41 UPTAKE OF INGESTED PROTEINS FROM THE RAT GUT DURING A LOCALLY-INDUCED HYPERSENSITIVITY REACTION EVIDENCED BY RELEASE OF RAT MAST CELL PROTEASE II.

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Hypersensitivity reactions to dietary proteins may lead to an increased permeability of the gut to macromolecular antigen molecules and thereby contribute to further sensitization. Rats sensitized to ovalbumin (OA) were tube-fed 1g of bovine serum albumin (BSA) and challenged one hour later with 100mg OA introduced directly into the jejunum. Serum samples taken after challenge were analysed for BSA by RIA, and for rat mast cell protease II (RMCP II), a specific marker for mucosal mast cell degranulation, by ELISA. One hour after antigen challenge the levels of RMCP II in the sera of challenged rats were significantly higher than both the pre-challenge levels and those of sham-challenged controls ($p<0.002$). There was no correlation between RMCP II levels and BSA levels in the challenged rats. We conclude that local hypersensitivity reactions in the rat gut may be unequivocally demonstrated by RMCP II release. However, a concomitant increased uptake of "bystander" antigen is not a consistent finding. A role for such an increased uptake in the aetiology of dietary intolerance is not supported by these results.

44 CHANGES IN INTESTINAL PERMEABILITY RELATED TO GLUTEN (G) INGESTION IN CHILDREN WITH CELIAC DISEASE (CD).

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Intestinal permeability to polyethylene glycol (PEG) (MW 238-590) and serum antigliadin antibody levels (AGA) were studied in children with CD, diagnosed according to ESPGAN criteria. Results of intestinal permeability to PEG (obtained as described previously, NASPG/ESPGAN, 1985:80) were expressed as $N_{1/2}$, the theoretical polymer length whose recovery is 50% of the maximally recovered polymer (normal $\geq$ 12). At diagnosis, 0/9 children had normal $N_{1/2}$ and AGA. Twenty-four/28 children on a G-free diet had normal $N_{1/2}$. Two children with abnormal $N_{1/2}$ admitted ingesting G; one had abnormal $N_{1/2}$ at 56 d but normal after 180 d. Only 5 had normal AGA. After 30 d on a G-free diet, 7/8 children had normal $N_{1/2}$; but none had normal AGA. After 77 d on the diet, 12/14 had normal $N_{1/2}$; only 3 had normal AGA. Upon reintroduction of G, $N_{1/2}$ were abnormal in 17/36 with a tendency towards normal levels with longer re-exposure, although small bowel biopsies were abnormal. Regression analysis between $N_{1/2}$ and duration of re-exposure to G indicated a significant association ($r=0.5$, $P < 0.05$); for every day of re-exposure, $N_{1/2}$ improved by 0.006 units. Conclusion: Intestinal permeability rapidly improves with elimination of G from the diet and PEG serves as a good indicator to detect children who are noncompliant. In addition, an apparent adaptation of the bowel occurs with prolonged re-exposure to G, and while histological changes persist and AGA remain elevated, intestinal permeability tends to improve.

42 HISTAMINE RELEASE FROM HUMAN BASOPHILS AND SMALL BOWEL MUCOSAL MAST CELLS.

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The aim of the study was to develop an in vitro method to measure histamine release from human small bowel mucosal mast cells after immunologic as well as non-immunologic mast cell activation. The method was developed using pieces of healthy small bowel mucosa when it could be obtained from patients who underwent surgery. The mucosal tissue (150 mgs) was treated with collagenase (90 mins/37°C), which dispersed the cells. The suspension (containing 2-8% mast cells) was washed 3 times and incubated with anti-IgE, Con-A and the Ca-ionophore A 23187. Histamine release was measured fluorometrically after adsorbtion to glass microfibers. In 5 non allergic patients Con-A and A 23187 released histamine (dose dependend) in all patients. Two responded to anti-IgE. The basophils from the same patients responded to Con-A in 3 - A 23187 in 5 and Anti-IgE in 4 patients.
The results show that human basophils are not necessarily activated by the same stimuli as the mucosal mast cells in the same patient. The method is believed to be useful in the diagnosis of gastrointestinal allergy.

45 ENAMEL HYPOPLASIA (EH) OF PERMANENT TEETH IN COELIAC DISEASE (CD).

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The teeth of 86 children and adolescents aged 3 to 22 years with CD were examined for dental enamel defects. Althogether 73 of 76 (96%) children with permanent teeth had enamel defects. The defects were in contrast to those in controls (n=150) symmetrically and chronologically distributed in all four sections of dentition. 11 (14%) had colour defects, 40 (53%) mild, 14 (18%) moderate and 8 (11%) severe EH. A total of 1356 of 1811 (75%) teeth were found to be defected, in controls only 8%. Heavy clinical symptoms resulted in more severe EH. Orthopantomographs showed in children with deciduous dentition enamel lesions in unerupted permanent teeth in 7 of 9 cases. Gluten free diet before the age of 2 years resulted in normal enamel development of the gingival segment of first anterior permanent tooth in 14 of 16 children. In contrast 10 of 11 children with gluten challenge had EH in this segment ($p<0.001$).

In conclusion, permanent teeth EH is a frequent finding in CD. Thus, when a child has general EH, CD should be suspected. Because of the risk of developing permanent teeth EH, the need of gluten challenge should be reconsidered when planning it to children less than 7 years old.

43 INTESTINAL MAST CELLS AND NEUTROPHIL CHEMOTACTIC ACTIVITY OF SERUM FOLLOWING A SINGLE CHALLENGE WITH GLUTEN IN COELIAC CHILDREN /CD/ ON GLUTEN-DIET:

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The purpose of our study was to investigate the number of mast cells, intraepithelial lymphocytes /IEL/ and other inflammatory cells in the intestine of 14 children with treated coeliac disease following a single challenge with gluten at 5 hours. We examined the neutrophil chemotactic activity of sera obtained at 0,1,3,5 and 24 hours after challenge. There was no significant change in the number of IEL, but the biopsy specimen obtained at 5 hours showed marked increase in inflammatory cells of lamina propria and a significant decrease in the number of mast cells /87$\pm$ 26 cells/mm^2 mucosa in the controlls, 32,3$\pm$ 10,5 cells/mm^2 after challange/. The chemotactic activity of sera showed a significant inrease between 1-5 hours after challenge in 10 out of 14 patients. Serum neutrophil chemotactic activity was measured by a modified Boyden-chamber. These findings suggest that degranulation of mast cells may be involved in the pathogenesis of the CD.

46 PASSAGE OF GLIADIN INTO HUMAN BREAST MILK.

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Cow's milk proteins and ovalbumin have been recently identified in human breast milk(1).The aim of this investigation was to determine whether wheat gliadin is also present in human milk. Following the ingestion of a test meal of 20 g gluten, samples of breast milk were collected from 53 women at various stage of lactation.

Gliadin was assessed by a double-antibody sandwich ELISA and 5 ng/ml or more could be measured in this way. Despite the presence of specific antibodies, prechallenge milk did not inhibit significantly the ELISA.

After ingestion, gliadin was detected in breast milk from 41/53 women at 1 week after delivery, 8/17 at 6 weeks, 3/6 at 3 months and 2/4 at 5 months.The gliadin concentration ranged from 5 to 95ng/ml.Maximum levels in breast milk were found 2-4 hours after ingestion; however, gliadin could not be detected simultaneously in serum.

The transfer of gliadin from mother to child early in his life might be critical for the development in later life of an appropriate specific immune response.

1)Kilshaw P.J.:Int.Archs Allergy appl.Immun. 75,8-15,1984.