

Chronic Rhinitis with Nasal Polyposis Associated with Sodium Glutamate Intolerance

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Key Words

Food additives • Intolerance • Polyposis, nasal • Rhinitis, chronic • Sodium glutamate

Abstract

The study reports a case of perennial rhinitis with bilateral polyposis. A careful diagnostic workup revealed that the disorder was caused by sodium glutamate intolerance. This is the first study showing an association between intolerance to food additives and nasal polyposis.

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Introduction

In spite of the bulk of published research, the etiology and pathogenesis of nasal polyposis remain to be elucidated. In some cases, associations with underlying diseases, e.g. bronchial asthma and nonspecific bronchial hyperreactivity, aspirin hypersensitivity and cystic fibrosis, have been noted, but in most cases nasal polyposis remains an idiopathic disease. Allergy and infection are two pathogenic mechanisms that have been suggested, although their involvement requires corroboration in future studies [1, 2]. We report a case of chronic rhinitis with bilateral nasal polyposis that clearly suggests that in some cases this disease may be associated with intolerance to food additives.

Case Report

A 38-year-old woman was seen in March, 2005. She had chronic obstructive rhinitis since 1990, and in 2000 she had started having hyposmia that evolved into anosmia after 1 year. Several allergologic evaluations were carried out throughout the years always with negative results. Early ear, nose and throat (ENT) examinations carried out more than 10 years ago found a 'chronic hypertrophic rhinitis' whereas the most recent one demonstrated bilateral frontal-ethmoidal polyposis grade 2 [1]. The clinical diagnosis was confirmed by CT scan. Her response to oral antihistamines and topical corticosteroids was unsatisfactory or only short lasting. At her first visit at this allergy center, she had sub-total nasal blockage and reported total anosmia. Again skin prick tests with commercial extracts (Allergopharma, Reinbek, Germany, 50,000 BU/ml) of airborne allergens including pollens (grass, mugwort, ragweed, pellitory, plantain, birch, olive and cypress), house dust mites, dog and cat dander and molds (*Alternaria*, *Aspergillus*, *Cladosporium*, *Candida albicans* and *Penicillium*) scored negative. Since the patient reported that nasal obstruction seemed to worsen after eating some preserved foods, an elimination diet (free of food additives but containing all main food allergens; table 1) was tentatively started for 3 weeks [3]. At the control visit, after 3 weeks of diet, nasal blockage had markedly improved and the patient was again able to smell some odors. Thus, an open challenge (unrestricted diet for 3 weeks) was performed; about 1 week after the reintroduction of preserved foods, nasal symptoms were relapsing, worsened progressively and at the end of the open challenge period, severe nasal blockage and total anosmia had recurred. The additive-free diet was resumed and, again, symptoms gradually improved. After about 6 weeks of additive-free diet, during which the woman reported a regular and gradual improvement, double-blind, placebo-controlled peroral challenges with food additives were performed. Details on the

Table 1. Additive-free diet prescribed at the Allergy Unit of the Clinica San Carlo (Italy)

<i>Flours, pasta, bread and cereals</i>	
Allowed	fresh bread, pasta (both commercial and home made), rice, barley, flours (wheat, maize and rice), homemade cookies and pizza
Forbidden	commercial biscuits and cookies, precooked ready-to-use frozen pastas, canned pastas, commercial filled pastas (e.g. ravioli or tortellini), commercial sauces and condiments for pastas, commercial pizzas, cornflakes and other breakfast cereals
<i>Fruits and vegetables</i>	
Allowed	any fresh vegetables and fruits but walnut; it is advisable to peel fruit whenever possible
Forbidden	jam, marmalade, commercial juices, canned fruits and vegetables, pickles, vegetables in oil, ketchup, mustard and other sauces
<i>Dairy products</i>	
Allowed	fresh milk, natural yogurt and true parmesan cheese
Forbidden	margarine, any cheese other than parmesan, yogurts with fruits, cereals or malt
<i>Eggs</i>	
Allowed	fresh eggs
Forbidden	commercial mayonnaise, egg-based sauces and seasonings
<i>Meat & Fish</i>	
Allowed	fresh meat (beef, pork and poultry), fresh fish and shellfish (but not crustaceans)
Forbidden	salami, bacon, ham and any kind of preserved meat, corned beef, commercial precooked meatballs, bouillon cubes, meat extracts, smoked fish, pickles, stockfish, canned fish, caviar
<i>Oils</i>	
Allowed	olive oil
Forbidden	all other oils
<i>Beverages</i>	
Allowed	water, freshly brewed coffee and tea
Forbidden	wine, beer, alcoholic beverages, soft drinks, vinegar
<i>Sweeteners</i>	
Allowed	cane sugar
Forbidden	white sugar, sweeteners (e.g. aspartame)

substances and doses given, which were chosen based on a presumptive daily consumption [4–6], are shown in table 2. The patient continued the additive-free diet throughout the study period. Single additives and multiple placebos were challenged at least 1 week apart in a randomized sequence. Both active substances and placebos were given in identical opaque capsules. The patient was monitored for 1 h after each challenge. An informed, written consent was obtained before the start of the procedure.

Table 2. Food additives used in oral challenge tests

Additives	Dose, mg
Sodium metabisulfite	25
Sodium benzoate	50
Sodium glutamate	100
Sodium nitrate	10
Tartrazine	10
Erythrosine	10
Sorbic acid	100
Butylated hydroxyanisole	10
Talc (placebo)	100

About 24 h after the administration of 100 mg of sodium glutamate, nasal itching, rhinorrhea and sneezing occurred and lasted for about 24 h. None of the other substances induced nasal symptoms. In order to confirm this finding, the patient was again challenged with sodium glutamate and two placebos in a double-blind, placebo-controlled, randomized manner, 3 weeks after the previous challenge series. Again, 24 h after the ingestion of 100 mg of sodium glutamate, nasal obstruction and sneezing occurred, this time lasting 3 days. Placebos did not induce any reaction. Sodium glutamate intolerance was diagnosed, and the patient continued on a specific glutamate-free diet regimen. After 2 months, an ENT investigation revealed that the nasal polyps were no longer noticeable and nasal mucosa showed normal appearance.

Discussion

Evidence from properly performed studies is accumulating that intolerance to food additives may play a role in perennial rhinitis [7–10]. Most cases reported so far were associated with sodium benzoate [7, 9, 10], but cases of sodium-glutamate-induced rhinitis have also been observed [9]. Our patient suffered from a long-standing rhinitis eventually complicated by bilateral polyposis. In agreement with previously described cases [7, 9], nasal symptoms occurred several hours after the administration of a single dose of the offending additive and symptoms were rather long lasting. The novel and most interesting finding in this case is the total disappearance of both polyps and rhinitis following the additive-free diet. The clinical outcome observed in this patient suggests that the chronic nasal inflammatory process resolved following the exclusion of the offending additive. Sodium glutamate is widely used by the food industry. Soup cubes, gummy candies, cereals, crackers and salty snacks, roasted nuts and seeds, ice cream, canned meats, hot dogs, ham, aspic and commercial stuffed pastas (e.g. tortellini

or ravioli) are only some examples of foods that may contain this flavor enhancer. Further, it is extremely common in Chinese cuisine. While the pathogenesis of chronic nasal inflammation induced by food additives remains to be elucidated, the present study suggests that some cases of polyposis might in effect be caused by food additive

intolerance. Although further studies in a larger number of patients are needed to confirm these observations, ENT specialists and allergologists should consider the possibility to try a harmless additive-free diet in patients with nasal polyposis before referring them to surgical treatment.

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