Benefit of Ginkgo Biloba for Dementia

Citra Ananta Avis1*

1 Department of Neurology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

ARTICLE INFO

Keywords:
Dementia
Ginkgo Biloba

Corresponding author:
Citra Ananta Avis
E-mail address: drcitra.ananta@gmail.com

All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/ehi.v3i1.20

ABSTRACT

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 behaviour 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 dose, as well as psychotherapy, in patients is to preserve and maximize function, reduce behaviour 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 is Ginkgo biloba Plant G. biloba (Gb) is included in the family Ginkgoaceae. In the G. biloba extract has antioxidant, antiviral, anti-inflammatory, and anti-carcinogenic properties. And also 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 cognitive impairment. There are 35.6 million people with dementia in 2010 with doubling every 20 years, to 65.7 million in 2030 and 115.4 million in 2050. While in Southeast Asia, 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. 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 neurology in society. In that case, in addition to treatment with drugs, it can also be done by consuming some herbal plants.

One of the plants belonging to as phytopharmaceuticals or drugs that derived from the plant is Ginkgo biloba. In several studies, G. biloba is known to have the effect of beneficial in some neurology disease. G. biloba (Gb) plants including in many families Ginkgoaceae grows wild in China and is used for traditional medicine. This plant 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 medicines derived from plants (phytopharmaceutical). This may be due to because of the good reputation regarding efficacy of this drug as well as the presence of sympathy society towards drugs phytopharmaca, besides that also because relatively cheap price. 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 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 neuropsychiatric or behavior group neuropsychological symptoms of dementia. In patients there is a decrease in memory and thinking abilities, which to 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 for given is a cholinesterase inhibitor class of drugs, namely donepezil, galantamine, and rivastigmine and ginkgo biloba could consider its use, but still in 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. 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, perhydroxyl, 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 used at
dosage 240 mg/day is safe and has no interactions with clinically nonphytomedications.³

**Benefit of Ginkgo biloba for dementia**

*G. biloba* extract contain of powerful antioxidants in protects 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 lowers 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 is 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 factor 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. -1,²,³,⁵

In our body, nerve cells are known if they have been damaged or undergo 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 treatment 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 EGB 761 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.³,⁶

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


