

Correspondence

Eosinophilic esophagitis treated with immunotherapy to dust mites

To the Editor:

Eosinophilic esophagitis (EoE) is an allergic inflammatory disease in which the esophagus is infiltrated by eosinophils, presumably through a T_H2 -driven process. Although not completely understood, we have known for many years that food allergies play a role in some cases of EoE. Multiple recent reports have suggested that hypersensitivity to pollen might also play a part in the development of this disease.^{1,2} Some have even suggested that cross-reactivity between foods and pollens, similar to what is seen in patients with oral allergy syndrome, might also be a culprit. Most recently, in the February 2013 issue of the *Journal of Allergy and Clinical Immunology*, De Swert et al³ shed some light onto this cross-reactivity by presenting a case with birch pollen and apple allergy. This case also presents the possibility that immunotherapy to the pollen in question might have improved the symptoms and findings consistent with EoE.

Cases of indoor allergens and their relationship with EoE are less well documented. Animal models have shown that there is an increase in eosinophil counts in the esophagus after a nasal challenge with dust mite and roach allergens.⁴ To our knowledge, the potential role of immunotherapy to indoor allergens and its effect on EoE have not been reported. We describe a case of dust mite hypersensitivity, EoE, and subsequent clinical and pathologic improvement after high-dose immunotherapy in a pediatric patient.

A 4-year-old boy presented to our clinic for an evaluation of chronic rhinitis, which manifested mainly as perennial nasal congestion and rhinorrhea. His past medical history was also remarkable for recurrent episodes of vomiting soon after eating, starting at the age of 6 months. The patient was eating baby food and regular formula at the time. Symptoms seemed to happen more with green peas. At this time, the patient was treated by a gastroenterologist for gastroesophageal reflux disease with ranitidine. Symptoms were well controlled until the age of 1 year, when solid foods were introduced, at which point the episodes of nausea and emesis returned.

An allergist evaluated the patient at this time. ImmunoCAP (Phadia, Uppsala, Sweden) to foods was performed, revealing multiple sensitivities, with the highest specific IgE levels seen for peanut, milk, green pea, and almond. Eliminating these foods did not yield consistent results in controlling the episodes of emesis. By the age of 2 years, he had been receiving 10 mg/d omeprazole daily for about 3 months before he had an endoscopy that confirmed a diagnosis of EoE (Fig 1). A total of 4 biopsies were done, results of which showed eosinophil counts of greater than 25 per high-power field. Other than food elimination, the patient was also tried on oral fluticasone and probiotics. The episodes of emesis had improved, but a follow-up biopsy by the age of 4 years still revealed evidence of EoE.

At this point, the patient was evaluated at our clinic. Skin testing revealed sensitivity to peanut and soy but also to dust mites. Avoidance of these foods did not again provide consistent relief of his symptoms. He was then started on high-dose immunotherapy to *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus*. He received a monthly maintenance dose

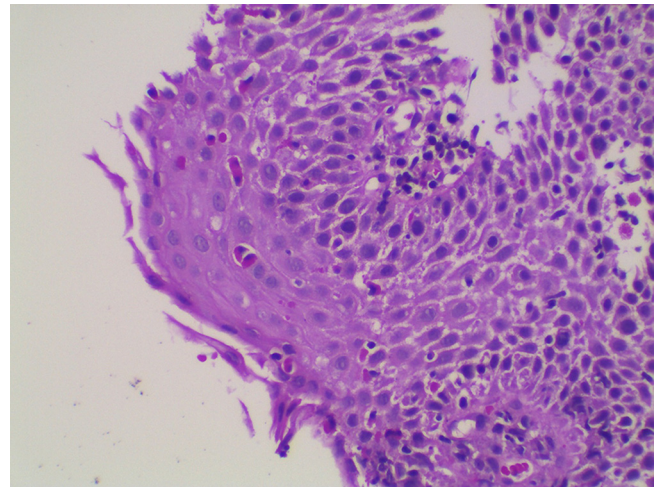


FIG 1. Distal esophageal biopsy specimen showing numerous eosinophils within the squamous epithelium (>25/high-power field). Some RBCs are noted. Occasional lymphocytes, spongiosis, and basal cell hyperplasia are also evident. Eosinophilic microabscesses were also present (not shown).

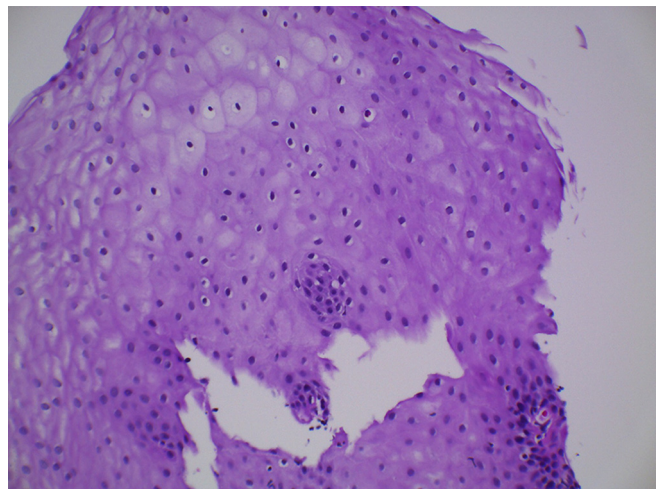


FIG 2. Distal esophageal biopsy specimen showing mild intraepithelial lymphocytes and rare eosinophils.

of 0.5 mL of a mix of both allergens at a final concentration of 4000 AU/mL (ALK-Abelló, Round Rock, Tex) of each. Over the following 2 years, his episodes of emesis resolved. By the age of 6 years, he was able to stop fluticasone and continued to receive 10 mg of esomeprazole for about 6 months before he had a third esophageal biopsy. A total of 4 samples were taken from the esophagus, which revealed rare eosinophils (Fig 2). Today, at the age of 8 years, the patient continues to be in remission. Follow-up skin testing did not show reactivity to *D farinae* and *D pteronyssinus*.

A growing body of evidence supports the relationship between aeroallergens and EoE. Fogg et al,² in a letter to the Editor, discussed a case that showed a correlation between pollination seasons and the number of eosinophils per high-power field in the esophagus. A recent review of the literature¹ also found a

correlation between the percentage of patients given a diagnosis of EoE versus other diseases and pollen levels in the area. During seasons when the pollen counts are low, there was a significantly low number of cases reported. Conversely, during high pollen seasons, there was a significantly high number of cases. The likely explanation was that aeroallergens trapped in postnasal drainage were being swallowed, eliciting a recruitment of eosinophils through direct contact with the lining of the esophagus.²

The possible role of immunotherapy for these patients has been previously presented by Perez et al⁵ and more recently in a letter to the editor by De Swert et al.³ Our case also suggests that immunotherapy might play a role in treating this disease. Unlike De Swert's group, which showed a connection between birch pollen and apple allergy because of the cross-reactive pathogenesis-related class 10 protein, our case did not show a cross-reactivity between dust mites and shrimp, which has been linked to tropomyosin. Our case suggests that inhaled perennial aeroallergens, through natural drainage down the esophagus, must also be considered when evaluating and treating EoE, particularly when avoidance of food does not seem beneficial. Controlled studies are needed to better understand EoE, aeroallergen sensitivity, and the potential role for immunotherapy.

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Disclosure of potential conflict of interest: The authors declare that they have no relevant conflicts of interest.

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