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Ginkgo biloba *(also known as Maidentree hair or ginkyo)*

Common Indications:

- Antioxidant
- Premenstrual syndrome (PMS)
- Anti-inflammatory
- Generalized anxiety disorder (GAD)
- Asthma
- Migraine

General Comments:

Almost facing extinction, gingko became one of the world's oldest living species. It survived in Asia and is used to aid in the treatment of asthma, chilblains and indigestion. After technology was able to isolate the active compounds, ginkgo became one of the most prescribed medications in Europe while in the United States, it is sold only as a nutritional supplement[1,2].

Benefits & Mechanism of Action:

ANTI-INFLAMMATORY & MIGRAINE

Ginkgo has been shown to reduce prostaglandin E_2, TNF-α, and NO production. Animal studies showed reduced inflammation (via reduced iNOS, COX-2 and TNF-α) and reduced inflammatory stress. Inflammatory cytokines (IL-6) were inhibited and anti-inflammatory cytokines were promoted. For migraines prevention, ginkgo has shown promise both with and without an aura, but studies have been conducted with CoQ-10, vitamin B_2 with or without magnesium[1].

ANTIOXIDANT

Ginkgo has been shown to fight oxidative stress and aging by inhibiting xanthine oxidase that interferes with O_2 formation, scavenging hydroxyl radicals which is highly-reactive and toxic to cell membranes, and limiting the accumulation of nitrite. All of the processes are dose-dependent. Treatment with ginkgo in rats prevented an increase of the GSSG:GSH ratio and the oxidative damage to the mtDNA that naturally occurs during aging. When applied topically to the skin, ginkgo increases the activity of the enzyme superoxide dismutase enhancing the skin's natural defense and reducing UV radiation[1,3].

PREMENSTRUAL SYNDROME (PMS)

Ginkgo works by increases blood circulation and maintaining the balance of prostacyclins. It is also an inhibitor of MAO and thromboxane A2 methyl esterase, therefore, improving mood and decreasing the symptoms of depression. Being an inhibitor of lipoxygenase and cyclooxygenase, inflammatory prostaglandins, ginkgo has an anti-inflammatory effect. The quercetin present inhibits histamine release. Ginkgo is a vasodilator and stimulates blood flow. All of these mechanisms work together to reduce the severity of symptoms. Benefits include reducing the breast and neuropsychological (irritability and aggression) symptoms[4].

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Ginkgo has been shown to reduce airway hyperreactivity and improve symptoms and pulmonary function. When combined with fluticasone propionate, there was a significant decrease in eosinophils and lymphocytes and airway inflammation compared to monotherapy. It is also shown to suppress NF-κB gene expression[1,5].

GENERALIZED ANXIETY DISORDER (GAD)

Anxiety has multiple hypotheses. One is that there are insufficient levels of monoamine neurotransmitters in the brain to combat that ginkgo is thought to increase monoamine neurotransmitter levels, therefore, improving mood. Another hypothesis deals with oxidative stress, and ginkgo is a powerful antioxidant which protects erythrocytes from damage and allows higher O_2 supply and energy production. Ginkgo has been shown to alleviate stress, improving fatigue, physical endurance and the activities of daily living[1,6].

Functions:

- Vasodilator and to improve blood flow which occurs rapidly.
- Increase the reuptake of serotonin but not dopamine.
- Antiatherosclerotic effect: cholesterol-lowering effect via HMG-CoA reductase
- Neuroprotection: protects cerebral tissues from ischemia/reperfusion damage when used as prophylaxis.
- Cardioprotection: pretreatment reduces ischemic myocardial injury

Dose:

- 120-480mg daily, divided into 1-3 doses depending on indication.
- Gingko takes anywhere from 4-6 months to reach maximal efficacy.

Standardization:

Ginkgo is standardized to include 22-27% flavone glycosides, 5-7% terpene lactones (2.8-3.4% ginkgolides A, B and C, and 2.6-3.2% bilobalide) and ginkgolic acid must be less than 5ppm to prevent allergic reactions.

Cautions & Side Effects:

- CAUTION!!! Ginkgo interacts with many kinds of drugs including: antidepressants, antipsychotics, platelet inhibitors, warfarin, antiseizure drugs and some chemotherapy

(adriamycin, bleomycin, cisplatin, and doxorubin).
- Ginkgo should also be used with caution in individuals with known risk factors for cerebral hemorrhages and uncontrolled epilepsy.
- Stop ginkgo immediately if unusual bleeding or bruising occurs.
- Pregnancy and breastfeeding safety data have not been established.

References:

GENERAL ROLE, ANTI-INFLAMMATORY & MIGRAINE

1. Braun L, Cohen M. Ginkgo Biloba. In: *Herbs and Natural Supplements: an Evidence-Based Guide*. Vol 2. 4th ed. Elsevier; 2015: 415-434.

2. Ginkgo biloba. Lexicomp. https://online.lexi.com/lco/action/doc/retrieve/docid/fc_rnp2/3750163?searchUrl=/lco/action/search?t=name&q=Ginkgo&ac=false&va=gingko#monograph-tab-content. Published July 12, 2019. Accessed July 18, 2019.

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3. Droy-Lefaix MT. Effect of the antioxidant action of Ginkgo biloba extract (EGb 761) on aging and oxidative stress. AGE. 1997; 20:141-149.

PREMENSTRUAL SYNDROME (PMS)

4. Ozgoli G, Selselei EA, Mojab F, Majd HA. A randomized, placebo-controlled trial of Ginkgo biloba L. in treatment of premenstrual syndrome. Journal of alternative and complementary medicine (New York, N.Y.). 2009; 15:845-851.

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5. Tang Y, 唐以军, 徐永健, et al. The effect of Ginkgo Biloba Extract on the expression of PKCα in the inflammatory cells and the level of IL-5 in induced sputum of asthmatic patients. Journal of Huazhong University of Science and Technology. 2007; 27:375-380.

GENERALIZED ANXIETY DISORDER (GAD)

6. Alsmadi AM, Tawalbeh LI, Gammoh OS, et al. The effect of Ginkgo biloba and psycho-education on stress, anxiety and fatigue among refugees. Proceedings of Singapore Healthcare. 2018; 27:26-32.