Eosinophilic Esophagitis, Celiac Disease, and Immunoglobulin E–Mediated Allergy in a 2-Year-Old Child

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Abstract

Celiac disease, eosinophilic esophagitis, and urticaria are 3 manifestations of food allergy with different pathogenic mechanisms. We report the case of a 2-year-old child with digestive symptoms, slow growth, and severe asthma. The results of skin prick tests were positive to several foods. Endoscopy revealed eosinophilic esophagitis and celiac disease. Treatment consisted of a gluten-free diet and a 1-month course of oral corticosteroids. Endoscopy and biopsy findings were normal at 5 years of age.
A gluten-free diet is the basis of treatment of celiac disease, but the role of an elimination diet in eosinophilic esophagitis is not well established. Our patient also developed urticaria when exposed to milk and egg. We present, to our knowledge, the first report of a patient with celiac disease, eosinophilic esophagitis, and immediate-type immunoglobulin E–mediated food allergy.

Key words: Eosinophilic esophagitis. Celiac disease. Food allergy. IgE-mediated allergy.

Resumen

Enfermedad celíaca, esofagitis eosinofílica y urticaria son tres manifestaciones clínicas de alergia a alimentos con diferente etiopatogénesis. Describimos el caso de una niña de 2 años de edad con síntomas digestivos, retraso del desarrollo póndero-estatural y asma persistente. Las pruebas cutáneas fueron positivas a varios alimentos. La endoscopia digestiva y biopsias mostraron signos de esofagitis eosinofílica y enfermedad celíaca. Realizó dieta exenta de gluten y de los alimentos a los que estaba sensibilizada y siguió tratamiento con corticoides orales un mes. A los 5 años de edad, la endoscopia digestiva alta y biopsias esofágicas fueron normales.
Una dieta exenta de gluten es la base del tratamiento de la enfermedad celiaca. Sin embargo, el papel de las dietas de eliminación en la esofagitis eosinofílica no ha sido totalmente establecido. La paciente desarrolló además urticaria tras contacto con leche y huevo. Presentamos el primer caso de enfermedad celiaca, esofagitis eosinofilica y alergia alimentaria mediada por IgE en el mismo paciente.

Palabras clave: Esofagitis eosinofílica. Enfermedad celiaca. Alergia alimentaria. Alergia mediada por IgE.

Introduction

Celiac disease, eosinophilic esophagitis, and urticaria are 3 manifestations of food allergy with different pathogenic mechanisms. Based on their immunologic causes, allergic reactions to food can be classified as either immunoglobulin (Ig) E–mediated (oral allergy syndrome, urticaria, and anaphylaxis), non–IgE-mediated (food protein–induced enteropathy and celiac disease), or mixed (eosinophilic esophagitis and gastroenteritis) [1]. Whereas avoidance of the causal food (ie, gluten in celiac disease) is a widely accepted form of managing IgE-mediated and non–IgE-mediated disorders, the benefits of this strategy are still unclear for eosinophilic esophagitis [2].

To our knowledge, this is the first report of a patient with celiac disease, eosinophilic esophagitis, and IgE-mediated allergy to food.

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Case Description

A 2-year-old girl was referred to our clinic with atopic dermatitis, severe asthma, abdominal pain, diarrhea, vomiting, anorexia, and slow growth (below the third percentile) since she was 8 months old. She had been breastfed for 2 months and, since then, was receiving cow's milk–based adapted formula. Egg yolk was introduced when she was 8 months old, although this led to vomiting and exclusion of egg from her diet. Other foods were well tolerated.

Previous workups at another hospital 1 year earlier were negative for celiac antibodies on 2 occasions. Specific IgE was positive for cow's milk and egg. The girl had been on a milk-free and egg-free diet for 1 year, although her gastrointestinal symptoms did not improve and her atopic dermatitis and asthma persisted.

Skin prick tests (SPT) performed in our hospital were positive for milk, egg, legumes (lentil, chickpea, peanut, and pea), fish (dory, anchovy, hake, and cod), and dust mite. The results for specific IgE are shown in the Table. A complete blood count revealed 12% eosinophils (830/mm^3) and normal total IgA. Celiac serology revealed an IgA antigliadin antibody titer of 22.30 U/mL, an IgA tissue antitransglutaminase titer of 79.1 U/mL, and an endomysium antibody titer of 1/640 (positive). Esophageal pHmetry was normal. Esophageal endoscopy showed rings and white mucosal exudates (Figure).

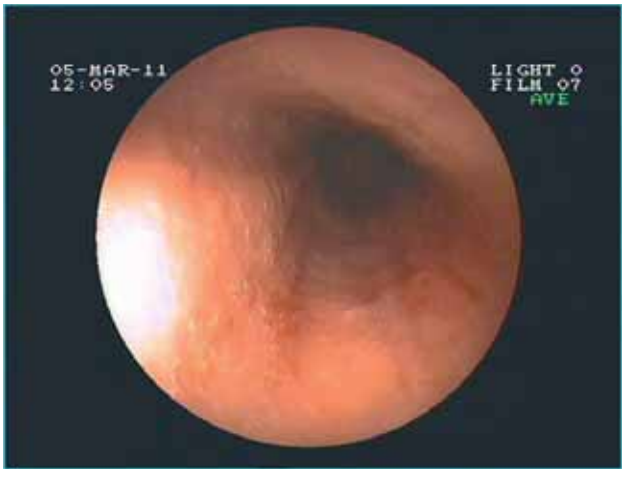

Figure. Esophageal endoscopy showing rings and exudates, which are indicative of eosinophilic esophagitis.

Analysis of biopsy specimens from the proximal, middle, and distal esophagus showed >20 eosinophils/HPF in mucosa. Analysis of biopsy specimens from the duodenum revealed villous atrophy, crypt hypertrophy, and intraepithelial lymphocytes. The results of testing for human leukocyte antigen (HLA)-DQ2 and DQ5 were positive. The patient was diagnosed with eosinophilic esophagitis, celiac disease, atopic dermatitis, and sensitization to dust mite, milk, egg, legumes, and fish.

Treatment consisted of a diet free of gluten, fish, legumes, egg, and milk, and she was prescribed a 1-month course of oral prednisolone (1 mg/kg/d) combined with inhaled fluticasone, salbutamol, and antileukotriene for asthma control.

Table. Specific Immunoglobulin E to Aeroallergens and the Most Common Foods in the Spanish Diet at the First Visit and 1 Year After Treatment[a]

Allergen	sIgE, kU_A/mL First Visit	sIgE, kU_A/mL 1 Year After Treatment
Dermatophagoides pteronyssinus	1.00	10.6
Dermatophagoides farinae	1.19	5.3
Cow's milk	32.30	49.2
α-lactalbumin	18.90	60.8
ß-lactoglobulin	2.58	11.5
Casein	16.80	31.7
Egg	31.00	27.2
Egg white	36.10	24.8
Egg yolk	3.82	2.6
Ovalbumin	43.20	30.4
Ovomucoid	44.80	30.5
Pea	5.29	5.63
Soy	1.43	2
Lentil	4.55	6.2
Chickpea	5.00	4.65
Bean	<0.35	1.32
Cod	4.66	2.53
Trout	4.69	2.26
Hake	5.13	1.71
Dory	6.32	3.21
Swordfish	<0.35	0.37
Gliadin	<0.35	ND

Abbreviations: ND, not done; sIg, specific immunoglobulin.
[a]Measured by CAP (Phadia Diagnostics, Uppsala, Sweden).

One year later (3 years of age), her growth, atopic dermatitis, and gastrointestinal symptoms had improved. A complete blood count showed 1.8% eosinophils (125/mm^3). Sensitization to egg, legumes, and fish remained unchanged (Table). Oral challenges performed with fish (dory, anchovy, hake, and cod) were negative. At the age of 5, oral challenges performed with legumes (lentils, pea, chickpea, soy, and peanut) were negative. Legumes and fish are now well tolerated. An oral challenge with milk elicited abdominal pain and facial urticaria, and a challenge with egg elicited immediate generalized urticaria. Therefore, neither food was introduced in her diet. Esophageal endoscopy and duodenoscopy were repeated when she was 5 years old. The appearance of the esophagus was normal, as were biopsy specimens taken from the esophagus and duodenum.

Our patient is now 6 years old and follows a diet free of egg, milk, and gluten. She has no gastrointestinal symptoms, her weight and height are above the tenth percentile, and her atopic dermatitis has improved. Her asthma is controlled with inhaled fluticasone 50 μg bid.

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Discussion

We report a case of food allergy with 3 types of manifestations. The initial symptoms were attributed to celiac disease and eosinophilic esophagitis, although an oral challenge also revealed IgE-mediated food allergy to cow's milk and egg.

The coexistence of eosinophilic esophagitis and celiac disease in the same patient was first described in 2007 by Verzegnassi et al [3], who observed that patients with eosinophilic esophagitis seemed more likely to develop celiac disease than the general population. Since then, a number of cases have been described in Italy by Quaglietta et al [4], who found 35.2% of cases with both diseases in patients diagnosed with eosinophilic esophagitis. This prevalence was lower (3.2%) in an Australian report [5]. However, both diseases are relatively common, and their coexistence should be recognized with a respectable degree of certainty [6].

The pathogenic mechanism underlying the simultaneous presence of these conditions remains unknown, and their co-occurrence may be mere coincidence. In fact, there are fundamental differences in the pathogenic mechanisms involved in eosinophilic esophagitis and celiac disease. Celiac disease is thought to be a helper T cell (T_H) type 1–mediated disorder, whereas eosinophilic esophagitis has been shown to be T_H2-mediated and is associated with IgE-mediated and non–IgE-mediated food allergy [4,6]. Although it is not unusual to find circulating eosinophils in patients with celiac disease [3], the presence of eosinophils in bowel biopsies is exceptional. However, eosinophil counts of over 20/HPF in biopsy specimens of 3 parts of the esophagus (proximal, middle, and distal) are diagnostic for eosinophilic esophagitis [7]. It is also clear that some cases of eosinophilic esophagitis improve with a gluten-free diet, suggesting that both disorders may have a common pathogenic mechanism [3]. In our patient, a T_H2-mediated disorder was also associated with IgE-mediated allergy.

The clinical symptoms of eosinophilic esophagitis vary with age. In young babies, they usually consist of feeding disorders, slow growth, vomiting, and abdominal pain, all of which are symptoms of celiac disease [8]. Thus, whether or not food-specific IgE is detected in a celiac patient, eosinophilic esophagitis should be investigated by performing simultaneous biopsies of the esophagus and duodenum [5]. The first symptoms in our patient would have been attributed only to celiac disease, but sensitization to multiple foods was detected without immediate allergic cutaneous symptoms, thus suggesting eosinophilic esophagitis.

A gluten-free diet is the basis of the treatment of celiac disease [9]; however, the role of an elimination diet is not well established in eosinophilic esophagitis [7,10,11]. Clinical and histological changes have been observed in patients on such a diet [7,11,12], and in our case, esophagitis improved considerably when these foods were avoided. Therefore, an allergy workup seems crucial when establishing a food-avoidance strategy for treatment of IgE-mediated eosinophilic esophagitis. [11,12]. It is noteworthy that our patient also developed urticaria when exposed to milk and egg, thus suggesting the coexistence of an immediate-type IgE-mediated food allergy.

In conclusion, we report, to our knowledge, the first case of celiac disease, eosinophilic esophagitis, and immediate-type IgE-mediated food allergy occurring simultaneously in the same patient.

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All the authors have declared that they have no conflicts of interest.

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