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# The benefit of Ginkgo Biloba for Dementia

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**A B S T R A C T**

Dementia is a chronic progressive brain illness syndrome defined by the loss of numerous cognitive processes, including memory, aphasia, apraxia, agnosia, and executive function. Consciousness is usually unaffected. Psychological and behavioral issues are sometimes present. Dementia is caused by a number of diseases and accidents that affect the brain, either directly or indirectly, such as Alzheimer's disease or stroke. Vascular dementia is a loss of thinking capacity caused by disorders that impede blood flow to certain parts of the brain, depriving brain cells of oxygen and nutrients. After Alzheimer's disease, vascular dementia is the second most frequent kind of dementia. This case study looks at a 76-year-old woman who has vascular dementia. The goal of pharmacological management with risperidone in low doses, as well as psychotherapy, in patients, is to preserve and maximize function, reduce behavior problems, relieve caregiver stress, and delay advancement to the next level. Ginkgo Biloba is one of the plants classified as phytopharmacology or medicines derived from of the plant Ginkgo biloba Plant G. biloba (Gb) is included in the family Ginkgoaceae. The G. biloba extract has antioxidant, antiviral, anti-inflammatory, and anti-carcinogenic properties. And also have it was stated that G. biloba extract had a good effect on the function of the CNS (central nervous system).

## 1. Introduction

Dementia is a chronic progressive brain illness syndrome defined by the loss of numerous cognitive processes, including memory, aphasia, apraxia, agnosia, and executive function. The clinical diagnosis of dementia is made based on neurobehavioral history, neurological physical examination, and pattern of cognitive impairment. There are 35.6 million people with dementia in the 20th doubling every 20 years, to 65.7 million in 2030 and 115.4 million in 2050. While in Southeast Asia, the estimated number of people with dementia increased from 2.48 million in 2010 to 5.3 million by 2030. There are five general subtypes of dementia, namely Alzheimer's disease, vascular dementia, Lewy body dementia, and dementia Parkinson's disease, frontotemporal dementia, and mixed types.[2] Alzheimer's type dementia has the highest prevalence (50-60%), followed by vascular dementia (20-30%).

Therefore, it takes a quick and precise effort in handling neurological disorders, as well as good prevention efforts so that it can reduce the prevalence of the disorder in neurology in society. In that case, in addition to treatment with drugs, it can also be done by consuming some herbal plants.[2]

One of the plants belonging to phytopharmaceuticals or drugs that are derived from the plant is Ginkgo biloba. In several studies, G. biloba is known to have the effect of beneficial in some neurology diseases. G. biloba (Gb) plants including in many families Ginkgoceae grows wild in China and is used for traditional medicine. This plant was first brought to Europe in 1700 and in the last two decades. The effectiveness of this plant has been widely studied in America and Europe in terms of medicine. Until

now, G. biloba plants are available in pill form which is often prescribed in Germany and France. Extract sale G. biloba reached 50% of the group of medicines derived from plants (phytopharmaceutical). This may be due to because of the good reputation regarding the efficacy of this drug as well as the presence of sympathy society towards drugs phytopharmaca, besides that also because of its relatively cheap price.[3]

**Dementia**

Dementia is commonly characterized as a progressive cognitive disorder that results in the loss of independence. There are five general subtypes of dementia, namely Alzheimer's disease, vascular dementia, Lewy body dementia, and dementia Parkinson's disease, frontotemporal dementia, and mixed types. Alzheimer's type dementia has the highest prevalence (50-60%), followed by vascular dementia (20-30%). The normal pattern of amnestic Alzheimer's disease, the most prevalent neurodegenerative presentation of dementia, is recognized to most doctors. Atypical dementia presentations, such as atypical Alzheimer's disease variations, can be difficult to diagnose even for experienced clinicians. The majority of patients with Alzheimer's disease (AD) appear with a classic anterograde amnestic state, with social graces retained. The most striking clinical hallmark of typical AD on formal neurocognitive testing is a pattern of memory loss correlating to the mesial temporal lobe. Patients lose new information quickly, and cueing has minimal effect on memory. Patients with Alzheimer's disease, on the other hand, are likely to have problems in at least one other cognitive domain. Furthermore, there are well-known atypical types of AD with mostly visuospatial, linguistic, or frontal/executive traits. Vascular dementia is a decrease in cognitive and functional decline caused by cerebrovascular disease, usually hemorrhagic and ischemic stroke, too caused by white matter disease ischemia or sequelae of hypotension or hypoxia.[1,4]

Symptoms of dementia are divided into two groups, namely cognitive impairment, and non-cognitive disorders. Cognitive impairment consists mainly of memory impairment ability to learn new things. Old memory may be impaired in advanced dementia. Non-cognitive complaints include complaints of neuropsychiatric or behavior group neuropsychological symptoms of dementia. In patients, there is a decrease in memory and thinking abilities, which interfere with someone's daily activities or impaired executive function. Recommended non-pharmacological therapies include behavior management, cognitive stimulation, reality-oriented therapy, activities recreational activity, and intervention programs for patient caregivers. Recommended pharmacological therapy forgiven is a cholinesterase inhibitor class of drugs, namely donepezil, galantamine, rivastigmine, and ginkgo biloba could considered use, but still in the research stage.[1,4]

**Ginkgo biloba**

Ginkgo biloba plants are common too called the maidenhair tree, called “living fossil” because of the species is the only member of the family extant Ginkgoaceae. This plant has been used as herbal medicine since the late 15th century in China. G. biloba extract is known to contain about 300 chemicals, but the function of each of these chemicals is not yet known clearly. G. biloba extract contains antioxidants, antiviral, anti-inflammatory, and anti-carcinogenic. And also have It was stated that G. biloba extract had a good effect on the function of the CNS (central nervous system). There are 2 most active substances in Egb761 extract, namely terpenoids and flavonoids. The standard formulation contains 24% flavonoid glycosides. Flavonoids are low molecular weight herbal polyphenol compounds that form a large family, providing antioxidant effects by neutralizing peroxyl, per hydroxyl, and hydroxyl radicals. Ginkgolic acid, the toxic phenolic compound in EGb761, has a plasma half-life of 4-5 hours and is implicit in allergic effects and immunotoxic. In humans, it is recommended that standard GB extract is used at a dosage 240 mg/day is safe and has no interaction with

clinically nonphytomedications.[3]

**The benefit of Ginkgo biloba for dementia**

G. biloba extract contains powerful antioxidants in protecting vascular endothelial cells from stress oxidative by eliminating free radicals. Not only that, increase cerebral and peripheral blood flow through modulation of blood flow, reduce vascular permeability, direct activation of the nervous system through neurons, and also lower platelet aggregation by blocking the reaction biochemistry in platelets can be done by G.biloba in enhancing the effect neuroprotective. It is also known that there is an anti-inflammatory effect in the extract of G. biloba which is related to the inhibition of cyclooxygenase (COX) and lipoxygenase which are played by the flavonoid substances in it. Ginkgetin (a biflavone from G. biloba leaf) inhibits phospholipase-A2, hydrolyzes membrane glycerophospholipids, and COX2-dependent prostaglandin D phase to release arachidonic acid (a precursor to eicosanoids), prostaglandins and leukotrienes. In addition, ginkgolide A and B (G. biloba flavonoids) inhibit proinflammatory cytokines such as TNF-α and IL-1.3 Platelet activation factor (PAF) stimulates leukotriene synthesis involved in the pathogenesis of the inflammatory process. Ginkgolide B is a potent PAF receptor antagonist that is thought to have a neuroprotective (neuroprotective) effect on the CNS (central nervous system). It is also known that G. biloba activates an erythroid-linked signaling pathway 2 factors 2 (Nrf2), which is recognized as a major molecular mechanism in protection against oxidative stress, and that deletion of its gene expression inhibits neuronal regeneration by stimulating phase II genes via Kelch-like ECH associated protein.[1.3,5]

In our body, nerve cells are known if they have been damaged or undergone a process of degeneration, it is certain that they cannot return to being good nerve cells. However, it has been found that the loss of nerve function caused by neurological disorders can be corrected or even cured with the treatment of nerve regeneration, which is concerned with neurons and glial cells. Based on clinical applications where Neural Stem Cells (NSCs) have been limited in number. EGb 761 extract exerts an effect on NSCs through its specific effect with Ginkgolide B on NSCs. There are several studies in which they investigated the relationship between Ginkgolide B dose and the differentiation of NSCs. The results also showed that EGb761 extract could fight free radicals, enhances neurogenesis and synaptic plasticity, stabilizes cell membranes, increases brain-derived neurotrophic factors, and also adapts to the required environment during the differentiation of stem cells into nerve cells.[3,5]

In the meta-analysis of randomized controlled trials, the results obtained a total of 1628 patients were randomized to the four trials. Of these, 1,598 patients (98%) had efficacy data after baseline (EGb 761®, 796; placebo 802). At baseline, there were no conspicuous differences between treatment groups with respect to demographic characteristics (mean age 66 years, standard deviation nine years, in both treatment groups; 67% and 68% females in EGb 761® and placebo group, respectively) and severity of dementia. Net changes between baseline and end of treatment for both composite and caregiver distress total scores were significantly larger in the patients treated with EGb 761® than in those receiving placebo. In four randomized, placebo-controlled trials, the efficacy of the quantified Ginkgo biloba extract EGb 761® was tested in patients who were suffering from dementia with clinically significant BPSD. Overall, in 9 out of 12 symptoms covered by the NPI significant benefits of EGb 761® in comparison to placebo could be demonstrated simultaneously for composite and caregiver distress over a period of 22 to 24 weeks.[6]

## 2. Conclusion

One of the plants classified as phytopharmaca or medicines derived from plants is Ginkgo biloba. Ginkgo biloba contains anti-oxidants that can improve the function of the nervous system and brain cells, in addition to lowering blood viscosity and improving

blood flow, especially in the nervous system and brain cells.

## 3. References


1. Asyrofi M Zur'an, Cahyaningsih Fibri Rokhmani. Laporan Kasus Demensia. Majority; 8(2).
2. Dominguez Ligia, Mario Barbagallo. Nutritional prevention of cognitive decline and dementia. Acta Biomed. 2018; 89(2): 276-290.
3. Sarifuddin M, Nurul Annisa. Kegunaan Ginkgo biloba untuk pengobatan penyakit neurologis. AL-IQRA MEDICAL JOURNAL; 2020; 3(1): 36-4.
4. Ljubenkov P, Michael D. Geschwind. Dementia. Department of Neurology, University of California, San Francisco (UCSF), Memory and Aging Center, San Francisco, California. Semin Neurol 2016; 36: 397–404
5. Weinmann S, dkk. Effects of Ginkgo biloba in dementia: systematic review and meta-analysis. BMC Geriatrics 2010; 10:14.
6. Egemen S, et al. Treatment effects of Ginkgo biloba extract EGb 761® on the spectrum of behavioral and psychological symptoms of dementia: a meta-analysis of randomized controlled trials. University of Zurich Main Library Strickhofstrasse 39 CH-8057.