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Is a Gluten-Free Diet Healthy for People Without Celiac Disease?

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These days, many supermarkets have dedicated gluten-free aisles that help shoppers easily find gluten-free products as grocery stores and food distributors nationwide are responding to the exploding demand for gluten-free products. In 2013, U.S. sales of products with a gluten-free label reached $23.3 billion. The gluten-free products market is projected to grow 10.2 percent from 2014 to 2019. That is good news for people with celiac disease, but interestingly, most people who purchase gluten-free products do not have celiac disease or a gluten sensitivity. About one-third of Americans report trying to avoid gluten (Jargon 2014). They simply perceive that a gluten-free diet is healthier. In fact, a gluten-free diet can lack vitamins, minerals, and fiber, and following this diet for no reason might not be a wise choice.

What Is Gluten?

Gluten is a protein found in some grains including wheat, barley, rye, bulgur, farro, kamut, spelt, oats, and triticale (a hybrid of wheat and rye). These grains and products contain 5-12 percent (by weight) of gluten. For example, a slice of wheat bread (approximately 30 grams) contains 1.5 grams of gluten. The average gluten-containing diet can be calculated at 10-40 grams of gluten per day. Gluten provides viscosity (thickness) and elasticity (stretchiness) that helps foods maintain their shape. Gluten itself has low nutritional and biological value, but gluten-containing foods provide important nutritional components. Gluten is one of the most common proteins that cause food allergies and allergens in the U.S.

Celiac Disease and Gluten Sensitivity

Celiac disease is an autoimmune disorder that can occur in genetically predisposed individuals where consumption of gluten leads to damage in the small intestine. It is estimated that 1 in 100 people worldwide is affected by celiac disease. The ratio in the U.S. is the same: About 1 percent of Americans (2.5 million) are diagnosed with celiac disease. Since celiac disease often has few or no symptoms, only about 5 to 10 percent of cases in the U.S. are diagnosed (NIDDK 2015). When people with celiac disease eat food that contains gluten, their body triggers an immune response that attacks the small intestine, which leads to villi damage. Villi are small fingerlike projections lining the small intestine that help with nutrient absorption. When the villi get damaged, nutrients cannot be absorbed properly into the body. Celiac disease affects people differently, and there are numerous symptoms that can occur in the digestive system or other parts of the body, including diarrhea, weight loss, anemia, bone pain, and dermatitis herpetiformis (a severe skin rash). Left untreated, celiac disease can lead to additional serious health problems, including Type 1 diabetes, multiple sclerosis, osteoporosis, infertility and miscarriage, neurological conditions like epilepsy and migraines, short stature, and intestinal cancers. A blood test that detects antibodies related to an abnormal immune response is used to help diagnose celiac disease. If the blood test is positive, a biopsy is performed to confirm inflammation in the lining of the small intestines (MedlinePlus 2016).

Gluten sensitivity is different from celiac disease in that it is not an immune-mediated response. Gluten sensitivity is characterized by a heightened immunologic reaction to gluten in genetically susceptible individuals. Another 18 million Americans have gluten sensitivity and experience discomfort without intestinal damage (Sapone et al. 2012). Symptoms are similar to those of celiac disease and include abdominal cramping, bloating, diarrhea, and flatulence. People with gluten sensitivity may feel better with less gluten intake (Biesiekierski et al. 2014).

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Gluten-Free Diet

To date, the gluten-free diet is the only effective treatment for people with celiac disease. Grains containing gluten are widespread in the American diet, including breads, noodles, crackers, breakfast cereals, conventional pastas, pastry goods, a wide range of processed foods (ADA 2014), and medicinal products (as a binder in pills or tablets; Lamacchia et al. 2014). Therefore, completely eliminating gluten is challenging.

Studies show that whole-grain foods as part of a healthy diet can help lower the risk of heart disease, Type 2 diabetes, and certain types of cancer. The 2015 Dietary Guidelines for Americans (HHS 2015) recommends that half of all carbohydrates in the diet come from whole-grain products. Good gluten-free grain sources are rice, sweet rice, brown rice, amaranth, millet, guar gum, potato starch, buckwheat, corn flour, tapioca starch, lentils, soy flour, and quinoa. However, these are far less common than gluten-containing sources in the American diet, and not all are whole-grain. Therefore, meeting the 2015 dietary guidelines goal while eating a gluten-free diet can be very difficult. The following link to the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK 2015) provided examples of gluten-free food: www.niddk.nih.gov/health-information/health-topics/digestive-diseases/celiac-disease/Pages/facts.aspx. People with celiac disease should read food ingredient lists to make sure the food is gluten-free and discuss gluten-free food choices with a dietitian or health care professional who specializes in celiac disease.

U.S. Food and Drug Administration Rules for Gluten-Free

The FDA (2015) defined the term "gluten-free" as food that is either inherently gluten-free or does not contain an ingredient that is (1) a gluten-containing grain (e.g., spelt wheat), (2) derived from a gluten-containing grain that has not been processed to remove gluten (e.g., wheat flour), or (3) derived from a gluten-containing grain that has been processed to remove gluten (e.g., wheat starch). The gluten-free label on packaged foods took effect on Aug. 5, 2014, and FDA regulations are intended to help Americans with celiac disease. This standard definition will eliminate uncertainty about how food producers label their products and will assure people with celiac disease that foods labeled gluten-free meet a clear standard established and enforced by the FDA. A packaged food labeled gluten-free (or free of gluten) cannot contain more than 20 parts per million of gluten. This rule applies to packaged foods for now; however, the FDA will work with state and local governments in oversight of restaurant menus.

Risks and Problems Related to a Gluten-Free Diet

- Most whole grains are rich sources of vitamins and minerals, including B vitamins, zinc, and magnesium, as well as fiber (Shepherd and Gibson 2013; Wierdsma et al. 2013; Caruso et al. 2013; Murray 1999; See et al. 2015). Therefore, gluten-free diet treatments could increase the risk of nutritional deficiencies. Adding gluten-free foods containing these nutrients or using supplements can make up for any nutritional shortfalls that occur as a side effect of the gluten-free diet.

- Not all gluten-free foods on the market are healthy. Some gluten-free products are high in saturated fat, cholesterol, sodium, or sugar. Others are high in calories, and many are not whole-grain. Gluten-free does not mean the foods are healthier than their gluten-containing counterparts.

- Gluten can be introduced into gluten-free products if they are processed on a production line that could cross-contaminate them. Recently, General Mills (2015) recalled certain boxes of Cheerios labeled "gluten-free" because wheat was present in some product.

- Herbal remedies have been introduced to the market with the promise to ease gluten sensitivity; however, there is little evidence that they help.

- Most gluten-free alternatives are more expensive than their gluten-containing counterparts (MacCulloch and Rashid 2014; Lee et al. 2012; Singh and Whelan 2011). Gluten-free products can be lacking in variety or might not be as accessible as gluten-containing products in some grocery stores.

- Gluten can be found in nonfood sources such as cosmetics, lotions, shampoos, and medications.

- A gluten-free diet can affect lifestyle and social functioning, such as having to eat more meals at home (Silvester et al. 2015).

Effects of a Gluten-Free Diet on Nonceliac Health Conditions: Recent Research Findings

Neurologic Disorders

A possible association of celiac disease with neurologic disorders such as ADHD, ADD, autism spectrum disorders, multiple sclerosis, migraine headaches, epileptic disorders, and motor abnormalities has been reported repeatedly (Bushara 2005; Zelnik et al. 2004; Lahat et al. 2000), but scientific research on this topic is very limited. Currently, research evidence is insufficient to support a gluten-free diet as a treatment for the listed conditions.

Attention-Deficit Hyperactivity Disorder

A study tested 67 subjects aged 7 to 42 years with ADHD and found that a gluten-free diet improved ADHD symptoms in patients with celiac disease (Niederhofer 2011). There is very limited research on a gluten-free diet in people with ADHD who do not have celiac disease.

Autism Spectrum Disorders

Autism spectrum disorders represent a diverse array of conditions impacting social and communication functions. A recent review investigated the effectiveness and safety of the gluten-free diet in autism spectrum disorders and concluded that the evidence to support the gluten-free diet is limited and weak (Mari-Bauset et al. 2014). A recent survey in the U.K. found a weak and limited effect of a gluten-free diet and concluded that a gluten-free diet should be administered if celiac disease or gluten sensitivity is diagnosed (Lange, Hauser, and Reissmann 2015).

Multiple Sclerosis

Multiple sclerosis is an inflammatory autoimmune disorder in which the immune system attacks the protective sheath (myelin) that covers nerves. Some MS cases are gluten-related conditions that are a spectrum of systemic immune dysfunction. Historically, a gluten-free diet was occasionally used in the management of MS (Matheson 1974). However, the benefit from this diet was not consistent (Liversedge 1977; Franklin and Nelson 2003). In a study, patients with gluten-related MS might benefit from a gluten-free diet (Hernandez-Lahoz and Rodrigo 2013). Another study found an association between antibodies against gluten and MS, but the role of these antibodies in the pathogenesis of MS is uncertain (Shor et al. 2009). Patients should work with their health care providers to determine if a gluten-free diet is effective and warranted for their specific case.

Irritable Bowel Syndrome

IBS is a chronic condition that affects the large intestine and causes cramping, abdominal pain, bloating, gas, diarrhea, and constipation. These symptoms display significant overlap with nonceliac gluten sensitivity. A recent study showed that other components in grain are triggering these conditions, and it also found that IBS was triggered by gluten in only a small percentage of participants with IBS (Nijeboer et al. 2013). Another study with nonceliac IBS patients found that a gluten-free diet slightly improved IBS-related symptoms (chronic abdominal pain, changes in intestinal habit, bloating) in patients with intestinal inflammation but not in patients with a normal intestine (Volta 2014).

Performance in Nonceliac Athletes

Recently, use of gluten-free diets among nonceliac athletes has rapidly increased due to its perceived performance enhancing benefits. Only one study so far has examined the effect of a gluten-free diet on exercise performance. A small study (13 subjects) showed no effect of a gluten-free diet on performance (Lis et al. 2015).

Conclusion

Anyone experiencing symptoms associated with celiac disease should pursue medical testing.

- If the diagnosis is celiac disease, the symptoms could be alleviated by eliminating gluten. Fortunately, the growing awareness of the prevalence of this condition should continue to make that challenge easier. Clinical trials of drugs that might help ease celiac disease are currently underway. A vaccine for celiac disease is also under investigation.
- If the diagnosis is gluten sensitivity without celiac disease, it is worthwhile to reduce gluten intake to determine if symptoms decrease.

- The basis of a gluten-free diet, as with any diet, should be healthy. Despite the restriction, people with celiac disease can eat a well-balanced diet with a variety of foods.

- Grains that contain gluten include wheat, barley, rye, bulgur, farro, kamut, spelt, oats, and triticale.

- Gluten-free grains include rice, sweet rice, amaranth, millet, and quinoa. More products are being made with these grains, such as breads, breakfast cereals, and pastas. It has become easier for people with celiac disease to find gluten-free products due to the growing selection of these foods. Whole grains should still be emphasized.

If people without celiac disease want to try a gluten-free diet, they should remember:

- Gluten-free diets can lead to nutrient deficiencies (such as the vitamins, minerals, and fiber contained in whole grains).

- "Gluten-free" does not mean the products are healthier than their gluten-containing counterparts.

- It is necessary to eat a balanced diet to get enough nutrients.

Remember, just because a product is gluten-free does not mean that it is healthy. Many people are trying the gluten-free diet for no medical reason.

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