Case Report

Allergic eosinophilic gastroenteritis in a child with Crohn's disease

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Summary: A case of a child with Crohn's disease who developed an eosinophilic gastroenteritis is reported. Although symptoms of eosinophilic gastroenteritis at age 8 could mimic those of Crohn's disease, laboratory, radiographic and histologically studies are clearly different. Peripheral blood eosinophilia (7,476 cells per mm3), high serum IgE level (1,050 kU/l) and normal C-reactive protein and erythrocyte sedimentation rate are common in eosinophilic gastroenteritis and uncommon in Crohn's disease. Eosinophilic gastroenteritis was due to bovine serum albumin (BSA) hypersensitivity, confirmed with skin tests, serum levels to specific IgE and a SDS-PAGE IgE-immunoblotting. A strict meat-free diet was started, with progressive relief of symptoms and decrease of eosinophil count twelve months later; the patient became fully symptom-free and eosinophil count was normal.

Key words: Bovine seroalbumin, Crohn's disease, eosinophilic gastroenteritis, food allergy

Introduction

Crohn's disease is an idiopathic chronic transmural inflammation that may involve any part of the alimentary tract from mouth to anus. The clinical hallmark of the disease is a chronic history of recurrent episodes of abdominal pain and diarrhea [1]. Although Crohn's disease affects mainly young people, particularly those in their teens and twenties, a very low incidence before age 5 has been reported [2,3]. In these young patients extraintestinal symptoms are prominent, and fever, anemia, weight loss and growth failure are common [4].

Eosinophilic gastroenteritis is an uncommon disease characterized by tissue eosinophilia that involves the different layers of the gut wall. Clinical and pathologic features are variable depending on the predominant gut layer involved and the disease is usually classified as mucosal, muscle layer or subserosal. The most prevalent form is predominantly mucosal layer disease with symptoms including colicky abdominal pain, nausea, vomiting, diarrhea and weight loss. The pathogenesis of the disease remains unknown but, at least in patients with predominant involvement of the mucous layer, high serum IgE levels [5], atopic background and high prevalence of food intolerance or allergy have been reported [6].

A young boy previously diagnosed with Crohn's disease who developed eosinophilic gastroenteritis due to bovine serum albumin (BSA) hypersensitivity is described.

Case report

A 5-year-old boy presented with abdominal pain, diarrhea, weight loss and fever for the last 3 weeks, and was admitted into a hospital. The patient had suffered similar gastrointestinal symptoms since one year before, and was treated with antibiotics. Physical examination revealed pallor and generalized abdominal tenderness. Laboratory data at admission showed white blood cell count of 18,600/mm^3, with a differential count of 21% lymphocytes and 72% neutrophils and hemoglobin of 9.3 g/dL with MCV 90 fL. C-reactive protein was 8.10 mg/100mL and erythrocyte sedimentation rate was 29. Liver and renal function tests were within normal ranges.

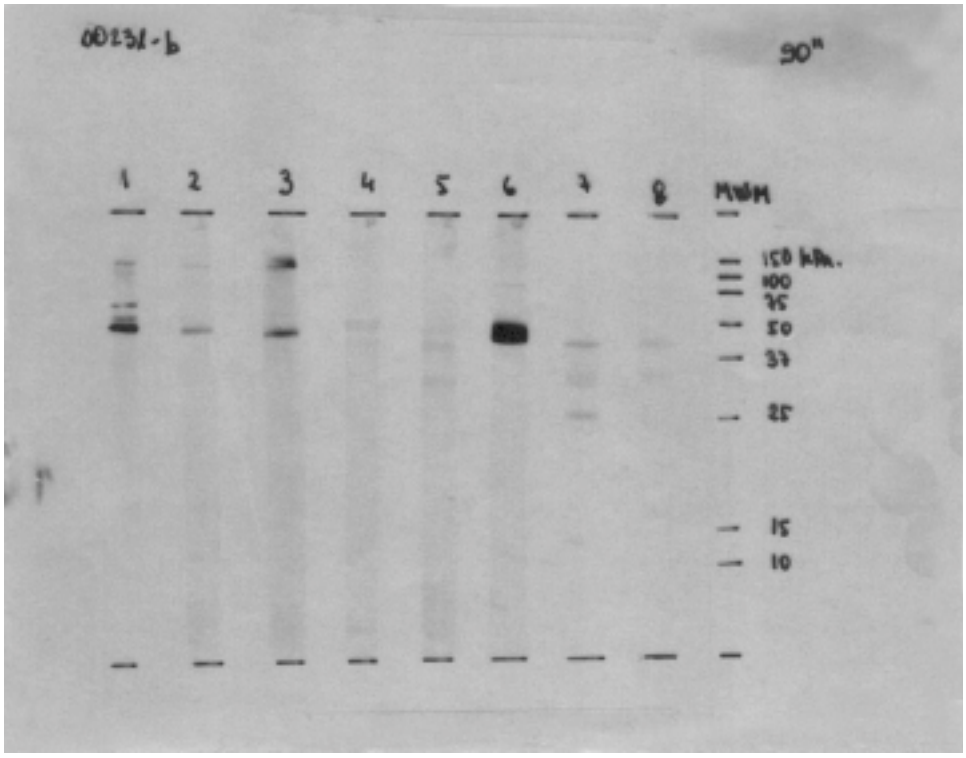

Figure 1. SDS-PAGE IgE-immunoblotting of the patient's serum. Lane 1: pork meat; 2: beef meat; 3: lamb meat; 4: rabbit meat; 5: chicken meat; 6: bovine serum albumin (BSA). 7: Negative control (pork + beef meat); 8: negative control (rabbit + chicken meat). The position of the molecular wight markers in kDa is indicated.

Serum ferritine was 43 ng/mL. The chest x-ray was normal. Abdominal ultrasonography showed multiple lymph nodes up to 4 cm diameter in the right lower quadrant and around periumbilical region. Parasite ova in faeces, three blood cultures and serologic tests for salmonella, shigella, yersinia, adenovirus, human immunodeficiency virus-1 and hepatitis A and B virus were negative. Upper gastrointestinal endoscopy up to second duodenum was normal. Colonoscopy up to cecum was normal and biopsies showed a chronic inflammatory infiltrate and some epithelioid noncaseating granulomas. Gastrointestinal barium studies showed thickness of ileal wall, denuded areas of the mucosa and narrowing of the terminal ileum. The clinical presentation, laboratory data, characteristic radiographic findings and histologic features lead to the diagnosis of Crohn's disease. A treatment with enteral nutrition and sulfasalazine started which brought the patient into remission and kept him symptom-free.

Three years later, the patient was admitted to the hospital with abdominal pain, vomiting, diarrhoea and weight loss of three weeks' evolution. Although the clinical pattern pointed to a recurrence of Crohn's disease, the patient and his mother claimed that episodes of abdominal pain were elicited by the intake of different meats in the last two months. On examination, abdominal tenderness was observed. Laboratory data at admission revealed white blood cell count of 17,800/ mm^3, with a differential count of 17% lymphocytes, 40% neutrophils and 42% (7,476 cells per mm^3) eosinophils. Liver and renal function tests were within normal ranges. Serum IgE was 1,050 kU/L. ANA and anti-gliadin, endomisial and transglutaminase antibodies were negative. Stool cultures and three determinations of parasites ova in faeces were negative. The abdominal ultrasound study showed ileum and jejunal lymph nodes. The upper gastrointestinal endoscopy up to second duodenum was normal. Biopsies of the duodenal mucosa revealed a large inflammatory infiltrate of eosinophils, lymphocytes and mast cells located mainly in the lamina propria.

Skin tests to inhalant allergens were positive to grass pollen and to *Alternaria alternata* as well as to extracts of beef, pork, rabbit, lamb and horse meats, but negative to chicken meat and to other common foods. Specific IgE antibodies were positive (class 3) to all these meats but chicken. SDS-PAGE IgE-immunoblotting (Figure 1) showed the presence of BSA-specific IgE antibodies in the patient's serum. Moreover, IgE antibodies against pork-, lamb- and rabbit-homologous proteins -but not against chicken- were also detected. Additionally, a 165 kDa protein band –perhaps IgG or albumin aggregates-, recognized by the patients's serum IgE was found in beef, pork and lamb meat extracts. Challenges with several meats were proposed but refused by the child's parents.

A strict meat-free diet started, with progressive symptom relief and decrease of eosinophil count. Twelve months later, the patient became fully symptom-free and eosinophil count was normal. One year later,

no incidences have been reported, except a short episode of abdominal cramps and diarrhea occurred after inadvertently consuming meat broth.

Discussion

A child with Crohn's disease who developed a meat-allergic eosinophilic gastroenteritis three years later is described. Although at first we were tempted to think that the patient was only affected by eosinophilic gastroenteritis, both clinical and laboratory data clearly differentiated the two diseases.

Crohn´s disease was diagnosed at age 5 on the basis of a typical clinical presentation with abdominal pain, diarrhea, weight loss and fever, and laboratory data showing a defined inflammatory activity. Moreover, characteristic radiographic findings of the terminal ileum, and histologic features confirmed the diagnosis.

Although symptoms of eosinophilic gastroenteritis at age 8 could mimic those of Crohn's disease, laboratory, radiographic and histologically studies are clearly different. Peripheral blood eosinophilia (7,476 cells per mm^3), high serum IgE level (1,050 kU/l) and normal C-reactive protein and erythrocyte sedimentation rate are common in eosinophilic gastroenteritis and uncommon in Crohn's disease. Food allergy, as confirmed in our patient, has been reported in mucosal-predominant eosinophilic gastroenteritis, particularly in children. Furthermore, the large inflammatory infiltrate of eosinophils, lymphocytes and mast cells located mainly in the lamina propria, confirm the diagnosis of eosinophilic gastroenteritis.

Eosinophilic gastroenteritis is an uncommon disorder that occurs mainly in adulthood [7], and since its description by Kaijser in 1937 [8], only single cases or small series of patients have been reported. The diagnosis of eosinophilic gastroenteritis requires the presence of gastrointestinal symptoms, eosinophilic infiltration of one or more areas of the gastrointestinal tract, and absence of parasitic infestation and of extraintestinal disease [7]. Peripheral eosinophilia is present in 77% of the cases, and 50% have a past or family history of allergic diseases [7]. Our patient showed a high total serum IgE level, skin immediate hypersensitivity to beef, pork, rabbit, lamb and horse meats and IgE antibodies against albumin present in bovine, pork, rabbit, lamb and horse's sera and meats. The fact that the patient remained symptom-free and normalized his eosinophil count following a meat-free diet support the implication of meats in the pathogenesis of the disease, which only relapsed when inadvertently consuming meat broth.

The association of Crohn's disease with eosinophilic gastroenteritis is singular and moreover, BSA is a rare allergen. Actually, only one case of eosinophilic gastroenteritis due to BSA has been reported to date [9]. A possible explanation for this association is that under determined conditions, the inflammatory bowel disease enhances the way in of whole food allergens, thus increasing the possibility of BSA sensitization and the development of eosinophilic gastroenteritis.

References

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