

embolus, underdiagnosis in other series. We have now set up a prospective trial to evaluate these factors.

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MICROSOMAL ANTIBODY AND CIRCULATING IMMUNE COMPLEXES IN ALLERGIC GASTROENTEROPATHY

SIR,—Allergic gastroenteropathy is a rare disorder presenting with peripheral eosinophilia and eosinophilic infiltration of the digestive tract.¹ Raised serum-IgE levels,² positive skin tests to food allergens,³ and favourable response to corticosteroid treatment³ reported in some cases, suggest an allergic pathogenesis. We report here a patient with allergic gastroenteropathy in whose serum we found antibody to a microsomal ubiquitous tissue antigen (U.T.A.) and circulating immune complexes.

A 28-year-old male was admitted to the hospital for evaluation of recurrent lower abdominal pain and diarrhoea. Because X-ray findings suggested small-bowel obstruction, an exploratory laparotomy was done. Marked inflammatory changes affecting about half the jejunum were noted and 3 litres of ascitic fluid were recovered. The diagnosis of allergic gastroenteropathy with serosal involvement was based on eosinophilia in peripheral blood (64%), and ascitic fluid (97%) as well as on markedly eosinophilic infiltrates of the peritoneum, mesenteric lymph-nodes, and the diseased jejunal segment. Circulating IgG and IgA concentrations were low and IgM and IgE levels were normal. Repeated stool examinations for ova and parasites were negative. After an uneventful recovery, the patient reported abdominal pain which he attributed to milk intake. His eosinophils rose to 43% during such episodes. He was advised to avoid milk altogether and has remained well. His eosinophil count is now normal.

U.T.A.⁴⁻⁶ is a microsomal antigen which is released into the circulation in some pathological conditions (idiopathic membranous nephropathy, rheumatoid arthritis, chronic liver diseases) and which can stimulate autoantibody formation.

One serum sample from the above patient was collected during active disease and two samples during recovery. In Ouchterlony tests, each of these sera produced a distinct line with a standard U.T.A. preparation. These lines merged into identity reaction with a line formed by a reference serum containing antibodies to U.T.A. The precipitation line formed with serum obtained during active disease was stronger than with sera collected during recovery. U.T.A. was not demonstrated in any of these sera.

Immune complexes were detected by means of the anti-antibody neutralisation test.⁷ In this assay human anti-antibody is used. This antibody is an IgM serum factor, specifically combining with homologous IgG antibodies, which underwent molecular transformation in reactions with their corresponding antigens.⁸ Immune complexes were present only in the serum sample obtained during active disease. In an attempt to identify the antigen in the complex, an excess of U.T.A. was added to the serum which neutralised anti-antibody activity. This resulted in the loss of neutralising power. We interpreted this result as evidence that the added U.T.A. created an excess

of antigen in the immune complexes (such complexes have no affinity for anti-antibody).

Thus, in this particular case, severe tissue damage in the course of allergic gastroenteropathy resulted in formation of antibodies to U.T.A. and immune complexes composed of U.T.A. and its corresponding antibodies. When the patient recovered the immune complexes disappeared and antibody activity became less strong.

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RESPIRATORY HAZARDS FROM PROTEOLYTIC ENZYMES

SIR,—Dr Flindt (Feb. 25, p. 430) reported a case of asthma developing during occupational exposure to papain powder. Over the past year we have seen three comparable cases of immediate hypersensitivity to proteolytic powders. All three patients were women and had had atopic manifestations for several years. They had recently started to work in a pharmacy where they filled prescriptions. After a few months all three had severe asthmatic attacks when handling 'Flaviastase' (a proteolytic extract of *Aspergillus niger* in powder form mixed with other proteolytic enzymes in the preparation of digestive powders). The dyspnoea started immediately upon exposure to flaviastase.

We investigated the three patients with skin tests and radioallergosorbent tests (RAST). All had immediate skin reactions to several common inhalant allergens. RAST was done with flaviastase coupled to cyanogen-bromide activated paper discs.^{1,2} All three patients had a positive RAST for flaviastase. No cross-reactivity with *A. fumigatus* was observed. Precipitating antibodies to flaviastase or *A. fumigatus* could not be demonstrated.

These three cases illustrate again the sensitisation potential of proteolytic enzymes for the development of immediate-type hypersensitivity as is already known for *Bacillus subtilis* proteolytic enzymes^{3,4} and, now, papain.

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ULTRASOUND TO TIME INSEMINATION

SIR,—Grey-scale ultrasonic B scanning can be used to locate the ovaries and the follicles in them¹ and also to monitor the growth of follicles to determine the best time for administering H.C.G. in, for example, H.M.G.-H.C.G. therapy. During a normal menstrual cycle the follicles are 12–14 mm in diameter at ovulation. During H.M.G. therapy the follicle is ideal for rupture only when the diameter is 18–24 mm. Ultrasound also shows how many follicles are maturing, knowledge which might help to avoid catastrophic multiple pregnancies.

We have devised a method for timing insemination to avoid futile inseminations which frustrate the patient, her doctor,

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