94g) was measured in 2 CF children off pancreatic enzymes by the technique of isotope dilution. Fasting intraduodenal BA concentrations (25.1 and 22.0mM) were normal. However, the % of deoxycholic acid (10.8 and 8.5) was less than 1/2 reported values and the ratio of glycine/taurine conjugates (4.7 and 4.4) was high. The fecal excretion of BA (.69 and .72g) represented a daily loss of 70% and 77% of their respective pool. The decreased % of secondary BA in their stools reinforced the findings in bile. It was similar to that found in 5 cases of ileal resection (44.2±5.3) as well as in 5 other untreated CF children (46.6±4.5). When the latter were restudied on pancreatic enzymes, the proportion of secondary BA increased significantly ($P<.001$) but was still lower than in 5 controls (87±6.7) and in 5 celiac patients (87.6±3.6). These data indicate that the increased fecal excretion in CF is secondary to BA malabsorption and not to an enlarged pool. Qualitative fecal BA patterns, because of their similarity with those of patients with ileal resections and their response to pancreatic supplements, suggest either a specific ileal absorptive defect or an unidentified intraluminal factor.

ROLE OF ALTERED ANAEROBIC MICROFLORA IN ACQUIRED MONOSACCHARIDE INTOLERANCE (AMI). J.R. Rodriguez, A.J. Mastromarino, J.V. Ordoñez, J. Alvarado, N. Flores, R. Wilson, and B.L. Nichols. Sect. of Nutrition & Gastroenterology, Baylor Col. of Med., Houston, Tex., and Univ. of San Carlos Sch. of Med., Guatemala City, Guatemala.

Six percent of infants with severe acute diarrhea follow a relapsing course associated with the development of glucose intolerance and malnutrition. The basis for diagnosis of AMI is the occurrence of dehydrating diarrhea with acid stools (glucose positive) when fed 5% glucose electrolyte mix. The duodenal microflora was studied in four of these children to determine whether an overgrowth of anaerobic bacterial flora was present simulating the "blind loop" syndrome. Nine patients with acute diarrhea (A.D.) and 10 with chronic non-specific diarrhea (CND) were also studied by the same techniques. The duodenum was intubated and samples obtained for aerobic and anaerobic culture (roller tube technique). Only one of four patients with AMI had strict anaerobic flora present in duodenum (10^5 clostridium sphenoides). Seven of the children with AD had anaerobes present at concentrations > 10^4. In CND none had anaerobes < 10^5. No coliforms were present in the duodenum of subjects with AMI, but were present in 90% of the other infants with diarrhea. The results exclude the primary role of anaerobic bacterial overgrowth in the pathogenesis of AMI. Work supported by Mead Johnson Laboratories, David Underwood Trust, NASA Contract 90059 and USPH RR-00188.

WEIGHT CHANGES AND MORPHOLOGICAL ALTERATIONS IN HAIR OF INSTITUTIONALIZED MENTALLY RETARDED CHILDREN. Manoochehr Saadat, Mushtaq A. Khan, Lois M. Roeder and Felix P. Heald, Dept. Ped., Univ. of Maryland Sch. of Med., Baltimore.

Since recent investigations suggest that mild malnutrition may be present among children in institutions for the mentally retarded, and since malnutrition is accompanied by morphological alterations in hair, a study was undertaken to evaluate nutritional status in 26 subjects aged 8 to 19 years residing in a state hospital by correlating growth (estimated by weight gain) with changes in the diameter of the hair shaft. The body weights were measured and samples of hair obtained in Sept., 1972 and again in Sept., 1973. Changes in body weight during this period were expressed as percentages of the expected weight changes according to the Iowa Growth Charts. The results indicated that 8 subjects gained weight appropriately for age (Group A) while 18 subjects did not (Group B). The mean diameter of the hair shaft for Group A was 7.5 ± 0.5 x 10^{-2} mm (Mean ± SD) and for Group B was 5.9 ± 1.1 x 10^{-2} mm. The difference between these mean values was statistically significant ($P < 0.02$). These findings suggest that serial measurements of hair shaft diameters may be a useful tool for identifying individuals with prolonged mild undernutrition.