



HerbClip™

Shari Henson
Heather S Oliff, PhD

Brenda Milot, ELS

John Neustadt, ND4
Densie Webb, PhD

Executive Editor – Mark Blumenthal *Consulting Editors* – Dennis Awang, PhD, Steven Foster, Roberta Lee, MD

Managing Editor – Lori Glenn

Funding/Administration – Wayne Silverman, PhD *Production* – George Solis/Kathleen Coyne

FILE: ■Ginkgo (*Ginkgo biloba*)
■Skin Blood Flow
■EGb 761

HC 010352-281

Date: May 31, 2005

RE: Small Study Demonstrates that EGb 761 Can Exert Either Dilatory or Constrictive Effects on Blood Vessels

Boelsma E, Lamers RJ, Hendriks, HFJ, van Nesselrooi, J, Roza L. Evidence of the regulatory effect of *Ginkgo biloba* extract on skin blood flow and study of its effects on urinary metabolites in healthy humans. *Planta Med.* 2004;70:1052–1057.

For at least 1,000 years, ginkgo (*Ginkgo biloba*) has been part of the Chinese medicinary, and modern research has shown, among other indications, that ginkgo significantly improves blood flow to the eye in people with type 2 diabetes,¹ and may benefit people with Alzheimer disease.² The goal of the present study was to test the effects *G. biloba* extract EGb 761 (Dr. Willmar Schwabe GmbH, Karlsruhe, Germany) on skin blood flow and on any effects on urinary metabolites.

Twenty-seven "healthy" women and men (55-74 years old, mean age 61 years) were randomized to take either placebo or EGb 761 standardized to 25.6% flavonoid glycosides and 7% terpenoids or placebo for 3 weeks in 3 divided doses of 80 mg each, ingested with breakfast, lunch, and dinner. The groups were then switched, and the volunteers taking EGb 761 were given placebo, and those who had taken placebo began taking EGb 761 for another 3 week trial period. Skin blood flow measurements were assessed on the forefoot using a laser Doppler flowmeter, while urinary metabolite profiles were determined by a combination of nuclear magnetic resonance (NMK) spectroscopy and multivariate data analysis (MVDA), a method of analysis that allows identification of specific metabolic responses.

Supplementation with EGb 761 significantly decreased mean blood flow from baseline (10.4 ± 6.7 perfusion units (pu) to 7.1 ± 4.4 pu ($P < 0.01$) compared to placebo. Peak blood flow also significantly decreased with EGb 761 supplementation (20.9 ± 16.8 pu) compared to placebo (29.1 ± 19.0 pu; $P < 0.01$). However, 7 of the subjects had an increase in blood flow after supplementing with EGb 761 compared to baseline. Those subjects who had the lowest baseline blood flow rate had the largest increase in blood flow after taking EGb 761.

Metabolic fingerprinting revealed different relative concentrations of metabolites in the urine of subjects during the placebo phase, the EGb 761 phase, and in the urine of those subjects whose blood flow decreased or increased during EGb 761 supplementation. Subjects in the placebo phase showed a relative abundance of glutathione, "sugars," "amino acids," and nicotinate/nicotinamides. The predominant metabolites in the urine of subjects who supplemented with EGb 761 were glutamine/glutamate and tryptophan. The metabolites most abundant in the urine of subjects whose blood flow decreased during EGb 761 supplementation were arginine, praline, lysine, ornithine, phenylalanine, tyrosine, cinnamic acid, and nicotinate/nicotinamides. The predominant metabolites in the urine of those whose blood flow increased during supplementation were "sugars and amino acids."

The effect of EGb 761 on blood flow in these middle-aged subjects was proportionally correlated with baseline blood flow values measured after treatment with placebo: subjects with the highest resting blood flow values (17) registered a decrease in flow following treatment with ginkgo extract; those with moderate blood flow (3) showed no change, while subjects with the lowest resting blood flow (7) experienced a slight increase after ingesting EGb 761. While the numbers in each cohort are very small, especially the latter-two, these observations suggest that the extract can exert either dilatory or constrictive effects on blood vessels, likely dependent on individual physiological and pathological parameters.

—John Neustadt, ND4

References

- ¹Huang SY, Jeng C, Kao SC, Yu JJ, Liu DZ. Improved haemorrhological properties by Ginkgo biloba extract (Egb 761) in type 2 diabetes mellitus complicated with retinopathy. *Clin Nutr.* Aug 2004;23(4):615-621.
- ²Gertz HJ, Kiefer M. Review about Ginkgo biloba special extract EGb 761 (Ginkgo). *Curr Pharm Des.* 2004;10(3):261-264.

Enclosure: Referenced article reprinted with permission from Georg Thieme Verlag.

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.