

THE VALIDATION OF LEAKY GUT AND ITS ASSOCIATION WITH CHRONIC HEALTH CONDITIONS

If you read the New York Times article, “Who Has the Guts For Gluten?” (Feb 23, 2013) you learned that celiac disease is an autoimmune condition that affects genetically vulnerable people who eat gluten containing foods. Gluten is one of the proteins found in wheat, rye, kamut, spelt, and barley and exposure occurs when eating these grains or any foods made with these grains. Three major points were made in the article. First, the prevalence of the condition in the US is increasing rapidly – quadrupling in the last 50 years. Second, manifestations of the condition range from having no obvious signs and symptoms to having lymphoma. There can be abdominal symptoms (diarrhea, abdominal pain, bloating...) as well as body-wide effects (anemia, osteoporosis, joint pain, rashes...). Third, specific genes and exposure to gluten don't always produce the condition. Some other factors need to be present and researchers believe it may be the company you keep – in your gut. Unfriendly bacteria in the intestines may be a trigger that is required for celiac disease to develop.

Another recent study on colon cancer risk also found intestinal bacteria playing a role. These researchers found that a common bacteria that normally lives in our intestines without causing a fuss can become very aggressive in the context of inflammation. When the intestinal environment is irritated and inflamed, these bacteria are able to stick to the intestinal cell walls and this “invasion” is able to promote cancer growth in the colon.

In functional medicine we have always believed that one's state of health is multifactorial. Optimum health requires attention to and balance in factors that support our physical, emotional, mental and spiritual domains. Poor health is a perfect storm of imbalances in these same areas. There may be a lot of interesting research teasing out the novel factors that affect our health yet Grandmothers wisdom - a whole foods diet with adequate protein and fats, plenty of fruits, vegetables and water, adequate sleep and exercise, exposure to nature, good company and support, work that you love and a belief system that affirms you – seems to either include or have a positive effect on whatever new risk factors are found. Each of us, though, being unique, requires a different balance of factors based on our specific genes, conditions and lifestyle.

Back to the gut though. The gut lining is the interface between the outside world (food, toxins) and our bodies. This wall of the small intestine, where food is absorbed into the blood, is only one cell layer thick. Each cell is tightly bound to the cell alongside it, such that it creates a barrier separating the intestinal contents from the blood and lymph vessels. On the inside wall (facing the food slop) exists a dynamic interplay between the cells, the trillions of bacteria that live there, and the cells of the immune system that hang out there – all designed to keep you safe from bad bugs, bad food, parasites, viruses, and toxins. When there is a break in that defensive line, it is called “leaky gut” or intestinal permeability and that condition is a set up for body wide inflammation. Leaky gut has been associated with autoimmune conditions, cancer, allergies, depression, diabetes, and probably any inflammatory condition.

We now have a marker for leaky gut called zonulin. Fasano, the famous celiac researcher, has found that irritants or allergens travelling through the intestines can bind to a receptor on the small intestinal cell wall causing the cell to release zonulin. Zonulin causes the tight junctions between the cells to break apart. Gaps appear between the cells allowing the toxin to leak

through and to be seen by the second line of defense – the big boys of the systemic immune system. All hell breaks loose then – signals are sent far and wide to bring in more troops, keep the soldiers on high alert – the immune system is all fired up and this is called inflammation. It is an appropriate response for a short term exposure but not OK for day to day functioning.

How do we avoid the dreaded “leaky gut” syndrome? Considering the current epidemic of inflammatory conditions and the 21st century lifestyle (not your grandmother’s lifestyle!), I would say most people already have some degree of leaky gut. Frankenfoods (made with new-to-nature molecules found in GMOs, food additives, and processed foods) and certain drugs and toxins can irritate the intestinal cells. Food allergens and shifts in the intestinal bacterial milieu (from antibiotics, dietary choices...) also can elicit a zonulin response.

Other cells of the immune system called mast cells release a chemical called histamine in response to injury or when encountering a foreign substance. Histamine release causes a local inflammatory reaction and membranes leak their fluids (as in the runny nose and watery eyes of seasonal allergies). Once it starts, the body has a way of decreasing the histamine reaction to keep the balance. It releases histamine diamine oxidase, the enzyme that breaks down histamine into a harmless product. Some people have a deficiency of diamine oxidase and they may have more severe symptoms from the longer lasting histamine and its consequences.

Diamine oxidase is found in many places in the body including the intestines. There, it sits on the top of the intestinal cells – watching and waiting for a bunch of histamine to take down. If diamine oxidase is low, exposure to an irritant in the intestines produces an unimpeded histamine reaction which can cause headaches, stomach aches, flatulence, and diarrhea. Persistently high amounts of histamine in the intestines can cause leaky gut and systemic inflammation and has been associated with many conditions such as Crohn’s disease, Ulcerative Colitis, allergies, food allergy, and colorectal cancer. Diamine oxidase is valuable stuff and unfortunately there are people who don’t have enough. They include people with genetic variations in their histamine or diamine oxidase genes, and taking drugs that deplete diamine oxidase. Since the enzyme lives on the front lines of the battles, leaky gut conditions themselves deplete diamine oxidase and this is a feed forward cycle of inflammation. Higher levels of histamine are seen in people who eat a lot of histamine containing foods and/or are exposed to allergens that cause more histamine release. In these scenarios, those people without enough diamine oxidase are really flooded with histamine and probably suffer with symptoms and conditions never knowing how they have created a perfect storm of inflammation. Once irritants from food, bacteria, viruses and toxins gain access to the body-wide circulation, symptoms and conditions can arise in tissues and organs not related to the gut. Yet cleaning up the gut would be the solution to alleviating these conditions. In functional medicine we have tools to help you identify and control your exposures, maintain immune tolerance and control inflammation and immune activation. Even those of us who are following our grandmother’s advice can find ourselves with an inflammatory condition. I believe it is due to the pervasiveness of environmental triggers to our health which have become so much more complex in just two generations time.

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Side Bar

Preventing or Controlling Inflammatory Conditions

Symptoms of inflammatory conditions are preceded by elevations of zonulin many years in advance. Testing those at risk of autoimmune conditions, cancer, allergies, etc...(all of us?) gives time to repair the intestinal milieu and lower future risk

Evaluations done at our office include:

Newer and more precise testing for food allergies

Testing for gut function

Blood testing for histamine, diamine oxidase and zonulin

Predictive antibody testing enabling detection of predispositions and triggers

Treatments can include:

Food allergy elimination and rotation plans

Whole foods balanced and targeted eating plans

Enzyme replacement

High potency, well researched strains of probiotics

Products that heal the gut lining and enhance immune tolerance