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**File: ■ Cinnamon (*Cinnamomum verum*)
■ Type 2 Diabetes Mellitus**

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RE: Cinnamon Extract Supplementation Improves Blood Glucose Control in Patients with Diabetes

Lu T, Sheng H, Wu J, Cheng Y, Zhu J, Chen Y. Cinnamon extract improves fasting blood glucose and glycosylated hemoglobin level in Chinese patients with type 2 diabetes. *Nutr Res.* 2012;32(6):408-412.

The incidence of type 2 diabetes mellitus is increasing worldwide. Because it is a prolonged chronic metabolic disease that can cause other complications, its treatment costs place a huge burden on health systems. Developing an economical, efficient, and simple strategy to prevent and treat diabetes is a major challenge. Recent studies have demonstrated that cinnamon (*Cinnamomum verum*) is effective in improving blood glucose control in patients with type 2 diabetes. It has been used in China for thousands of years to treat many diseases, including diabetes. These authors conducted a 3-month, randomized, double-blind, clinical study to analyze the effect of cinnamon extract supplementation on the levels of fasting blood glucose (FBG) and hemoglobin A_{1c} (HbA_{1c}) in Chinese patients with type 2 diabetes.

The 69 enrolled patients (44 women and 25 men >48 years of age) were outpatients at Xuhui Central Hospital in Shanghai, China. They all had type 2 diabetes with levels of HbA_{1c} >7.0% and FBG >8.0 mmol/L (144 mg/dL). During the study, 3 patients withdrew, leaving 66 who were randomly assigned to one of 3 groups:

- the placebo group (n=20), who received 2 control tablets daily;
- the low-dose group (n=23), who received 2 cinnamon tablets daily, each containing 60 mg of cinnamon extract;
- or the high-dose group (n=23), who received 6 cinnamon tablets daily, each containing 60 mg of cinnamon extract.

The cinnamon tablets used were developed by Shanghai Yitian Bio-Scientific Co., Ltd. (Shanghai, China) and were produced by Shanghai Jinsijia Health Care Food Co., Ltd. (Shanghai, China).

All patients were taking gliclazide during the study period. They received weekly telephone calls from the hospital's medical staff to discuss their medication.

After a 10-hour fast, the patients had their blood drawn for the measurement of HbA_{1c}, FBG, total cholesterol, triglyceride, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, aspartate transaminase (AST), and alanine aminotransferase (ALT) levels.

The authors reported no significant change in the placebo group in HbA_{1c} or FBG levels from baseline to the end of the study; however, both HbA_{1c} and FBG levels were significantly reduced in the other 2 groups:

- In the low-dose group, the HbA_{1c} level decreased from 8.90% to 8.23% (P=0.003) and the FBG level decreased from 9.00 mmol/L to 7.99 mmol/L (162 mg/dL to 143.82 mg/dL) (P=0.02).
- In the high-dose group, the HbA_{1c} level decreased from 8.92% to 8.00% (P=0.0004) and the FBG level decreased from 11.21 mmol/L to 9.59 mmol/L (201.78 mg/dL to 172.62 mg/dL) (P=0.00008).

Of the other parameters measured, only the triglyceride level was significantly reduced, in the low-dose group (P=0.007). In the placebo group, total cholesterol (P=0.042) and ALT (P=0.028) levels increased slightly.

The authors compared these results to those of 8 other clinical studies. The 3 most recent studies (including this one) found that cinnamon or its extract was able to significantly reduce HbA_{1c} levels in patients. Some of the earlier studies reported improved FBG levels with cinnamon or cinnamon extract.

Several differences are noted between the earlier studies and the one reported here. In this study, all patients were taking the same prescribed antidiabetic medication to minimize the potential interference of different types of medications on the effect of the cinnamon. Patient baseline HbA_{1c} and FBG levels were relatively high in this study compared with the other studies. A strength of this study was that the study duration was long enough to evaluate hyperglycemic status by using HbA_{1c} as a biomarker. After comparing their study results with those of the other studies identified, the authors conclude, "It appears that cinnamon supplements demonstrate a maximal effect on blood glucose control when FBG and HbA_{1c} levels are relatively high at the beginning of the treatment."

Noting that the effect of cinnamon on blood glucose control is likely dependent on the form of cinnamon used, the authors stress the importance of identifying the active component of cinnamon and elucidating its molecular mechanism responsible for its effect on insulin sensitivity.

"We propose that cinnamon be considered a promising supplement for the therapy of type 2 diabetes when hyperglycemia cannot be satisfactorily controlled by other strategies such as diet, exercise, and prescribed medication," the authors conclude.

—*Shari Henson*

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

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