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Barley: A Reason to Think Twice Before Choosing a Gluten-Free Diet

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- Eliminating gluten is generally not recommended as there are no established health benefits for people without celiac disease or non-celiac gluten sensitivity.
- A gluten-free diet should not be self-prescribed without medical supervision. It is restrictive, difficult to follow and can result in inadequate nutrient intake.
- Whole grains such as barley have numerous health benefits and are encouraged for most people.

Dietary fibre intake is inversely associated with risk of chronic disease, including coronary heart disease, stroke, hypertension, diabetes, obesity and metabolic syndrome[1]. Barley has the highest fibre content and lowest glycemic index of the cereal grains. It is one of the richest sources of the soluble fibre β-glucan. Due to substantial evidence that this fibre lowers blood cholesterol, both Canada and the United States have approved cardiovascular health claims for food products containing barley β-glucan.

A recent fad in some diet plans is to demonize specific foods or food components as the cause of overweight and illness. Such an approach ignores multi-factorial lifestyle and dietary choices[2]. Recently, gluten has been a target for dietary exclusion. As a grain containing gluten, barley is not permitted in a gluten-free diet. Is there reason to switch to a gluten-free diet in spite of the well-established health benefits of high-fibre, whole grains such as barley? Only for those medically prescribed to avoid gluten.

Celiac Disease, Non-Celiac Gluten Sensitivity and Wheat Allergy

The gluten-free diet was developed to treat patients with celiac disease (CD) or non-celiac gluten sensitivity (NCGS)[3]. CD is an inherited chronic, inflammatory, immune-mediated disorder induced by dietary gluten in genetically susceptible individuals. CD results in damage to the intestinal villi[4]. The clinical symptoms of CD vary considerably, but often include diarrhea, weight loss and abdominal pain[5]. Some CD patients are asymptomatic but still need to follow a gluten-free diet to prevent future complications such as malnutrition, osteoporosis, infertility and gastrointestinal malignancies[5]. The prevalence of CD in Canada and the United States is estimated to be 1:133[5,6] .

NCGS is a syndrome evoked by gluten ingestion in patients in whom CD and wheat allergy have been excluded[7]. Unlike celiac disease, NCGS is not an autoimmune disorder, nor does it cause damage to the small intestine. Other food components that may also trigger NCGS include grain proteins other than gluten as well as fermentable oligosaccharides, disaccharides, monosaccharides and polyols[7,8].

Currently, no pharmacological therapy is available for CD or NCGS. The only scientifically proven treatment is a complete, lifelong avoidance of foods containing gluten[9]. Gluten is a storage protein found in wheat (including spelt and kamut), barley and rye, and is the composite of the proteins gliadin and glutenin[5]. Oats do not contain gluten, but are often cross-contaminated with gluten from other grains[4]. Due to the ubiquitous presence of gluten-containing ingredients in the food supply, many patients have difficulty following a strict gluten-free dietary regime, which results in persistent symptoms, inadequate cure and/or refractory disease[5].

The diagnostic gold standard for CD is biopsy of the small intestine, though serum tests are available to first assess whether a biopsy should be performed[3]. It is important to be tested for CD before starting a gluten-free diet because eliminating gluten may affect the results of the serologic analysis and intestinal biopsy used for diagnosis[9]. Currently, the only way to definitively diagnose NCGS is using a double-blind placebo-controlled food challenge[8].

Wheat allergy is an adverse immunologic reaction that occurs in approximately 0.3 to 3.0 per cent of the population[2]. It is not the same as gluten sensitivity[2]. People who are allergic to wheat may be able to tolerate other cereal grains such as barley. Although barley may be eliminated from the diet when first implementing a wheat-free diet, the health benefits of barley warrant experimentation with reintroduction under medical supervision.

Health Effects of Gluten-Free Diets

Up to 30 per cent of U.S. adults are reducing or eliminating gluten from their diets for various reasons[10]. Retail sales of gluten-free products have increased by up to 28 per cent in the last 10 years[10]. There is a belief that humans are not meant to eat gluten since it was not part of the diets of our early ancestors. While it is true that gluten-containing crops have only been cultivated for a few thousand years, most people handle gluten without any problem[11]. For most people, a gluten-free diet is not necessary and there is little evidence that eliminating gluten promotes health in people who have not been diagnosed with CD or NCGS[12].

Many people choose to consume a gluten-free diet without medical supervision or dietary guidance from a registered dietitian[10]. Inadequate levels of fibre, iron and calcium intakes have been reported in a large proportion of individuals on a gluten-free diet[3,13]. Adherence to a gluten-free diet is restrictive, socially difficult to maintain and typically involves higher food costs. It should not be assumed, just because a food is gluten-free, that it is a healthy option.

Autism

Gluten-free diets are promoted in the media for people with autism. Gastrointestinal symptoms are often associated with autism, but the prevalence has not been shown to be greater than in the general population[3]. One belief is that people with autism have a "leaky gut" that allows gluten fragments to be absorbed into the bloodstream, affecting the brain and nervous system. Data on the association between gluten and autism is very limited. Some evidence suggests that a gluten-free diet may benefit a subset of individuals with autism, but the cost and difficulty in eliminating dietary gluten indicates a limited return on investment for the majority of patients[3].

Weight Control

There is limited research on the association between gluten and obesity. Soares et al [14] examined the effect of a gluten-free diet on body weight, inflammation and glucose homeostasis in a mouse model of obesity[14]. Animals receiving a gluten-free diet gained less body fat without changes in food intake or lipid excretion, and had improved glucose homeostasis and inflammatory profile. The authors concluded that a gluten-free diet reduces fat gain, inflammation and insulin resistance, and that gluten exclusion should be assessed as a new dietary approach to preventing obesity and metabolic disorders[14]. However, the validity of these conclusions has been questioned due to limitations in the study design.[2]

On the contrary, numerous studies suggest that fibre from whole grains supports weight management[15]. Soluble fibres, such as the β-glucan in barley, contribute to satiety by absorbing large amounts of water and forming gels, thereby increasing stomach distension and slowing gastric emptying[16]. In addition, whole grains protect against cardiovascular disease by improving blood glucose control, reducing blood pressure, and lowering cholesterol and high-sensitivity C-reactive protein levels[2].

Although the adverse effects of gluten for some individuals cannot be ignored, the consumption of whole grains such as barley has numerous positive effects on health and their intake should therefore be encouraged[2].

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