
Nutrient Support to Minimize the Allergic Cascade

Chris D. Meletis, N.D.

The symptoms that are associated with an allergic response serve an important and significant role—to flush out irritants that challenge the body's well-being. However, when the allergic cascade gains too much momentum, the surge of histamine, leukotrienes, and other biochemical mediators can trigger an overwhelming avalanche of symptoms.

Currently, the trend in the United States is towards increased reactivity and there is a significant per capita rise of allergy-based conditions. Among the most common are hayfever, extrinsic asthma, allergic rhinitis, dermatitis, and sinusitis. It is estimated that 3 percent of the U.S. population suffers from one of the most severe forms of allergic reaction, extrinsic asthma. The overall rise in frequency of clinically significant reactions has been attributed to a triad of factors: total allergic burden, enhanced reactivity, and decreased resistance.

When addressing allergic symptoms clinically, removal of the offending agent(s) is critical to successful long-term treatment. It is equally critical to nourish the body so that it is capable of maintaining control over the allergic and inflammatory responses that it faces on a daily basis.

Total Allergic Burden

It is the total allergic burden that one is exposed to that results in the manifestation of cumulative symptoms. When environmental, food, and airborne particles are combined, they form a large enough burden to cross an allergic reaction threshold that otherwise might not have

been reached. Often, simply by limiting any allergen category, symptom relief can be achieved.

Environmental Exposures

The average patient today is faced with a total allergic burden that is often significantly higher than that faced by people in previous generations. The prevalence of food additives, environmental chemicals used for household cleaning and for pest control, and the off-gassing of many home and office products puts a constant burden on our bodies to detoxify in order to maintain good health. Additionally, aspirin and other nonsteroidal anti-inflammatory drugs, that are often used to control the aches and pains of modern life, can actually cause excess leukotriene production in sensitive patients.¹ These combinations can result in a cascade of allergic responses.

Food Triggers

The daily consumption of tartrazine (yellow dye #5, which is found in many processed foods), sulfites, and other food additives elevate leukotriene levels. Additionally, antimetabolites such as tartrazine diminishes the ability of vitamin B₆ and other nutrients to function in critical biochemical pathways such as tryptophan/serotonin metabolism. In the case of tartrazine, the alteration in tryptophan and serotonin metabolism can be significant enough to manifest allergic symptoms.²

Regardless of food additives, immunoglobulin E (IgE) and immunoglobulin G (IgG) mediated allergic reactions frequently occur with certain foods. Among the most prevalent immediate reactions (IgE) are often to eggs, fish, shellfish, nuts, peanuts. Common delayed reactions (IgG) are to milk, chocolate, wheat, and citrus.³ Food allergy testing is very helpful clinically when addressing an indi-

vidual patient's overall allergen burden and specific sensitivities.

Airborne Allergens

Although approximately 75 percent of hayfever is attributed to ragweed pollen, numerous other airborne irritants trigger allergic symptoms. Because of the seasonal nature of hayfever, identifying allergens can sometimes be made easier. Springtime allergies are most often associated with tree pollen; summer allergens occur with grass and weed pollen. Regardless of specific seasonal allergens, dust mites, animal dander, mold, and mildew are often an ever-present drain on the body's defenses. When baseline offending antigens are removed from the irritant load, seasonal allergies are usually lessened.

Enhanced Reactivity

Inherently, all patients have a degree of allergic responsiveness, yet certain medical conditions can enhance the level of reactivity. Conditions that frequently manifest with greater sensitivity include intestinal permeability disturbance, adrenal fatigue, digestive disturbances, and hypochlorhydria as well as conditions that are related to prolonged or frequent antibiotic use or stress. Of particular interest regarding today's fast-paced existence is the confounding variable of stress. Stress reduction and nutrient support can help to restore more optimal cortisol and epinephrine levels, helping to lessen reactivity levels.

Decreased Resistance

When the body is worn down, either through physical or mental stress, there is a decreased resistance to allergic triggers. Of particular significance are the studies demonstrating that food allergens tend to worsen from stress-induced decreases in secretory immunoglobulin A (sIgA).⁴

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Associated with the decrease of sIgA is an increased absorption of food antigens. Patients who suffer from food allergies commonly have unusually low levels of sIgA.⁵

Clinically, patients who suffer from food allergies frequently present with an increased susceptibility to environmental triggers, and vice versa. These findings reinforce the reality that indeed an additional "straw" can break the "camel's back" of the body's biochemical balance.

Moderate avoidance and control of these factors can offer meaningful relief for many patients. Allergic symptoms should most likely be considered as merely signs that greater imbalances and underlying conditions are likely to be present. There are a number of nutrients that can be added to the diet when underlying disease is determined or for alleviating symptoms.

Nutrient Intervention

Bioflavonoids

Flavonoids serve many functions in the human body, especially as antioxidants. They have also been shown to inhibit histamine release from mast cells and decrease leukotriene synthesis.⁶ Quercetin is often considered to be the "gold standard" for flavonoids when it comes to treating allergic conditions and, indeed, clinically, it works reliably. Quercetin has been shown to stabilize mast cells and basophils, lessening degranulation and release of histamine and other inflammatory mediators.⁷ Studies also support quercetin's ability to inhibit several enzymes that can lessen inflammatory response.⁸ Quercetin also decreases leukotriene formation by altering eicosanoid metabolism.⁹ Consuming flavonoids in the form of green tea, grape-seed extracts, and *Ginkgo biloba* can also prove to be helpful to your patients.

| Nutritional Supplementation Guidelines | |
|--|--|
| Carotenes | 25,000–75,000 IU ^a per day |
| Flavonoids | |
| <i>Ginkgo biloba</i> (24% standardized) | 240–360 mg per day (in divided doses) |
| Grapeseed (90–95% procyanidolic oligomers) | 150–300 mg per day (in divided doses) |
| Green tea (50% polyphenol content) | 900–1200 mg per day (in divided doses) |
| Quercetin | 1200–1500 mg per day (in divided doses) |
| Molybdenum | 25–50 µ per day |
| Niacin | 100–200 mg per day (in divided doses) ^b |
| Pantothenic Acid | 750–2000 mg per day (in divided doses) |
| Pyridoxine | 50–100 mg per day |
| Selenium | 100–200 µ per day |
| Vitamin C | 1000–2000 mg per day |
| Vitamin E | 400–800 IU per day |
| Zinc | 15–45 mg per day |

^aIU, international units; ^bUse cautiously in patients with liver disorders.

Calcium

Intravenous calcium in a double-blind crossover study was shown to help patients with allergic rhinitis. After receiving 9 mmol of calcium IV, an allergen load equal to 170 percent of baseline was required to trigger the same level of reaction.¹⁰

Carotenes

Pigmented fruits and vegetables can offer patients symptomatic relief while supporting their immune systems. Leukotriene formation can be decreased with carotene supplementation. Carotenoids also play vital roles as antioxidants and in maintenance of health and respiratory-tract resilience.¹¹

Catechin

Oral supplementation with catechin can inhibit histidine decarboxylase, the enzyme that converts histidine to his-

tamine. Patients who received catechin prior to a food-antigen challenge did not experience an increase of histamine in the gastric mucosa.¹² An additional benefit is that catechin helps to support healthy liver function that, in turn, can help to control the body's total toxic load.

Essential Fatty Acids

Supplementation with omega-3 fatty acids improves the ratio of omega-3 to omega-6 fatty acids in cell membranes. With a more optimal ratio, cell membrane arachidonic acid is reduced. Consuming omega-3 fatty acid has been associated with a shift to less inflammatory leukotriene pathways. This shift has been associated with decreased allergic symptoms, particularly in patients who suffer from asthma.¹³ In a supporting study, it was demonstrated that children with asthma who consumed fish more than once a week had one third the likelihood

Use of olive oil may lessen allergic symptoms.

Limiting Allergic Symptoms

Helpful Hints for Your Patients

- Wash hair prior to bed (to wash pollen away).
- Avoid down comforters/pillows (common sources of dust mites).
- Avoid mucous-forming foods (e.g., bananas, citrus, peanuts, dairy items).
- Drink 6–8 glasses of water per day (to keep mucous membranes healthy and mucus flowing).

of developing or showing the symptoms of asthma compared to children who did not eat fish.¹⁴ With sufficient essential fatty acid intake, immune function is also optimized and mucous membranes are less susceptible to infection.

Molybdenum

Sulfite allergies plague thousands of Americans; it has been theorized that molybdenum deficiency could in part be responsible for the prevalence of sulfite sensitivity. Molybdenum is required for the proper functioning of sulfite oxidase, the enzyme that is essential for neutralizing sulfite. Ensuring sufficient molybdenum intake might be a worthwhile consideration, because 2–3 mg of sulfites are consumed daily by the average American, with beer and wine drinkers ingesting an additional daily 5–10 mg per day.^{15,16}

Niacin

There is some preliminary research suggesting that niacin may lessen histamine reaction. Niacin appears to have the ability to lessen histamine induced constriction, as demonstrated in a study involving isolated guinea-pig lungs.¹⁷ Another possible mechanism may be similar to that seen in capsaicin and substance P depletion. The well-known side effect of flushing from niacin ingestion, is

caused, in part, by the release of histamine. These symptoms diminish during the course of niacin use. The mechanism of action for allergy-relieving properties of niacin may arise, in part, from the sustained depletion of histamine caused by the treatment.

Oleic Acid

Use of olive oil may lessen allergic symptoms. Omega-9 fatty acid supplementation may inhibit histamine release.¹⁸

Pantothenic Acid

Vitamin B₅ proves to be helpful for minimizing the symptoms associated with allergies while helping the body to modulate its response to allergens. Pantothenic acid has been reported to lessen mucus production, stuffiness, and mucous membrane irritation.^{19,20} Additionally, this vitamin helps to support optimal adrenal gland and immune function and improves body's response to stress.

Pyridoxine

Monosodium glutamate reactivity may be downregulated with vitamin B₆ supplementation.²¹ People with asthma, in general, can also benefit from supplementation because sufficient B₆ is essential in helping to achieve optimal intracellular magnesium levels, a state that helps to relax bronchial smooth muscle.

Selenium

Patients with asthma have lowered selenium levels, which is significant considering that glutathione peroxidase is a selenium-dependent enzyme that is essential for breaking down leukotrienes. Studies have confirmed the correlation between low selenium levels in asthmatic patients and lowered glutathione peroxidase.²² The resultant inability to break leukotrienes down properly leads to airway irritation and increased reactivity to allergic challenges.

Vitamin C

Vitamin C, the major antioxidant that is present in the lining of the respiratory tract, aids in mitigating allergic symptoms.²³ Research has shown that people with asthma have significantly lower levels of vitamin C in their blood, compared to people without asthma.²⁴ Supplementation with 1–2 g of vitamin C daily can improve symptoms of asthma. In addition to the antioxidant protection conferred by vitamin C, regular use helps to lower histamine levels.²⁵ In one study, when 1000 mg of ascorbic acid was administered orally for 3 days, there was histamine reduction in each patient.²⁶ It was also noted that bronchial reactivity to histamine in patients suffering from allergic rhinitis was lessened after administration of 2000 milligrams of vitamin C.²⁷

Vitamin E

As an antioxidant, vitamin E helps to stabilize membranes and protect the body against pollutants and irritants. Tocopherol also helps to modulate leukotriene synthesis.²⁸ Clinical trials have suggested that pretreatment with vitamin E can minimize histamine response posthistamine-injection challenge.²⁹

Zinc

Studies of patients with chemical sensitivities have illustrated that erythrocyte zinc levels may be low in these people.³⁰ In vitro studies confirm that there is a dose-dependent relationship between zinc level and the inhibition of histamine and leukotriene.³¹

Conclusion

The average American is bombarded with a myriad of allergic burdens. The level of reactivity in an individual is dependent upon overall health, stress load, and underlying physiologic imbalances related to gastrointestinal health and functioning and total allergen exposure.

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It seems to be inevitable that stress and allergic burdens will remain higher than desired for most of our patients. Thus, the mindset that has proven to work best from my clinical experience is to tackle the things that are changeable. Suggest moderation in consumption of common allergens or, better yet, identify unique individual allergens through testing. Tell your patients to limit sources of continual burden, such as down comforters, feather pillows, mildew around windows and showers, and other common triggers. Advise patients to keep pets off the bed and to wash their hair prior to going to bed. Throughout the day, dust and pollen collects on pets and hair; these allergens are then inhaled during sleep. Instruct your patients to avoid foods that are known to increase mucus and explain that increasing fluid intake also can help a good deal. Nourishing the body to meet an allergic challenge is also critical. For instance, taking 1000 mg of vitamin C prior to mowing the lawn can make a big difference.

When selecting nutrients as adjuncts to other current allergy treatments, I have found that, if a specific nutrient is indicated for other health complaints in the same patient, efficacy is usually substantially better. An example might be a 50-year-old male with benign prostatic hyperplasia and white lines on his finger nails. Often this patient's allergic symptoms will respond better to zinc than the symptoms of an individual without apparent zinc nutrient needs. □

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Chris D. Meletis, N.D., serves as the dean of clinical affairs/chief medical officer, National College of Naturopathic Medicine, Portland, Oregon.

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