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File: ■ Green Tea (*Camellia sinensis*)
■ Obesity
■ Mineral Levels

HC 061211-456

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Re: Green Tea Supplementation Alters Mineral Status and Improves Lipid and Glucose Profiles in Obese Patients

Suliburska J, Bogdanski P, Szulinska M, Stepien M, Pupek-Musialik D, Jablecka A. Effects of green tea supplementation on elements, total antioxidants, lipids, and glucose values in the serum of obese patients. *Biol Trace Elem Res*. May 15, 2012; [epub ahead of print]. doi: 10.1007/s12011-012-9448.z.

Obesity is associated with many adverse health effects, including the development of many chronic diseases. Studies have shown abnormalities in mineral status, increased oxidative stress, and metabolic imbalances are associated with obesity. So-called "functional foods," such as green tea (*Camellia sinensis*; GT), are reported to reduce the risk of many health problems associated with obesity. The compounds in GT that are most likely responsible for these effects are polyphenolics, especially catechins such as epigallocatechin-3-gallate (EGCG). Although polyphenolics are reported to interact with minerals and alter their distribution throughout the body, few studies have explored the effects of GT on obesity and mineral status. Thus, the aim of this randomized, double-blind, placebo-controlled study was to assess the health effects of obese patients supplemented with GT extract (GTE) by analyzing serum mineral concentrations and obesity-related parameters, such as body mass index (BMI), blood pressure, total antioxidant status (TAS), lipid profiles, and glucose concentrations.

A total of 46 obese patients (23 men and 23 women) aged 30-60 years, with a BMI ≥30 kg/m^2, and without health conditions that would confound the study, were enrolled in the trial. All patients received one 379 mg GTE capsule (Olimp Laboratories; Dębica, Poland) per day, containing 208 mg EGCG, or placebo (cellulose) with their morning meal for 3 months. All subjects maintained an isocaloric diet (kept same calorie diet throughout the study) and continued previous eating and physical habits during the study. Anthropometric (body) measurements, blood pressure, and blood collection were taken at baseline and after 3 months of treatment. Biochemical studies were conducted on blood samples to measure mineral status and other obesity-related parameters.

There were no significant differences between the 2 groups at baseline. However, after 3 months of treatment with GTE, in comparison to the placebo, a significant reduction of

total cholesterol (TC) (P<0.01), triglycerides (TG) (P<0.01), low-density lipoprotein (LDL) cholesterol (P=0.02), BMI (P=0.03), and waist circumference (P=0.04) was observed, while a significant increase was observed in TAS (P<0.01) and zinc (P=0.03) levels. In comparison to baseline measurements, only the 3-month GTE group resulted in significant changes in the measured parameters. GTE treatment resulted in a significant reduction in TC (P=0.034), TG (P=0.042), LDL cholesterol (P=0.035), glucose (P=0.043), and iron (P=0.048) levels; and a significant increase in high-density lipoprotein (HDL) cholesterol (P=0.044), TAS (P=0.048), zinc (P=0.037), and magnesium (P=0.047) levels.

Moreover, before treatment a significant positive correlation was found between calcium and BMI (P=0.042) and a negative correlation was found between copper and TG (P=0.038). After treatment, a significant positive correlation was observed between iron and BMI (P=0.023) and between magnesium and HDL cholesterol (P=0.023), while a significant negative correlation was found between magnesium and glucose (P=0.002).

The authors conclude that supplementing obese patients with 3 months of GTE resulted in a change in serum mineral status, which included a significant improvement of zinc and magnesium content, but reduced iron levels. Furthermore, the authors summarize that treatment with GTE produced favorable effects on BMI, lipid profile, glucose, and TAS. Although the health implications of this study are for the most part positive, the reduction of serum iron may be of concern. Many of the polyphenolics in GT can function as iron chelators, which may prevent absorption of iron and possibly compound the effects of low serum iron that may result from obesity-related inflammation.[1] Thus, more studies are needed that assess the safety levels of GT polyphenolics in obese patients. Additionally, the authors suggest larger-scale studies with longer observation times are needed to support the data in this study.

—Laura M. Bystrom, PhD

Reference

[1]Tussing-Humphreys LM, Liang H, Nemeth E, Freels S, Braunschweig CA. Excess adiposity, inflammation, and iron-deficiency in female adolescents. *J Am Diet Assoc*. 2009:109(2):297-302.

Referenced article can be found at http://www.springerlink.com/content/01p94v30j28h74u3/fulltext.pdf.