0031-3998/86/2007-0689$02.00/0
PEDIATRIC RESEARCH

Vol. 20, No. 7, 1986
Printed in U.S.A.

EUROPEAN SOCIETY FOR PAEDIATRIC GASTROENTEROLOGY AND NUTRITION (ESPGAN)

Abstracts of papers and posters presented at the XIX Annual Meeting of ESPGAN, Edinburgh, Scotland, 25–27 June, 1986

1 MACROMOLECULAR ABSORPTION IN THE PRETERM INFANT.

Axelsson, I. and Jakobsson, I.
Department of Pediatrics and Experimental Research, University of Lund, General Hospital, Malmö, Sweden

To date, absorption of macromolecules has been studied by measuring serum concentrations of heterologous food proteins. This means that phenomena like local intestinal and systemic immune responses must be considered when evaluating the results. To avoid these drawbacks we have developed a radioimmunological method for measuring serum concentrations of human α-lactalbumin (αLA).

We have analyzed serum samples from 25 healthy preterm infants fed human milk, gestational age was 26-32 weeks, birth weight <1500 g. Serum was collected at 2 and 4 weeks of age and at term. Results were expressed as μg αLA/l serum/l human milk given/kg body weight.

At 31 weeks of gestation the serum concentration of human αLA was about 10 times higher (mean value 838, n=8) than in the term infants aged 5-30 days (mean value 85, n=7). The serum concentrations of αLA decreased with increasing maturity and at 39 weeks the concentrations was about the same (mean value 118, n=4) as in term infants aged 5-30 days.

Increased absorption of macromolecules in neonates may be a naturally occurring event leading to a state of systemic tolerance to proteins in the normal food. However, an increased absorption of macromolecules acting as antigens may also be associated with a variety of diseases e.g. gastrointestinal allergy.

2 FUNCTIONAL STUDIES ON CELLS FROM HUMAN PEYER'S PATCHES. THEIR PHENOTYPE AND IN VITRO PROLIFERATIVE RESPONSES

Thomas T MacDonald, Jo Spencer, Jo Viney, Christopher Williams and John A Walker-Smith
Department of Paediatric Gastroenterology, St Bartholomew's Hospital, London

During routine diagnostic colonoscopy of children for suspected inflammatory bowel disease it is possible to see Peyer's patches in the terminal ileum. Biopsies were taken of the PP, the lymphocytes isolated by collagenase digestion, and compared with cells isolated from the colonic mucosa. A PP biopsy yielded 2–3 times as many lymphocytes as a biopsy of mucosa (0.6×10^6 from a mucosal biopsy and 1.5×10^6 from a PP biopsy). The frequency of cells bearing the markers UCHT1 (pan T cell), Leu3a (helper/inducer T cells), and UCHT4 (suppressor/cytotoxic T cells) was the same for the 2 cell populations. The major differences were that the PP cells contained B cells and the mucosal lymphocytes contained IgA plasma cells. When stimulated in vitro with PHA or PWM cells from both sites divided. This is the first report on the characteristics and function of human PP cells and will allow us now to determine if IgA specific T and B cells are found in the PP of man as has been reported for rodents.

3 DIFFERENT PATTERNS OF FOOD PROTEIN AND LECTIN BINDING TO NEONATAL AND ADULT MICROVILLUS MEMBRANES (MVM).

M. Stern and B. Gellermann,
Universitaets-Kinderklinik Hamburg, FRG.

Neonatal (NB) rat small intestinal MVM bind more food proteins than adult (AD) controls. To study specificity of this binding, bovine serum albumin (BSA) and concanavalin A (CON A) were radioiodinated. Trace-labelled protein solutions were used for MVM incubation. Separation of unbound material was accomplished by miniature ultracentrifugation. Quantitatively and qualitatively, CON A binding was much different from BSA binding:

CON A:	2.53±0.34 (NB)	3.59±0.56 (AD)
BSA :	0.14±0.02 (NB, $p<0.001$)	0.08±0.02 (AD, $p<0.001$)

(ug/mg MVM protein at concentration 0.01 mg/ml). The relation between protein concentration and binding was linear for BSA. For CON A, this relation showed different patterns in AD and NB, indicating saturation. CON A binding was specifically inhibited by unlabelled protein and by mannan, whereas BSA binding was not. Trypsin treatment of MVM caused a marked increase (88%) of BSA binding to AD, but not to NB MVM. Contrary to CON A binding, BSA binding was not affected by neuraminidase. Binding patterns thus exhibited specificity, saturation, and glycoprotein dependence only for CON A. Unlike lectin binding, BSA binding was nonspecific.

4 LACK OF CORRELATION BETWEEN CHANGES IN INTESTINAL PERMEABILITY TO INERT SUGAR MOLECULES AND TO PROTEINS DURING (1) HYPERSENSITIVITY REACTIONS AND (11) DETERGENT INDUCED GUT DAMAGE IN THE RAT.

P.Boulton, J.Shields, S.Strobel, MW Turner and RJ Levinsky. Dept. Immunology, Inst.of Child Health, London WC1N 1EH

Intestinal permeability to substances such as PEG 400/1000, lactulose/rhamnose (LL/RH) and Cr51-EDTA may be changed in patients with eczema, coeliac disease and inflamatory bowel disease. Such changes may reflect an increased uptake of macromolecular antigens, thereby contributing to the disease process. We have studied the intestinal uptake of two inert sugar molecules (LL/RH) and of the protein bovine serum albumin (BSA). under different experimental conditions. 1) Intestinal anaphylaxis was induced by immunizing adult rats with ovalbumin (OA) and alum. They were then fed 1g BSA (not previously encountered) 1 hour before intra-jejunal challenge. 11) Cetrimide-induced damage: Rats were fed BSA and LL/RH with and without 4mg Cetrimide. Slightly elevated levels of serum BSA and an increased urinary LL/RH ratio were found in the intestinal-anaphylaxis group ($p<0.1$). No correlation was found between the LL/RH ratios and the BSA levels. In rats with cetrimide-induced gut damage LL/RH excretion ratios were significantly increased ($p<0.05$) but there was no increase in BSA uptake.Gut permeability to low molecular weight sugars and to macro-molecular protein antgens do not necessarily correlate well but rather is specific to, & dependent upon.the underlying pathogenic mechanism