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Food Allergy Newsletter II

Celiac Disease is an Autoimmune Disease

The importance of obtaining an accurate diagnosis cannot be overemphasized. Celiac disease, wheat allergy, Non-Celiac gluten sensitivity, and irritable bowel syndrome are different conditions, requiring unique treatment options and presenting different outcomes. Before jumping into a gluten-free diet, the correct diagnosis must be confirmed through patient history, blood tests, small intestine biopsy, or even genetic testing. The correct diagnosis is crucial for long-term management of each specific disorder.

The name Celiac derives from the Greek word for “hollow,” as in the bowels. Celiac disease or gluten intolerance is an autoimmune disorder, not an IgE-mediated food allergy, because it is a result of gluten hypersensitivity. Therefore, a skin test is not useful. The symptoms of Celiac disease are quite different from a food allergy. Symptoms include poor absorption of nutrients by the intestines, impaired growth, abnormal stools, abdominal distension, poor appetite, and irritability. In adults, the symptoms may be quite varied, from severe weight loss and diarrhea to subtle abdominal complaints.

Celiac disease affects about one percent of the U.S. population. Typically, celiac disease symptoms manifest themselves at six to twenty-four months of age, following the introduction of gluten into the diet. Gluten is a protein in cereal grains and is comprised of gliadins and glutenins. When people with special genes (HLA DQ2 and/or DQ8) eat wheat, barley, or rye containing gluten, their immune system forms autoantibodies to gluten which, in turn, causes inflammation and attack of the intestinal lining. Absorption of the nutrients in food throughout the intestines is, therefore, affected. Patients with celiac disease are also commonly affected by other kinds of autoimmune diseases.

Almost all people with Celiac disease have autoantibodies (IgA anti-tissue transglutamine and IgA anti-endomysium). Because ninety-five percent of people with Celiac disease have genes of HLA-DQ2 and five percent have HLA-DQ8, if you do not have HLA-DQ2 or HLA-DQ8, it is very unlikely that you will develop Celiac disease. Though twenty-five to forty percent of the United States population carries either the DQ2 or DQ8 genes, only two to three percent of all people with these genes will ever go on to develop Celiac disease. Therefore, the presence of either gene alone is not a guarantor of developing Celiac disease.

On some occasions, genetic testing is very helpful to rule out celiac disease. However, the first step for patients with symptoms suggestive of celiac disease is blood tests for gluten autoantibodies—anti-endomysial (anti-EMA), anti-tissue transglutamine (anti-TTG), and Deamidated Gliadin Peptide (anti-DGP). If those auto antibodies are positive, then a small bowel biopsy is necessary to assess mucosal lining damage and confirm the diagnosis. Because it only takes several days for the intestinal lining to show improvement, auto antibodies measurement and the results of the biopsy are accurate only when patients are on a gluten-containing diet.

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Wheat Allergy

Wheat is a grain used to make a wide variety of foods. A wheat allergy is one of the most common food allergies in children, but may affect adults as well. People with wheat allergies have IgE (allergic antibody) responses to proteins—albumin, globulin, and gluten—in wheat. Most allergic reactions involve albumin. Those with a wheat allergy usually outgrow it, but those with celiac disease do not lose their sensitivity to gluten. Therefore, those who suffer from celiac disease require a life-long restriction from wheat and other grains containing gluten such as rye, oats, and barley. A food labeled “wheat-free” that still contains gluten ingredients would be safe for someone with a wheat allergy to consume, but not for someone with celiac disease. Corn and rice contain some gluten, but in these forms, it does not appear to affect people with celiac disease. Although oatmeal does not naturally contain gluten, oats may be contaminated with it during growing and processing.

The U.S. Food and Drug Administration does not require manufacturers to disclose gluten on food labels (only wheat), so determining if any given product contains gluten takes some detective work unless that product is specifically labeled “gluten free.”

Non-Celiac Gluten Sensitivity

Non-Celiac gluten sensitivity (NCGS) applies to those individuals who cannot tolerate gluten and experience symptoms similar to those of Celiac disease. However, NCGS patients lack the same antibodies and intestinal damage as those with Celiac disease. NCGS not only has GI symptoms, but also includes non-GI symptoms such as headaches, “foggy mind,” joint pain, and numbness. In general, the symptoms of Non-Celiac gluten sensitivity are not as severe as Celiac disease. In some cases, patients can eat gluten in moderation. NCGS is caused by a completely different immune response to gluten than that of Celiac disease. NCGS is not an autoimmune disease and does not relate to reactive antibodies or the HLA-DQ2 or HLA-DQ8 genes. While there may be other genes involved in NCGS, more research is necessary to identify a specific genetic link.

Irritable bowel syndrome (IBS) affects up to fifteen percent of the population. People with IBS may have urgent diarrhea, constipation, a combination of both, or have gas and bloating. The etiologies of IBS are not completely clear; however, IBS is frequently associated with fibromyalgia syndrome. A subset of people who have IBS, but do not have Celiac disease, suffer from NCGS and see their IBS symptoms improve or even resolve completely when they eat a gluten-free diet.

Eosinophilic Esophagitis

Eosinophils, a type of white blood cells, are an important part of the immune system. A high number of eosinophils in the blood are commonly seen in eosinophilic esophagitis (EoE) and varying other conditions, such as parasite infection, food allergy, and drug allergy, to name but a few. The esophagus is the tube that sends food from the mouth to the stomach. While normally there are no eosinophils in the esophagus, with EoE, large numbers of eosinophils are found in the inflamed tissue.

EoE is an allergic and inflammatory disease. It affects 1 to 4 of every 10,000 people in the United States, and may occur in certain families. An estimated fifty percent of patients with EoE also have seasonal allergies, asthma, eczema, or even food allergies. Environmental allergies to allergens such as dust mites, animals, pollen, and molds may also play a role in some patients with EoE. Therefore, both genetic and environmental factors play a significant role in the development of the disease.

EoE can occur at any age and most commonly occurs in Caucasian males. The symptoms of EoE vary with age. Infants and toddlers may refuse food or fail to grow properly. Other younger children often have recurring abdominal pain, trouble swallowing, or vomiting. Older children and adults most often have difficulty swallowing or suffer food stuck in the esophagus.

Proper diagnosis of EoE needs to be confirmed by both an allergist and a gastroenterologist, each of whom will take a clinical history. Additionally, skin tests to food or even inhalant allergens will be ordered as will an upper endoscopy with biopsy to examine for eosinophils and inflammation of the esophagus. Gastrointestinal reflux or other inflammatory conditions need to be excluded as well.

The relationship between a food allergy and EoE is very complicated. In some patients, a allergy-triggering food can cause conventional immediate IgE-mediated reactions or non-IgE-mediated delayed reactions. Delayed reaction allergies to these foods often cannot be easily proven by conventional allergy tests (skin tests or blood tests). Occasionally, food patch testing, done in a research center, is used to determine if the patient has delayed reactions to a food. Eliminating major food allergens from one's diet including dairy, egg, wheat, peanuts, tree nuts, and fish have been shown to be very helpful in treating EoE. Amino acid based formulas and dietary elimination are also very effective therapies for children with EoE. Consultation with a registered dietitian is necessary to insure adequacy of calories, protein, and micronutrients.

Glucocorticosteroids, which can reduce eosinophils and inflammation, are the most helpful medications for treating EoE. Proton pump inhibitors, which decrease stomach acid,

may also be effective. When indicated, dilation of stricture in the esophagus provides relief of dysphagia.

Oral Allergy Syndrome

Pollens travel in the air or are carried by insects. Tree, grass, and weed pollen account for almost of all pollen-induced allergic rhinitis, conjunctivitis, and asthma. In the United States, most wind-pollinating plants release pollen during one of the five pollen seasons: early spring, late spring, early summer, late summer to autumn, and winter. Here in Florida, if your symptoms worsen during early spring, the probable cause is tree pollen whereas in the late spring and early summer, tree and grass pollen would be likely culprits. If your symptoms worsen from late summer to autumn, the probable cause is weed pollen, especial ragweed.

Oral Allergic Syndrome (OAS), also called pollen-food allergy, is an allergic reaction to fruits (usually fresh) and vegetables. Diagnosis of OAS is based on a clinical history and in some cases, conducting a skin test and even an oral food challenge with raw fruit or vegetables. OAS typically develops in adult hat fever sufferers. In adults, up to sixty percent of all food-induced allergic reactions are due to cross-reactions between foods and inhalant allergens. Often well-cooked, canned, or pasteurized food offenders cause little to no reactions due to the breakdown of the cross-reacting proteins.

Christine, a fifteen year-old student, used to have problems with sneezing and a runny, stuffy nose, mostly in the spring and fall. Last week, after eating watermelon, she immediately developed an itchy tongue and throat as well as swelling lips.

Christine inherited the ability to produce the IgE antibody to tree pollen which bound themselves to the surface of mast cells and basophil cells in the lining of her eyes, nose, airways, and even her oral cavity. After exposure to tree pollen, the mast cells and basophil cells will immediately release a variety of chemical mediators which induce allergic symptoms: itchy and watery eyes, a runny and stuffy nose, and even wheezing and difficulty breathing.

Christine also developed OAS, due to an allergic reaction to the watermelon protein. Because the protein of tree pollen is structurally similar to that of the watermelon, IgE antibodies could bind both the pollen proteins and the structurally similar watermelon proteins in a cross reaction. Consequently, she developed allergy symptoms in two different situations: hay fever (in the presence of tree pollen) and a food allergy (in the presence of watermelon).

Most patients develop oral symptoms within five minutes and almost all patients within 30 minutes after contact with the food. People with a tree pollen allergy may react to apples, almonds, carrots, celery, cherries, hazelnuts, kiwis, peaches, pears, and plums. People with a grass allergy may react to peaches, celery, tomatoes, melons, and oranges. People aller-

gic to ragweed react frequently to bananas, watermelons, cantaloupes, honeydew, zucchini, and cucumber. This does not mean that a patient will experience adverse effects from all of these foods. Reactions may begin with one type of food and reactions to others could develop later.

Red Meat Allergy

While ninety percent of food allergies are from peanuts, tree nuts, fish, shellfish, wheat, soy, milk, and eggs, a meat allergy can occur although extremely rare. Since 2008, over 1,500 cases of meat allergies linked to tick bites have been reported.

The link between a meat allergy and a tick bite is both unexpected and fascinating. A tick-triggered mammalian meat allergy may have gone unnoticed for years due to its unusual presentation of a delayed reaction. A meat allergy occurs in some people developing anti-alpha-gal antibodies after a tick bite, especially that of the Lone Star tick.

Three to six hours after consuming the mammalian meat, the anti-alpha-gal IgE antibodies in the victim's blood react to alpha-gal in the mammalian meat (beef, lamb, pork, or horse) and then trigger chemical mediators to release which cause the unusual delayed allergic reaction. This delayed reaction occurs because alpha-gal is most concentrated in animal fat, which takes several hours to digest. Alpha-gal's reactions vary from case-to-case with some patients experiencing a severe reaction while others none at all. The only mammals that do not have alpha-gal are humans, old world monkeys, and great apes. Chicken, turkey, and fish are not mammals and, therefore, do not have alpha-gal either.

In a majority of cases, tick bites have become a concern for meat-loving hikers, farmers, and nearly anyone who regularly spends time outdoors in the Southeastern states like Virginia, Kentucky, and Tennessee where the Lone Star tick is commonly found. The distribution and abundance of the Lone Star tick has increased steadily in the past twenty to thirty years, probably due to the concurrent rising of the population of its natural hosts, white-tailed deer and wild turkey. Moreover, there are more new cases recently found outside of the Lone Star tick area. Therefore, Lone Stars may not be the only tick anti-alpha-gal antibody carrier. Another type of tick, Ixodes holocyclus, has been reported to be an anti-alpha-gal antibody carrier in other countries, such as Australia, Spain, France, and Sweden.

Currently, there is a commercial test for measuring anti-alpha-gal IgE. In the meantime, people with a history of meat allergies and tick bites should avoid eating mammalian meat. Patients with a history of tick-triggered meat allergies should keep an Epi-pen available. The good news is that the allergic reaction seems to fade after a few years in some sufferers, providing they avoid additional tick bites.

Food & Additive Intolerance

Adverse reactions to foods are either immune-mediated or non-immune-mediated, depending on whether the immune system is primarily involved in the cause of the reaction. A common food allergy is an immune-mediated reaction to eggs, milk, soy, peanuts, tree nuts, shellfish, or fish. Reactions to foods that are not immune system responses are generally considered food intolerance. Types of food intolerance include toxin-induced (poisons), metabolic, pharmacologic, or other undefined reactions. Almost all reactions to food additives are food intolerance and are chemical, not allergic, reactions.

There are thousands of substances added to various foods for the purpose of coloring, flavoring, and preserving. Of the thousands of additives used, only a handful have been identified as possible causes of adverse reactions and it has been estimated that the percentage of those affected is less than one percent of adults and up to two percent of children. Food additives include the following: food dyes and coloring such as tartrazine, annatto, saffron, and carmine; emulsifiers and stabilizers such as gums and lecithin; flavorings and taste enhancers such as MSG, spices, and sweeteners (aspartame); preservatives such as benzoates, nitrates, sulfites, and sorbates; and synthetic antioxidants such as BHA.

Symptoms of Food Additive Intolerance

Symptoms of food intolerance to additives vary by type and degree. They depend on what kind of additive, the sensitivity of the patient, and the quantity consumed. People who react to one chemical are not likely to react to others. Many reactions to food additives are mild and resolve without treatment. More severe reactions including urticaria, angioedema, worsening asthma, and anaphylaxis, may require immediate medical attention.

"Diagnosing" Food Additive Intolerance & the Solution

A reaction to food additives is suspected when a person experiences negative responses to unrelated foods with common ingredients such as additives or while eating at restaurants, but not from foods prepared at home. Most food additives cause a reaction that lasts less than one day. If you suspect food additives may be the source of the problems, remove the additive from your diet for a few days. Your symptoms should resolve promptly if the additive is the cause. There are no allergy tests specifically for food additive intolerance. In many instances, the only way to truly diagnose an adverse reaction to food additives is for a person (under the close supervision of an allergist) to undergo an oral challenge with the suspected additive.

Most food additives are listed on the product label, along with other ingredients, in a descending order by weight (flavors are an exception and do not need to be identified). Occasionally, the additive is represented by a code number, so read labels carefully. Buy organic food products whenever you can. Though more expensive than regular products, organically-produced food carries a much lower risk of containing food additives and dyes.

