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Activity CG 10: Supplement handout

Selenium

Supplement Information for your Gluten-Free Patients

Selenium Deficiency and the Gluten-Free Diet

Individuals with celiac disease or who adhere to a gluten-free diet for other reasons are especially susceptible to nutritional deficiencies. Nutrients of concern for a patient following a gluten-free diet include vitamin D, B vitamins, calcium, iron, zinc, and fiber. Though selenium deficiency is uncommon in individuals consuming a typical Western diet[1], individuals who follow a gluten free diet are at elevated risk[2]. Wheat and its derivatives, such as flour or cereal, are often a source of selenium, so when these items are omitted in a gluten-free diet, selenium content is not always recouped[2]. Further, damage to the small intestines caused by celiac disease can hinder the absorption of selenium and other nutrients.

	Recommended Dietary Allowance (µg/day)	Tolerable Upper Limit (µg/day)
1-3 yrs	20	90
4-8 yrs	30	150
9-13 yrs	40	280
14-18 yrs	55	400
19-30 yrs	55	400
31-50 yrs	55	400
51-70 yrs	55	400
>70 yrs	55	400
Pregnancy		
14-18 yrs	60	400
19-30 yrs	60	400
31-50 yrs	60	400
Lactation		
14-18 yrs	70	400
19-30 yrs	70	400
31-50 yrs	70	400

Source: United States Department of Agriculture, Food and Nutrition Information Center

The Health Impact of Selenium Deficiency in Gluten-Intolerant Individuals

Selenium is incorporated into several proteins—known as selenoproteins—that play vital roles in the body, and a selenium deficiency can be especially deleterious for someone with celiac disease. Glutathione peroxidase, one of the body's most important antioxidants, is a selenoprotein[1-3]. Celiac disease is associated with an increased risk of several kinds of cancer[1]. Selenium adequacy is important to protect against cancer; in fact, individuals with low plasma selenium concentrations may experience a reduction in cancer incidence when given selenium supplements[1]. Selenoproteins are also involved in thyroid health, and patients with celiac disease are at increased risk for autoimmune thyroid disease[2]. Autoimmune thyroid diseases are the most common cause of hypothyroidism, and a hypo-active thyroid can mask the most common symptoms of celiac disease, such as weight loss and diarrhea[2]. Therefore, selenium deficiency can exacerbate thyroid damage in individuals with celiac disease.

Selenium supplements should <u>not</u> be taken in combination with[5]:

- **Anticoagulants—including aspirin—and blood thinners**
- **Niacin**
- **Sedatives**
- **Statins**

Selenium Deficiency and Gluten-Free Diets: Recommendations

Patients with celiac disease or who follow a gluten free diet for other reasons may benefit from supplementation due to a lack of nutrients in the diet and/or malabsorption. Individuals following a gluten-free diet should be cognizant of their nutrient status, and those with sub-optimal plasma selenium concentrations should consider selenium supplements. Studies have shown that selenium supplementation between 120-200 µg/day is within a safe range[1,2]. It is important, however, not to exceed the tolerable upper limit for selenium, as this can gastrointestinal upset, hair loss, nerve damage, and can even increase the risk of cancer[2,4]. Selenomethionine, the organic form of selenium, is more readily absorbed and more readily used by the body that inorganic forms of selenium.

Hidden Gluten

When most people think of gluten-free diets, they think of avoiding flour. But it is important to be aware that gluten can be found elsewhere, even in medications. Supplements and medication are usually made up of two kinds of ingredients: active and inactive. Inactive ingredients, or "excipients" act as fillers. It is not unusual for these excipients to be derived from gluten-containing grains. Clients who are gluten-free should be advised to thoroughly read ingredients, and when in doubt, contact the manufacturer pharmacist to verify that a supplement is gluten free. Supplements in liquid form may be less likely to contain gluten, and may facilitate absorption for someone with intestinal damage.

References
[1]Shils ME, Shike M, Ross AC, Caballero B, Cousins R. *Modern Nutrition in Health and* Disease. 10th edition. Baltimore, MD. Lippincott Williams & Wilkins; 2006.
[2]Stazi AV, Triniti B. *Selenium status and over-expression of interleukin-15 in celiac disease and autoimmune thyroid diseases.* Ann Ist Super Sanita. 2010;46(4):389-99. Review.
[3]Mahan LK, Escott-Stump S. *Krause's Food and Nutrition Therapy*. 12th ed. Philadelphia, PA. Saunders Elsevier, 2008.
[4]Office of Dietary Supplements, National Institutes of Health. http://ods.od.nih.gov/factsheets/selenium.
[5]MedlinePlus. *Selenium*. U.S. National Library of Medicine, National Institutes of Health. http://www.nlm.nih.gov/medlineplus/druginfo/natural/1003.html.