



Eosinophilic esophagitis due to red yeast rice (Monacoline K) in a dietary supplement for hypercholesterolemia

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Abstract

We present a case of eosinophilic esophagitis (EoE) with positive skin-prick testing for type I allergy to red yeast rice (RYR, Artechol®). RYR is an over-the-counter supplement for hypercholesterolemia, since years famous in Asian countries and now also more and more popular in Western countries. The clinical relevance of IgE-mediated inflammation was proven by a rapid clearance of EoE-symptoms upon discontinuation of RYR. The role of skin-prick testing and allergy testing in general in EoE is controversial, but was of high importance in our patient. It demonstrates that in cases of a clear-cut allergy history, together with positive skin-prick (IgE) testing, a broad elimination diet can thus be avoided.

Keywords Eosinophilic esophagitis · Hypercholesterolemia · Monacoline K · Red yeast rice · Skin-prick testing

Introduction

Eosinophilic esophagitis (EoE) is a chronic, usually food-induced type 2 inflammatory disorder of the esophageal mucosa [1]. T helper 2 cells orchestrate the recruitment and activation of immunoglobulin E (IgE) producing B cells, mast cells, and eosinophils [2]. Most patients with EoE have an atopic profile with one or more type 2 comorbidities (food allergies, atopic dermatitis, allergic asthma, allergic rhinoconjunctivitis) [1]. Frequent food triggers of EoE include: milk, egg, wheat, soy, and peanuts [1]. The diagnosis is based on three criteria: -symptoms of esophageal dysfunction (e.g., dysphagia), -the presence of ≥ 15 eosinophils/high power field in at least one esophageal biopsy, and -exclusion of other possible causes [3]. The work-up for IgE-mediated food allergies normally includes either skin-prick testing (SPT) for the allergen and/or measuring serum specific-IgE. We present an unusual case of a patient with EoE, provoked by red yeast rice (RYR).

Case report

A 58-year-old male with biopsy proven EoE was referred to our department by his Gastroenterologist for allergy work-up, since esomeprazole therapy lead only to minor improvement (Figs. 1, 2). History revealed that EoE complaints (chronic dysphagia without gastroenteritis) occurred 12 months after starting RYR (Artechol®, active ingredient: Monacoline K) for hypercholesterolemia. He did not take any other medication or supplements. Until 2 years ago, the patient suffered from allergic rhino-conjunctivitis with grass-pollen sensitization; however, history for food allergies was negative. Total IgE levels were elevated with 132 kU/L (normal: < 100 kU/L). SPT was positive for the content of the capsule (wheel: 9 mm; erythema: 2 cm), and negative for the capsule itself. Subsequently, we performed SPTs with all separate ingredients of the supplement: only RYR was positive (wheel 7 mm; erythema: 2 cm, Fig. 3). Control SPTs with RYR performed in two healthy volunteers (SJ and MG) were negative. In the light of history, type I sensitization to RYR, and to avoid an unnecessary extensive elimination diet, the patient was advised to stop the RYR supplement. EoE-symptoms improved remarkably within several days. After 1 month, no erosions were seen in the esophagus and eosinophils were no longer increased on the biopsies.

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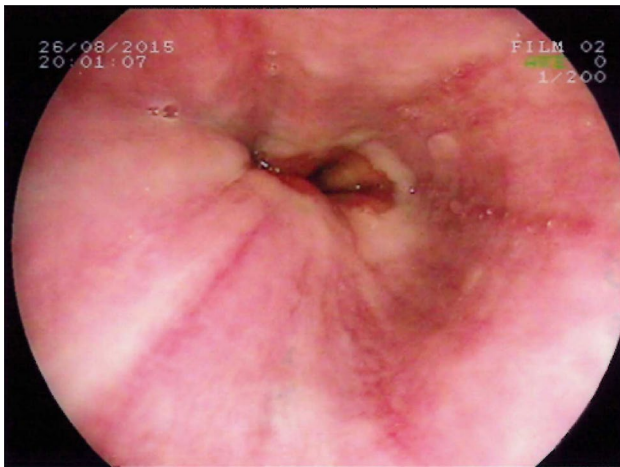


Fig. 1 Endoscopic image of the esophagus of our patient showing discrete erosions and mucosal breaks (grade A). These lesions, however minimal, could fit with eosinophilic esophagitis

Discussion

We present an unusual case of RYR induced EoE, suggested by positive skin-prick testing, and proven by cessation of symptoms following discontinuation of RYR. In Western countries, RYR is increasingly used as a natural supplement to treat hypercholesterolemia [4]. It is produced by culturing yeast on fermented rice (*Monascus purpureus*) [4]. Adverse events have been reported, including elevated liver transaminases, rhabdomyolysis, and anaphylaxis [5]. The value of allergy testing to identify food triggers in EoE is controversial, most likely because the individual contribution of IgE-mediated immediate-type reactions and other delayed cellular mediated pathomechanisms vary between patients. Previous studies in adults

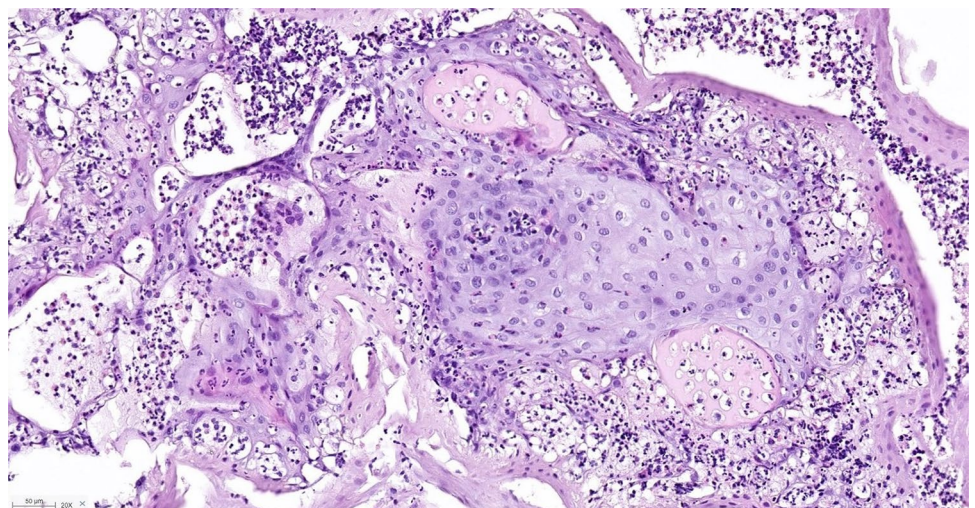
compared SPT to the gold standard of elimination diets and found that SPT identified clinically relevant food triggers for EoE in only 5–13% of cases [6]. Also, atopy patch tests in adult EoE-patients showed only low positive predictive value for identifying food allergens [6]. In our patient however, we considered the positive SPT to RYR as clinically relevant, because EoE-complaints rapidly resolved after stopping the RYR supplement and there was no recurrence over the next 2 years. The patient did not wish to perform a re-challenge with RYR.

This case highlights the potential value of thorough history taking and directed SPT in cases of highly suggestive eliciting food. Correct identification of causative allergens can circumvent unnecessary broad elimination diets. However, in most cases, a clear culprit food cannot be identified.



Fig. 3 Skin prick testing with a positive reaction after 15 min to red yeast rice: wheel 7 mm; erythema 2 cm

Fig. 2 Microscopic examination of the esophagus of our patient showing numerous eosinophils (> 50 per high power field). Hematoxylin and eosin (H&E) staining, original magnification $\times 200$



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Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interest.

Human rights All procedures followed have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed consent Informed consent was obtained from all patients for being included in the study.

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