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A REVIEW ON ROLE OF GINKGO BILOBA IN TREATING ALZHEIMER'S DISEASE

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ABSTRACT

Ginkgo biloba, also called maidenhair tree, is a deciduous gymnosperm tree of family Ginkgoaceae, the tree is native to China. Since ancient times ginko has planted in Chinese and Japanese temple gardens and now seen in many parts of the world as a fungus and insect-resistant ornamental tree. Ginkgo supplements are associated with several health claims and uses, most of which Improves the brain Functions, blood circulation Alzheimer's disease is a chronic disabling disease most prevalent among the neurodegenerative diseases. AD affects millions of people in worldwide and causes great burden to the society. It reduces Symptoms of Psychiatric Disorders and Dementia. It reduces the inflammation and also used in treatment of some kind of head ache. This review is to explore in detail about the role of ginko biloba in treating Alzheimer's disease.

KEYWORDS: Ginkgo biloba, Alzheimer's disease, Dementia.

INTRODUCTION

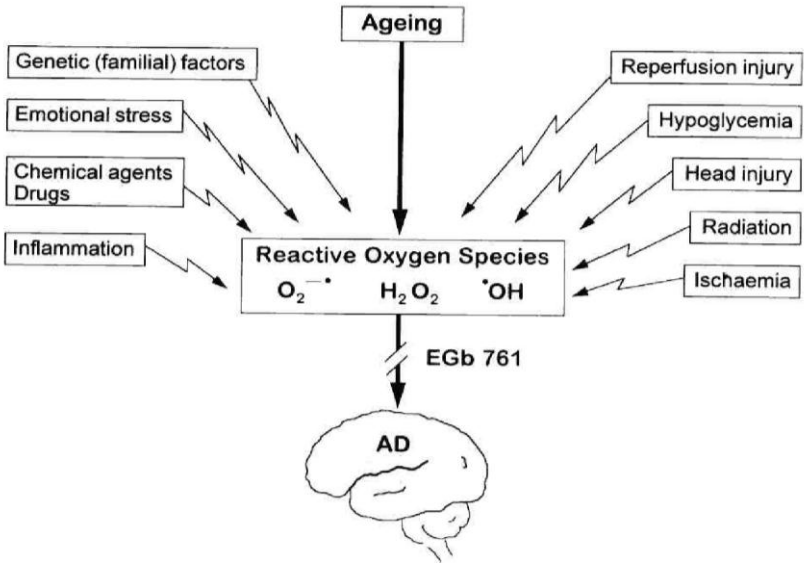
Alzheimer's disease is a chronic disabling neurodegenerative. It affects millions of people worldwide. The aetiology of Alzheimer's disease is multifactorial, and advanced age is the greatest risk factor. The pathological hallmarks of AD are Hyperphosphorylated tau and neurofibrillary tangles. Mechanisms like oxidative stress, mitochondrial dysfunction, Aβ

production, neurofibrillary tangles accumulation, inflammation, calcium mishandling, and hormonal imbalance plays a role in the disease process, thereby causing neuronal loss.[1] donepezil and memantine are the drugs mostly use in the treatment of AD. But side effects are reported for the drug. For the effective treatment of AD, lots of clinical research are conducting nowadays.

Ginkgo biloba originated in China. Leaves of Ginkgo Biloba is one of the most popular herbal medicine. It is included in the Chinese pharmacopoeia. It is used in the treatment of hypertension, ischemic myocardium, cerebral ischemia, Psychiatric Disorders, dementia. Chemical constituents of EGb are:22%–27% of flavone glycosides, 2.8%–3.4% of Ginkgolide A, B, and C, 2.6%–3.2% of bilobalide, and less than 5 ppm of ginkgolic acid.[2] 24% Flavonoids and 6% terpene lactones, 13% unknown substances of dry weight contain in a Standardized preparation of ginkgo leaves.[2] The 24% of flavonoids of EGb 761 are flavones, flavonols, tannins, flavones, glycosides like quercetin, kaempferol, isohamentin, myricetin and 3 methyl myricetin. Antioxidative, free radical scavenging, anti-amyloidogenic, anti-apoptotic properties are responsible for the prevention and treatment of AD. It provides a controversial result. Both positive and negative effect occurs in the study.

MECHANISM OF EGb IN AD

EGb 761® has different pharmacological actions that derive from the several constituents of the herbal extract, acting separately or synergistically. Flavonoid glycosides and terpene trilactones are the most pharmacologically important constituents in the treatment of cognitive decline.



EFFECTS OF GINKGO BILOBA

From various studies, it shows that Ginkgo Biloba extract has neuroprotective effects. Alzheimer's disease is resulted in neurodegeneration due to inflammation, oxidative stress, and neuronal apoptosis, most research focuses on preventing or treating these. Gingko Biloba minimized The loss of cognition and memory that triggers Alzheimer's disease.

Amyloidogenesis and AB Aggregation Protection

It is the main through which AD takes over the brain is AB plaque accumulation.AB toxicity induced to simulate AB plaque accumulation in AD. Toxicity induced in cultured cells exposed to solubilized peptides AB 25-35, AB 1-40 and AB 1-42. The treatment group stood exposed to both AB peptides and EGb 761. Where The Control group was exposed only to the AB peptides. A protective effect and inhibited cell apoptosis seen in were the group treated with the highest concentration of ginkgo Biloba exBiloba(100 µg/mL).

It also protects against the process of amyloid production i.e, amyloid genesis. EGb761 is to regulate the APP pathway. Release of alpha APP increases in the group treated with EGb761.

Mitochondria Function Protection

Another underlying mechanism of AD is related to is mitochondrial dysfunction. Against mitochondrial dysfunction, EGb shows positive neuroprotective effects.

Antioxidant Properties Also Provide Protection

EGb is often referred to as a free radical scavenger, meaning it can effectively attenuate the damage free radicals cause to cells. In this experiment lipid peroxidation in the striatum, hippocampus and substantia nigra of rats are measured. compared the untreated group with the group that had been treated when ith EGb 761, It shows a decrease in lipid peroxidation. Researchers concluded that the antioxidant capacity of EGb 761's is effective in this type of oxidation.

Anti Apoptotic Effect as Protection

Cell apoptosis is the main cause of neurodegenerative diseases like AD. Anti-apoptotic effects of EGb cause several intracellular signalling pathways which lead to apoptosis. component of ginkgo Biloba extracts bilobalide affects brain edemas can lead to brain cell apoptosis. Triethlytin induces oedema. cerebral edemas were reduced systemically when bilobalide was administered.

Effects on Cognition and Memory

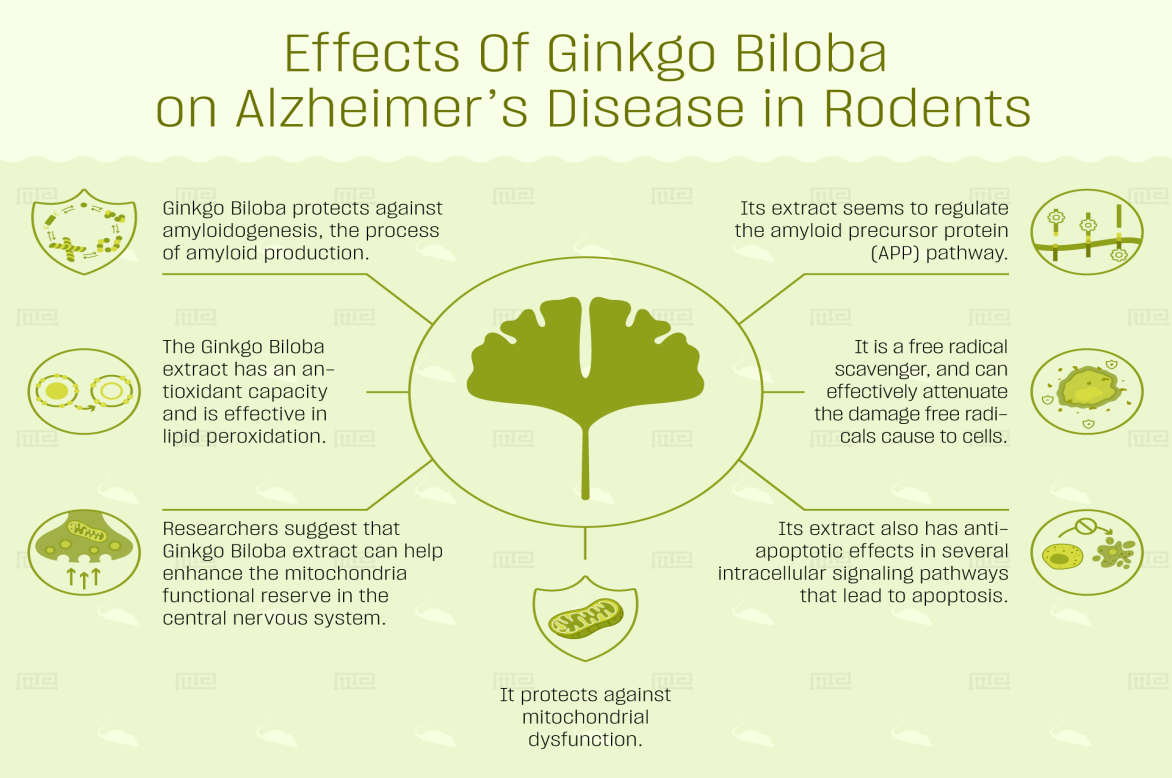
EGb improves learning and cognitive behaviour impairment.

Effects on Depression and Anxiety

EGb plays a role in diminishing depression-like behaviour. Test conducted in rats shows the reduced depressive-like behaviour which is associated with immobility. This means that EGb761 has antidepressant-like effects on rodents and the anxiety effect is also proven.

Locomotor Effects and Parkinson's Disease

The clinical studies carried out in A53T transgenic mice proved that EGb can aid and improve locomotion deficits in rodents with Parkinson's disease.



DISCUSSION

For a long time, EGb is therapeutically used for the treatment of cognitive decline, memory deterioration, and decreased alertness. This review aiming to evaluate the role of EGb in treating AD. Both positive and negative results have resulted from several studies.

POSITIVE RESULTS

A clinical study was conducted by Rigney et al. in 1999, to evaluate the effect of EGb. About 31 health volunteers randomly received 120 mg of EGb or 240 mg of EGb or placebo.

significant differences in reaction time, motor reaction time, and CFF occur after the administration of EGb, and EGb were more evident for memory than attention.[2]

To investigate the effects of acute doses of EGb on cognitive performance, Kennedy et al., in 2000 conducted a study. Healthy college students age group 19–24 years received doses of 120, 240, and 360 mg of EGb or placebo. Cognitive function as a consequence of ingestion of EGb or placebo measured by a tailored version of the CDR computerized assessment battery.[2] cognitive function was improved in several assessment substances as compared with placebo.[2]

In 1987,20 females and 34 males of the outpatient department received 120 mg of EGb or placebo for 12 weeks. The cognitive test battery and automated psychometric test battery are the test items included. Benton Visual Retention Test, Immediate Word Recall, Number Matching Task, Rapid Visual Information Processing Task, CRT, DSST, and Word Recognition were carried out. All tests were combined and measured using two different techniques, to avoid the limitations and one-sidedness of the result.[2] After administration of EGb for 12 weeks result shows that EGb was superior to placebo in cognitive tests. 1991, the Same results were quoted in another clinical trial.[2]

Several long term studies are also carried out to check the EGb role in AD.

NEGATIVE RESULTS

In 1984, Subhan conducted a clinical study based on the effect of EGb on cognitive function. EGb or placebo was administered to eight healthy females and the psychometric scale was tested after 1 h of administration Sternberg technique significantly improved with 600 mg EGb to placebo, and there was no difference CFF test, Choice Reaction Time and Leeds Analogue Rating Scales among those groups.

Based on Subhan's research, Lacomblez et al. in 1990, a clinical trial is conducted with healthy young female volunteers. Volunteers received 600 mg single doses of EGb or placebo, and a battery of tests was used after dosing. On CFF and CRT there were no statistical differences. Regardless, with the followed treatment the long-term memory was developed.

In 2004, a study was conducted where 20 were females and 19 males who were supplemented with 240 mg of EGb for 13 weeks. To evaluate cognitive function, alertness and

chemosensory function were used. The results indicate that EGb needs to improve the performance on the chemosensory, also it is ineffective at taste and smell function. EGb tablets may be ineffective due to quality control issues.

If the dose of EGb was more than 240 mg/day then a better therapeutic response occurs. From the review, it is clear that EGb has an important and effective role in AD.

CONCLUSION

Analysing Several studies and reviews concluded that ginkgo Biloba has an important role in the treatment of Alzheimer's disease. Studies are carried out nowadays also.in real its exact role is controversial. from analysing all the articles get a conclusion that Ginkgo Biloba extract has neuroprotective effects in Alzheimer's disease and minimized The loss of cognition and memory that triggers Alzheimer's disease**.**

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