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**File: ■ Ginkgo (*Ginkgo biloba*)**
**■ Neuropsychiatric Disorders**
**■ Adjunctive Therapy**

**HC 081352-487**

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**RE: Evidence of Ginkgo Extract Efficacy in Patients with Dementia and as an Adjunct for Treating Patients with Chronic Schizophrenia**

Brondino N, De Silvestri A, Re S, et al. A systematic review and meta-analysis of *Ginkgo biloba* in neuropsychiatric disorders: From ancient tradition to modern-day medicine. *Evid Based Complement Alternat Med*. 2013;2013:915691. doi: 10.1155/2013/915691.

Ginkgo (*Ginkgo biloba*) is one of the most popular phytomedicines; however, according to the authors, there has been no systematic review on its effect on neuropsychiatric disorders other than dementia. Hence, the purpose of this report was to conduct this systematic review.

The authors searched Medline, Embase, PsycINFO, and the Cochrane Database of Systematic Reviews from inception through April 2012. The search terms were gingko biloba, ginkgo, ginko, gingko, bilobalid*, egb 761, dementia, cognitive impairment, Alzheimer, autism, autistic spectrum disorder, schizophrenia, psychosis, psychotic disorder, delusion, depression, major depression, depressive symptom, anxiety, generalized anxiety disorder, anxious, attention deficit disorder, ADHD, attention deficit, hyperactivity, and addiction. All search terms were searched individually in each database and combined together. The search strategy was limited to articles in English, Italian, French, Spanish, and German. All recovered papers were reviewed for additional relevant references. Study inclusion criteria were controlled, randomized clinical trials; a minimum of 10 patients/group; and treatment for ≥ 6 weeks. When possible, the data were pooled for a meta-analysis.

A total of 1,109 studies were identified; 113 were obtained for additional evaluation; and 18 met the inclusion criteria and were included in this review. There was 1 randomized, double-blind study in patients with attention-deficit and hyperactivity disorder, which included 50 children treated with 80 mg/day (if < 30 kg) or 120 mg/day ginkgo compared with methylphenidate for 6 weeks. Methylphenidate was much more effective than ginkgo, though the latter had significantly less adverse side effects. There was 1 randomized, placebo-controlled study in patients with autism, which included 47 children who were treated with risperidone and in addition either 80 mg/day (if < 30 kg) or 120 mg/day ginkgo extract or placebo for 10 weeks. There was no significant difference

between groups which means that no added effect to risperidone could be shown for ginkgo extract. There was 1 randomized, double-blind, placebo-controlled study in patients with cocaine addiction, which included 44 patients who received either 240 mg/day ginkgo, piracetam, or placebo for 10 weeks. There was no significant difference between the 3 groups. There was 1 randomized, placebo-controlled study in patients with generalized anxiety disorder (GAD) or adjustment disorder with anxious mood who were treated with 240 mg/day ginkgo, 480 mg/day ginkgo, or placebo for 4 weeks. There was a significant dose-response improvement in the ginkgo-treated patients compared with placebo-treated patients. There was 1 randomized, placebo-controlled study in medicated patients who had chronic schizophrenia with tardive dyskinesia who were treated with 240 mg/day ginkgo or placebo for 12 weeks. The ginkgo group had a significant improvement in the Abnormal Involuntary Movement Scale, but not on a secondary outcome, namely the psychopathological scales, as also the placebo group showed an improvement over time.

There were 3 other randomized, controlled studies in patients with chronic schizophrenia treated with ginkgo extract and either clozapine, haloperidol, or olanzapine, and these data were pooled for meta-analysis. The studies with clozapine and haloperidol were double-blind, placebo-controlled (n = 42 and n = 109), and the other was olanzapine-controlled (n = 29). The pooled analysis favored ginkgo; however, the results had substantial heterogeneity (in other words, when looking at the individual outcome measures not all outcomes favored ginkgo treatment).

There were 10 studies of dementia; 8 placebo-controlled and 2 donepezil-controlled. Only the 8 placebo-controlled studies (120 or 240 mg/day ginkgo for 12-52 weeks) could be included in a meta-analysis. All used the standardized extract EGb 761® (Dr. Willmar Schwabe GmbH & Co. KG; Karlsruhe, Germany). The methodological quality of the 8 studies was judged to be "adequate." The pooled data showed that the Alzheimer's Disease Assessment Scale-cognitive subscale (ADAS-cog) and Syndrom-Kurz test (SKT) outcome measures favored ginkgo treatment. There was a significant difference in activities of daily living (ADL) standardized change scores between treatment groups when combining different scales: the Alzheimer's Disease Activities-of-Daily-Living International Scale (ADL-IS), Geriatric Evaluation by Relatives Rating Instrument (GERRI), Gottries-Bråne-Steen-Activities of Daily Living (GBS-ADL) scale, Nürnberger Alters-Alltagsaktivitäten-Skala (NAA), and Nürnberger Alters-Beobachtungsskala (NAB). The 2 studies comparing donepezil and ginkgo showed no significant differences between treatments.

The authors conclude that the general lack of evidence prevents drawing conclusions for most neuropsychiatric conditions. However, the meta-analysis of dementia studies shows that ginkgo provides benefits for cognition and ADL. The authors state that the benefits in both dementia and schizophrenia were modest and that some studies showed statistical improvements that were not necessarily clinically meaningful. Nonetheless, the authors conclude that despite heterogeneous results, the evidence supports the use of ginkgo in patients with dementia and as an adjunct therapy for patients with schizophrenia.

*—Heather S. Oliff, PhD*

Referenced article can be found at www.hindawi.com/journals/ecam/2013/915691.