29 MACROMOLECULAR ABSORPTION DURING AND AFTER CASTROENTERITIS IN CHILDREN

Stefan Holm, Tor Lindberg, Leif Gothefors

Department of Pediatrics, University of Umeå, Sweden

By using a radioimmunological method (1) Jakobsson, Lindberg et al have found an increased absorption of the macromolecule human α-lactalbumin (LA) in infants with gastrointestinal disorders, such as cow's milk allergy and infantile colic.
This study was performed to answer the question if there is an increased macromolecular absorption during the acute (immediately after rehydration) and convalescent (after 4-9 weeks) phase of gastroenteritis.
Rota-virus was found in 17 of the 20 children studied.
Serum samples were analyzed for LA at 30 and 60 minutes after an intake of human milk. 20 children (aged 1-29 months) were studied in the acute phase. 19 of them had the same low or nonmeasurable amount of LA in serum (mean values 33µg LA/l serum/human milk/kg body weight) as age matched controls (n=90). 11 children were studied again in the convalescent phase. 8 of these 11 children had an increased concentration of S-LA (mean value 123.0) in comparison with the acute phase. 6 had significantly higher concentration than the controls.
Conclusion: Children with gastroenteritis caused by rotavirus does not have an increased absorption of macromolecules (human LA) in the acute phase but an increased absorption was observed 4-9 weeks after the acute phase.

1) Jakobsson et al: Gut 27:1029-34, 1986.

30 THE ROLE OF THE COLON IN MAINTAINING SODIUM HOMEOSTASIS IN YOUNG CHILDREN

Y. Finkel, H.R. Jenkins, I.W. Booth

Institute of Child Health, University of Birmingham, The Children's Hospital, Birmingham and Cardiff Royal Infirmary, U.K.

There are few data in children on the homeostatic responses of the colon to Na depletion. We have studied 8 ileostomy patients (median age 160d, range 45-1030, median weight 3.57 kg, range 3-11.5), before and after the ileostomy closure, using non-equilibrium rectal dialysis and 24hr Na balances. Rectal Na absorption and K secretion (nmol/min/cm^2) were significantly higher in the children with a negative or low positive Na balance (n=7, median Na balance +0.05 mmol/kg/24hr; median Na absorption 238; median K secretion 89) compared with those with a large positive sodium balance (n=6, median Na balance +2.42 mmol/kg/24hr, $p<0.05$; median Na absorption 138, $p<0.05$; median K secretion 42, $p<0.05$). Whilst median rectal Na absorption and K secretion before and after closure of the ileostomy were similar and not different from controls, Cl absorption (nmol/min/cm^2) was significantly lower before (median 139, range 65-231) than after (median 175, range 134-259, $p<0.05$). These data indicate that rectal, and presumably colonic, electrolyte transport is enhanced in children with a negative or low Na balance, and that Cl but not Na absorption is depressed by the temporary diversion of ileal effluent.

31 FETAL DEVELOPMENT OF THE ANO-RECTAL SPHINCTER.

J. Patrick BARBET, Gillian S. BUTLER-BROWNE, Dominique BOURDELAT, Christophe DUPONT.
Hôpital Saint Vincent de Paul, Unité 262 INSERM, & Hôpital Delafontaine, PARIS, FRANCE.

A morphometric analysis of the ano-rectal sphincter was carried out in 45 human fetuses (8-40 weeks), completed by immunocytochemical and biochemical studies of different markers of muscle differentiation (vimentin, desmin, actin, isoforms of the myosin heavy chain (MHC), titin).

The external sphincter (ES) and the m. pubo-rectalis are determined at the earliest stages and contain striated fibers after 10 weeks. After 20 weeks, the internal sphincter (IS) becomes well determined and the ES is colonized by smooth muscle from the longitudinal layer of the rectum, which represents up to one third of the total muscle.

The smooth muscle components express actin, vimentin and sometimes desmin. The striated muscle fibers first express vimentin, desmin, titin and four different isoforms of the MHC - with a very immature pattern of reactivity up until 25 weeks when compared to other striated muscles at the same ages. The maturation is rapid afterwards and almost achieved at 40 weeks : the fibers then express desmin, titin and the slow or the fast MHC.

Conclusions : 1/ the development of the ano-rectal sphincter is characterized by an intrication of smooth and striated muscle, 2/ the ES is partially composed of smooth fibers, 3/ the study of muscle differentiation markers is a new approach to digestive motor function in childhood.

32 AGE DEPENDENT MUCOSAL INFLAMMATORY CELL RESPONSE IN COELIAC DISEASE

L.Röckert[1,3], S.Ahlstedt[2,4], S.P.Fällström[3], W.Ryd[1] and R.Saalman[3,4]. 1. Dpt.Pathology, University of Göteborg 2. Pharmacia Diagnostics AB, Uppsala. 3. Dpt.Pediatrics Mölndal. 4. Inst.Clin.Immunol., University of Göteborg.

We have studied the influence of age on the alterations of mucosal T-cells, immunoglobulin containing cells and monocytes caused by exposure to gliadin in coeliac disease (CD).
Following groups were investigated: Patients with active CD aged 8-12 months (n=7), 24-55 months (n=9) and 9-54 years (n=4).
Controls aged 10-29 months (n=7) and 21-76 years (n=5).
Subsets of inflammatory cells were counted on frozen sections and on paraffin embeded material stained with commercial monoclonal and polyclonal antibodies.
A significant increase of the number of intraepithelial lymphocytes (IEL) and lamina propria lymphocytes (LPL) was found in all age groups with active CD, as reported earlier. The ratio CD4+LPL to CD8+LPL was lower during infancy (1.0) than in older patients (1.3) due to a lower number of CD4+LPL in the infants. The same pattern was observed in the controls, with the ratio 1.1 in children and 1.6 in adults. The number of immunoglobulin containing cells (IgG, IgA, IgM) in tha lamina propria was lower in the young controls than in the adult ones. In active CD there was a marked increase of IgA containing cells in all age groups. The increase of IgM containing cells was more pronounced in the younger patients than in the older, while a minor increase of IgG containing cells occurred in all the patients. There was also a more prominent increase of monocytes in children than in adult patients.
The observed differences may explain the age variation of the clinical course of coeliac disease.

33 OMEGA-3 FATTY ACID STATUS IN PRETERM INFANTS

M.K.Salo, P.Luukkainen and M.Janas

Dept. Pediatrics, Univ. Central Hospital of Tampere, SF-33520 Tampere, Finland

During the last trimester of gestation substantial accretion of long chain PUFA, especially 22:6n-3, takes place in fetal brain. Human milk provides 10-20 mg/dl of 22:6n-3, whereas infant formulas contain no 22-carbon PUFA. We present preliminary results on fatty acid status in 18 preterm infants (birthweight 630-1380 g) and six full term infants fed varying length of time with human milk. Plasma and RBC phospholipid fatty acid compositions were analysed by capillary gas chromatography at 1, 4, 12 and 24 wks. The content of 22:6n-3 in banked human milk was 0.2 to 0.6% of the total FAs, while 22:6n-3 was not detected in formulas marketed. The average breast feeding time in preterm infants was was 3.3 mos (range 1 to 6 mos). Three of the full term babies were formula fed from the beginning. Four of the preterm and three of the full term infants were still on breast milk at 24 wks. The preliminary results showed that preterm infants formula fed had lower content of long chain PUFA in plasma and RBC phospholipids at 12 and 24 wks than those breast fed. The duration of breast feeding had the strongest association with the plasma and RBC 22:6n-3. Similar association was also seen in full term infants These results support the view that long chain n-3 PUFA should be incorporated in infant formulas in a composition that would reflect the fatty acid content of human milk.

34 PROSPECTIVE STUDY OF UPPER GASTROINTESTINAL ENDOSCOPIC FINDINGS IN CHILDREN WITH ULCERATIVE COLITIS AND CROHN'S DISEASE

Mäki M, Ruuska T, Vaajalahti P.

Depts. Paediatr. and Pathol., Univ. Hosp. of Tampere, Finland

The initial work-up of 63 consecutive children and adolescents suspected and later confirmed to have ulcerative colitis (UC) or Crohn's disease (CD) included both upper (UGE) and lower gastrointestinal tract endoscopy as well as X-ray studies. The criteria for grouping as CD included typical roentgenologic lesions of terminal ileum, surgical diagnosis and/or granuloma found on biopsy. The mean age of children with UC was 7.5 years (range 1.2-13.0) and that for CD 12.2 (range 3.5-15.6) ($p<0.001$). There was no difference in the diagnostic delay between the two groups. Clinically CD could not be distinguished from UC as 21 of 32 children with CD presented with symptoms typical for UC. UGE was performed in 55 children including 26 with UC before any medical or nutritional treatment was started. Nonspecific both oesophagitis (44% in UC and 41% in CD) and gastritis (60% in UC and 75% in CD) was common in both diseases. During the last 2 years also 3 Campylobacter pylori culture positive cases were found. Granulomas in the duodenum of 2 children and in the stomach of 7 children were observed. Many of the histological changes including granulomas were found in macroscopically normal mucosa. This is the first prospective study to show frequent upper gastrointestinal mucosal inflammation in both ulcerative colitis and Crohn's disease. Children clinically and endoscopically suspected to have ulcerative colitis may suffer from Crohn's disease.