

Resolution of Allergic Rhinitis and Reactive Bronchospasm With Supplements and Food-specific Immunoglobulin G Elimination: A Case Report

Laura Kwiatkowski, ND; Jessica Mitchell, PhD; Jeffrey Langland, PhD

ABSTRACT

Context • Allergies are a common affliction, whether they are respiratory, food related, or dermatological. People often resort to continuous use of over-the-counter medications, such as antihistamines, to manage their symptoms. Controversy still remains over testing serum immunoglobulin (Ig) G to diagnose food allergies

Objective • This study intended to examine the benefits of treatment of a pediatric patient with natural supplements and an elimination diet for IgG food allergies.

Design • The research team reported a case study.

Setting • The study was conducted at Southwest Naturopathic Medical Center (Tempe, AZ, USA).

Participant • The participant was a 10-y-old Caucasian female who had diagnoses of allergic rhinitis and reactive bronchospasm, the second of which was exacerbated by allergens such as wheat, perfumes, and seasonal flora.

Intervention • Following testing for IgE- and IgG-reactive foods, the patient was treated with natural supplements to reduce her allergic responses and was instructed to make dietary changes to eliminate the IgG-reactive foods.

Outcome Measures • The patient's symptom severity was tracked starting 1 mo after her initial visit to Southwest Naturopathic Medical Center. The severity was based on the patient's subjective reports about her congestion to her mother and on her mother's observations of the effect of symptoms on her attention and school performance. The bronchospasm severity was based on the frequency of a sensation of wheezing and chest tightness, the frequency of inhaler use, and the occurrence of any exacerbation of symptoms with acute respiratory illness

Results • After 1 mo, in which the patient used the natural supplements, she experienced a 90% improvement in coughing; a 70% improvement in nasal congestion; less chest tightness; and no need for use of loratadine, diphenhydramine, or albuterol. At the 8-mo follow-up visit, her nasal congestion was reported to be entirely gone.

Conclusions • The case demonstrates the effectiveness of natural supplements and a diet eliminating IgG-reactive foods in the treatment and management of pediatric allergic rhinitis and reactive bronchospasm. (*Altern Ther Health Med.* 2016;22(S3):24-28.)

Laura Kwiatkowski, ND, is a resident physician at the Southwest College of Naturopathic Medicine in Tempe, Arizona. Jessica Mitchell, ND, is an associate dean of clinical education at the Southwest College of Naturopathic Medicine. Jeffrey Langland, PhD, is the research department chair at the Southwest College of Naturopathic Medicine and a research assistant professor at Biodesign Institute, Arizona State University, in Tempe, Arizona.

Corresponding author: Jeffrey Langland, PhD
E-mail address: j.langland@scnm.edu

Approximately 11% of children under the age of 18 years suffer from respiratory allergies in the United States.¹ Allergic rhinitis is an inflammatory condition thought to be mediated by immunoglobulin (Ig) E, with symptoms often including nasal congestion, clear rhinorrhea, pruritic nose, and sneezing.² Rhinitis occurs from exposure to indoor and outdoor allergens, including animal dander, dust mites, mold, and pollens as well as food allergies such as eggs, dairy, peanut, soy, and wheat.^{2,3} Bronchospasm is a hallmark symptom of asthma, and some epidemiological evidence suggests a strong relationship between allergic rhinitis and asthma. Rhinitis typically precedes asthma, and some research has suggested the idea of a united airway, where allergic, upper- and lower-respiratory conditions are manifestations of a common atopic syndrome.^{4,5}

Conventionally, practitioners recommend that patients with allergic rhinitis avoid exposure to allergens and prescribe pharmacological treatments that may include intranasal corticosteroids or intranasal or oral antihistamines.⁶ Antihistamines are commonly prescribed for symptoms of allergic rhinitis because elevated IgE and histamine correlate with early-phase itching, sneezing, and rhinorrhea.

In addition, nasal congestion is a common late-phase response in allergic rhinitis and has been correlated with increased leukotrienes—LTC₄ and LTD₄—that increase nasal blood flow, mucosal swelling, and nasal air resistance. Montelukast is a pharmaceutical that is commonly prescribed to assist in reduction of allergic rhinitis, particularly nasal congestion.

Some studies have compared the effectiveness of loratadine versus montelukast, with the medications showing a comparable and significant improvement in symptoms when used as a single therapy.^{7,8} Patients with bronchospasm are routinely prescribed a β -2 agonist to use as needed, typically an albuterol inhaler.

Some research has supported the use of natural treatments for allergic rhinitis, such as quercetin and the herb, *Urtica dioica*.⁹ Quercetin and *U dioica*, as well as vitamin C, bromelain, and N-acetyl-cysteine (NAC), have been shown to reduce allergic responses and associated inflammation.⁹ Several studies have shown that vitamin C (ascorbic acid) plays a significant role in decreasing serum levels of histamines as well as reducing bronchial responsiveness to histamines for patients with allergic rhinitis.^{10,11}

Quercetin is an inhibitor of mast cell degranulation, and studies have shown its therapeutic potential in allergic airway inflammation.^{12,13} In vitro studies have shown that extracts of the botanical *U dioica* have negative agonist activity against the histamine-1 receptor, subsequently reducing the release of proinflammatory mediators.¹⁴

A randomized, double-blind study of *U dioica* has demonstrated that patients who took the botanical had greater symptom relief for allergic rhinitis than did a placebo group.¹⁵ Some evidence exists for both bromelain and NAC for use as mucolytic agents; they are supportive of the mucus membranes and helpful for many respiratory conditions.¹⁶⁻¹⁸ The evidence for the supplements supports their therapeutic use and substantiates the symptom relief observed in the current case.

In addition to supplements, elimination of allergenic foods from a patient's diet can aid in treatment. It is well known that a relationship exists between IgE-mediated food allergies and atopy.¹⁹ Controversy still remains over testing serum IgG to diagnose food allergies.^{20,21} However, many clinicians are becoming aware of the likelihood of delayed onset of non-IgE food reactions and have observed clinically positive results using elimination diets for IgG food allergies in many different conditions, such as asthma and irritable bowel syndrome (IBS).^{22,23}

The current study intended to examine the benefits of treatment of a pediatric patient with natural supplements and an elimination diet for IgG food allergies.

METHODS

Participant

The patient was a 10-year-old Caucasian female, who was 146 cm tall and weighed 36.7 kg who experienced nasal congestion, coughing, wheezing, and chest tightness. Her family had moved from the east coast to Arizona with hope that her allergies would improve, but her symptoms were no different in Arizona.

The family was middle class, and no one smoked in the house. The patient had a HEPA filter in her bedroom for removal of household allergens from dust and dogs, but it did not provide any significant change in her symptoms.

The family history included environmental allergies, particularly seasonal ones, and known allergens included sulfa drugs. Her nasal congestion had been consistent every day for the 2 years prior to the study, and she was alleviating her symptoms with daily 10-mg doses of loratadine.

She also had been experiencing reactive bronchospasm with symptoms such as coughing, wheezing, and chest tightness for the 2 years prior to the study. Although never diagnosed with asthma, the patient was given an albuterol inhaler to use as needed. At the time of her first visit to Southwest Naturopathic Medical Center (Tempe, AZ, USA), she was taking diphenhydramine (12.5 mg) 1 to 2 times per week and using her albuterol inhaler 1 to 2 times approximately every 2 months for the wheezing and chest tightness.

Her triggers for bronchospasm appeared to be related to the ingestion of certain foods, such as wheat, carrots, and high-fructose corn syrup as well as exposure to perfumes, seasonal flora, and animal dander. She had received no prior allergy testing before her initial visit.

Procedures

At the patient's initial visit, her naturopathic physician performed a physical examination that included a head, eye, ear, nose, and throat exam and cardiovascular, respiratory, thyroid, abdominal, and integumentary examination. All findings were within normal limits.

At that visit, an enzyme-linked immunosorbent assay (ELISA) was ordered to test the patient's serum levels of IgG and IgE against 96 food antigens (US BioTek Laboratories, Seattle, WA, USA). The IgG and IgE antibodies are detected through spectrophotometric analysis and the total IgG level consists of subclasses of IgG₁–IgG₄. The level of food reactivity was classified from 0 (no reactivity) to 6 (extreme reactivity).

The patient's reactive foods for class 1 and higher were as follows: (1) class 1 and greater specific IgE—none, (2) class 3 specific IgA/IgG—grapefruits and oranges, and (3) class 4 and greater specific IgA/IgG—chicken egg white, chicken egg yolk, duck egg whole, spelt, wheat gliadin, wheat gluten, and whole wheat.

Interventions

The treatments for the patient included natural supplements and dietary elimination to treat her IgG food allergies. At her initial visit, the patient was instructed to take

the supplements on an ongoing basis, particularly in the spring when seasonal allergies are at their worst.

At her 1-month follow-up visit, the results from the ELISA were discussed, and she was instructed to eliminate the IgG-reactive foods that were class 3 and higher, specifically wheat, gluten, eggs, and citrus.

The supplementation included products to decrease her allergic response by stabilizing mast cells and decreasing inflammation. At her initial visit, the practitioner recommended the following products (Table 1): (1) 2 antihistamine tablets (D-Hist Jr, Ortho Molecular, Woodstock, IL, USA) twice daily; (2) 2 g daily of fish oil (Barlean's, Ferndale, WA, USA); (3) 1 probiotic tablet twice daily (Klaire, Ther-Biotic Children's Chewable, Reno, NV, USA); and (4) 1000 IU daily of vitamin D₃ (Pure Encapsulations, Sudbury, MA, USA).

Outcome Measures

The patient's symptom severity was tracked starting 1 month after the initial visit. The severity was based on the patient's subjective reports about her congestion to her mother and on her mother's observations of the effect of symptoms on her attention and school performance. The bronchospasm severity was based on the frequency of a sensation of wheezing and chest tightness, the frequency of inhaler use, and the occurrence of any exacerbation of symptoms with acute respiratory illness.

RESULTS

After 1 month in which the patient used the natural supplements, she experienced a 90% improvement in coughing; a 70% improvement in nasal congestion; less chest tightness; and no need for use of loratadine, diphenhydramine, or albuterol (Figure 1). After 3 months of supplementation and 2 months of elimination of the IgG foods, all of her symptoms further improved, and she still had no need for any of her previous medications.

At the 5-month follow-up, the patient reported a recent acute, upper-respiratory infection that had lasted 3 days. During the infection, she did not need any additional conventional medications, whereas in the past after similar acute infections, she had reported that she would have a lingering cough for up to 3 weeks and would need medications for relief of respiratory symptoms.

At the 8-month follow-up, her nasal congestion was reported to be entirely gone. For a brief period, she experienced chest tightness, cough, and wheezing following the consumption of some IgG allergenic foods over a holiday period. She had needed to use her albuterol inhaler 2 to 3 times within a few days of eating those allergenic foods.

DISCUSSION

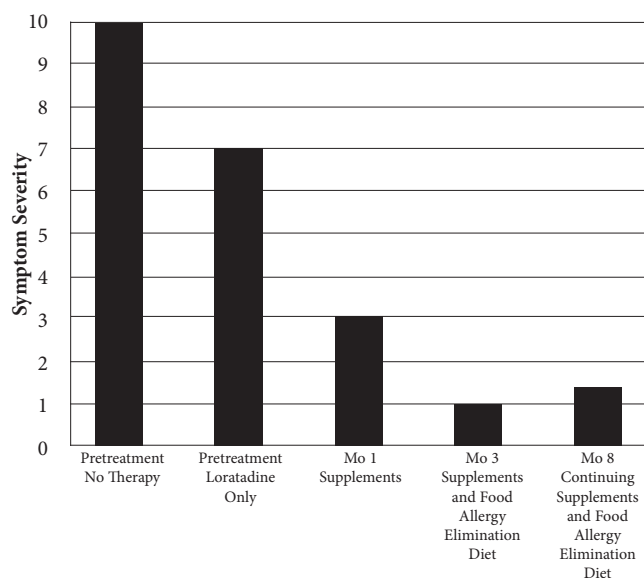
The current case illustrates the successful treatment of a pediatric patient who had allergic rhinitis and reactive bronchospasm. The significant resolution and management of the patient's condition provide supportive evidence for the effectiveness of natural supplements and for elimination of

Table 1. Dosages of Recommended Supplements

Supplement	Per Tablet	Dosage
Antihistamine		2 tablets 2×/d
Vitamin C (ascorbic acid USP)	75 mg	
Quercetin dihydrate	100 mg	
Stinging nettles leaf	100 mg	
Bromelain (2400 GDU/g, from pineapple)	25 mg	
N-acetyl-L-cysteine USP	12 mg	
Vitamin D ₃		1000 IU/d
Fish oil		2 g/d
Probiotic	25 billion CFUs	1 tablet 2×/d

Abbreviations: USP, United States Pharmacopeia; GDU, gelatin digesting unit; CFU, colony-forming unit.

Figure 1. Severity of nasal congestion based on intervention and results in the course of treatment. The symptom severity of the patient's nasal congestion was evaluated on a scale of 0–10 (0, no congestion and 10, severe congestion). The severity was based on subjective congestion as reported by the patient to her mother and on the mother's observations of the effect of the symptoms on the patient's attention and school performance. The timing and interventions are listed on the x-axis.



foods triggering IgG food allergies as opposed to continuous symptom management with pharmaceutical interventions.

The patient demonstrated substantial improvement in respiratory symptoms, especially nasal congestion, with natural supplements exclusively, and the symptoms improved even further when elimination of the IgG foods was initiated. The current study illustrates the positive synergism of those combined approaches. The improvement was so significant that the patient was able to discontinue her regular use of loratadine and diphenhydramine.

It should be mentioned that montelukast, a common pharmaceutical for allergic rhinitis, would be an acceptable

conventional intervention. A study in children with allergic rhinitis compared the effectiveness of loratadine as opposed to that of a combination of loratadine and montelukast in a randomized, placebo-controlled trial with 1 week of a single-blind trial and 2 weeks of a double-blind controlled trial. The results demonstrated that no significant difference existed in the reduction of symptom severity during the day with the loratadine only as opposed to the combination of loratadine and montelukast. Although the combination therapy provided a slight, but not statistically significant, improvement in symptoms at night, a statistically significant decrease in the turbinate swelling did occur.²⁴

Had the current patient pursued conventional treatment, montelukast may have been prescribed with a possible positive therapeutic response of a decrease in nasal congestion as opposed to an over-the-counter use of loratadine only or of natural therapies at the current research team's clinic. Montelukast could be considered as a future additional treatment together with natural therapies if the patient's symptoms should begin to be aggravated or to become refractory to natural therapies. Its effectiveness for nasal congestion in allergic rhinitis as well as asthma has been well established.^{7,8,24}

Evidence regarding IgE-mediated food allergies and allergic rhinitis is available, but correlational studies have shown that patients with higher levels of IgG₁:IgG₄ also had higher total IgE levels.^{19,25} Research has demonstrated the ability of IgG-food elimination to reduce symptom severity for IBS, asthma, and migraines.^{22,23,26} Although little research is available to support the use of diets that eliminate foods causing IgG food allergies, clinicians have recognized their therapeutic potential for many chronic conditions. One study investigated food-specific IgG-antibody levels in healthy and symptomatic adults with conditions such as asthma, IBS, migraines, eczema, urticaria, rhinitis, and arthritis. That study reported that food-specific serum-IgG concentrations were highly variable and noncorrelative among healthy and symptomatic adults.²⁷ Such variable results support the necessity of testing food-specific IgG antibodies on a case-by-case basis as well as the need for additional research.

In a recent article, Vojdani²⁸ reviewed the evolution of food-reactivity testing. The author cited many peer-reviewed publications that supported the value of IgG food testing when done under rigorous conditions, such as ensuring the purity of the food antigens used for the ELISA testing. An extremely wide variation in the results for IgG-reactive foods can be found across laboratories if they do not use the same purity standards or proper procedures to report reproducible and reliable assays.²⁸

For the current patient, testing IgG-reactive foods with blood draws on separate dates, as well as with multiple laboratories, would have strengthened the case for elimination diets, with increased reliability, provided that the same IgG foods showed up as positive at each laboratory. If the current research team had followed such a path, the current investigation would have been expensive for the patient and would have subjected her to more blood draws, which was not an ideal situation.

The patient's improvement with the avoidance of the IgG-reactive foods found by the laboratory that the current research team used is strong clinical evidence that supports the validity of the testing procedures. Additional supportive lab testing could include testing serum total IgE and eosinophils to monitor allergic responses before and after treatment. If a flare of symptoms had occurred when the current patient was not being compliant with treatment, the team could have tested serum total IgE and eosinophils at that time and then tested levels again after she had been consistent with treatment to see if a reduction in levels had occurred after therapy.

In the current case, a correlation between the patient's symptom improvement and the elimination of IgG foods was observed, and her symptoms were entirely resolved after eliminating foods with the IgG-specific allergens, with the addition of natural supplements.

The current study also demonstrates the synergistic effects of using multiple natural therapies to achieve a therapeutic goal. The patient's symptoms improved with natural treatments during the first month in which she used the supplements only before starting the food elimination, but she had only partial improvement. It is possible that the patient may have improved further if the research team had extended the phase with natural supplements only a few more months.

It is also possible that the patient may have improved solely from food elimination only. However, the clinical therapeutic approach was to reduce symptoms by both methods to reach a symptom-free state more quickly. The team's conclusion was that the combination of natural supplements and food elimination brought the patient to a symptom-free state sooner than either therapy alone would have.

The patient was instructed to eliminate the foods permanently, although ongoing dietary restrictions are especially difficult in a pediatric population. Therefore, the natural supplements provided additional support when the patient was noncompliant.

Further evidence supporting that the benefits of the supplements was the fact that they reduced the patient's symptoms better than the loratadine prior to initiating food elimination. In support of the need to regulate IgG-reactive foods, an exacerbation of the patient's bronchospasm occurred when she was noncompliant with her diet, and she needed to use her albuterol inhaler shortly after the consumption of class 3 and higher IgG-reactive foods. That specific response again supports the effectiveness of the current patient's treatment with both a diet eliminating IgG-reactive foods and natural supplements.

CONCLUSIONS

Although this article discusses only a single case study, the results are supportive for building a body of evidence for treatment of allergic rhinitis and reactive bronchospasm with natural supplements and the removal of IgG-reactive foods. In the future, a larger study could be considered for patients with allergy-related conditions using the natural therapies as effective alternatives to conventional pharmaceutical interventions.

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