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File: ■ German Chamomile (*Matricaria recutita* syn. *M. chamomilla*, Asteraceae)
■ Glycemic Indices
■ Antioxidant Status
■ Type 2 Diabetes Mellitus

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RE: German Chamomile Tea Improves Glycemic Control and Antioxidant Status in Patients with Type 2 Diabetes Mellitus

Zemestani M, Rafraf M, Asghari-Jafarabadi M. Chamomile tea improves glycemic indices and antioxidants status in patients with type 2 diabetes mellitus. *Nutrition*. January 2016;32(1):66-72.

Chronic hyperglycemia in patients with type 2 diabetes mellitus (T2DM) can cause complications such as heart disease, retinopathy, renal disease, and neuropathy. Oxidative stress plays a major role in the development of such complications. Because the available therapeutic options, such as oral hypoglycemic drugs and insulin therapy, have some limitations, traditional plant medicines have been used as alternative or complementary therapies. In experimental studies, German chamomile (*Matricaria recutita* syn. *M. chamomilla*, Asteraceae) extracts have demonstrated antihyperglycemic and antioxidant activity. These authors conducted a single-blind, randomized, controlled, clinical trial to evaluate the effects of chamomile tea on glycemic control and antioxidant status in patients with T2DM.

The authors recruited 64 patients aged 30 to 60 years with a body mass index (BMI) lower than 37 kg/m^2 from the endocrinology clinic at Imam Hossein Hospital in Tehran, Iran, from March 2013 to June 2013. The patients had been diagnosed with T2DM at least 6 months before the study. A general questionnaire was completed for each patient. At baseline and after 8 weeks, body weight and height were recorded, and daily energy and macronutrient intakes for a 3-day period were calculated.

The authors obtained homogenous chamomile tea bags from the Iranian Institute of Medicinal Plants in Karaj, Iran. Each tea bag, containing 3 g of chamomile tea, was manufactured in March 2013.

For 8 weeks, 32 patients in the chamomile group consumed 1 cup of chamomile tea infusate (1 tea bag infused for 10 minutes in 150 mL hot water) 3 times daily immediately after meals. The control group (n=32) consumed an equivalent amount of warm water for 8 weeks. Patients were asked to keep a record of all beverages consumed during the trial, maintain their usual dietary intake and physical activity, and avoid any changes in medications if

possible. All patients completed the study. More than 97% of the tea bags were consumed, without any reported adverse effects.

Venous blood samples were drawn from each patient after an overnight fast at the beginning of the trial to assess glycemic control (serum levels of glucose, glycosylated hemoglobin [HbA1c], insulin, and homeostasis model assessment-insulin resistance [HOMA-IR]) and antioxidant status (total antioxidant capacity [TAC]; activity of the antioxidant enzymes superoxide dismutase [SOD], glutathione peroxidase [GSH-Px], and catalase [CAT]; and the oxidative stress biomarker malondialdehyde [MDA]).

At baseline and after 8 weeks, no significant between-group differences were seen in weight, BMI, or total energy and nutrient intakes. Baseline levels of glucose, insulin, and HOMA-IR were significantly higher in the chamomile group compared with the control group. After 8 weeks, levels of HbA1c, HOMA-IR, and insulin were significantly lower in the chamomile group compared with the control group after adjusting for baseline values, duration of diabetes, intake of oral hypoglycemic agents, and changes of weight and calories during the study. In the chamomile group, levels of glucose, insulin, HbA1c, and HOMA-IR significantly decreased by 11.09% (P=0.004), 32.59% (P<0.001), 5.01% (P<0.001), and 39.76% (P<0.001), respectively. In the control group, glucose increased 5.1%, insulin increased 2.5% (P<0.001), HbA1c increased 0.78%, and HOMA-IR increased 7.79%.

The effects of chamomile tea on lipid profiles in these patients was previously reported.[1] After 8 weeks of consumption, serum levels of triglycerides decreased 18.35% vs. a 5.87% increase in the control group (P<0.001), total cholesterol decreased 9.56% vs. a 2.97% increase in the control group (P=0.001), and low-density lipoprotein cholesterol decreased 8.85% vs. a 5.68% increase in the control group (P=0.05). Compared with the control group, baseline levels of TAC (P=0.002), SOD (P=0.002), and GSH-Px (P<0.001) were significantly lower in the chamomile group, and MDA levels were significantly higher in the chamomile group (P=0.002).

After 8 weeks, analysis of covariance revealed statistically significant differences between the groups in TAC (P=0.04), MDA (P<0.001), and activities of CAT (P<0.001), GSH-Px (P=0.01), and SOD (P=0.001), after adjusting for baseline values, duration of diabetes, and changes in weight and calorie intake during the study. Compared with the control group, the chamomile tea group saw increases in levels of TAC (6.81%), SOD (26.16%), CAT (45.06%), and GSH-Px (36.71%), and decreased levels of MDA (33.23%). Compared with baseline, significant increases in serum levels of TAC (15.18%) and activities of CAT (36.52%), GSH-Px (49.52%), and SOD (32.5%) and a significant decrease in MDA levels (45.8%) were seen in the chamomile group.

In this study, the short-term intake of chamomile tea had beneficial effects on glycemic control and antioxidant status in patients with T2DM. However, the authors acknowledge the limitations of the study as being its single-blind design, single dosage, short study duration, and discrepancy regarding sex. Another limitation not mentioned is that there was no chemical analysis of the chamomile tea bags.

—Shari Henson

Reference

[1]Rafraf M, Zemestani M, Asghari-Jafarabadi M. Effectiveness of chamomile tea on glycemic control and serum lipid profile in patients with type 2 diabetes. *J Endocrinol Invest*. 2015;38(2):163-170.

The American Botanical Council has chosen not to include the original article.