



ALZHEIMER DISEASE AND USE OF HERBAL MEDICINES

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Abstract

Alzheimer disease is a disease which specifically affects human brain. This dysfunction becomes dreadful with growing age which can be benefited with symptoms like weakened memory, weaker learning process, swings in mood, judgements, decreases in social activities. In America around 5.8 billion people may be affected with this dysfunction in near future. This disease is mainly caused by mutation of genes named as Apolipoprotein E, Clusterin, Phosphatidylinositol binding clathrin assembly protein and Sortilin related receptor, Presenilin1 (PS1), Presenilin 2 (PS2) and Amyloid precursor protein (APP) and oxidative stress. In this article the use of herbal medicines viz-a-viz *Rhodiola crenulata*, *Schisandra chinensis*, *Ginkgo biloba*, Turmeric and Saffron which shows their magic to relieve different symptoms without any side effect or any adverse effects and improve the mental illness will be discussed.

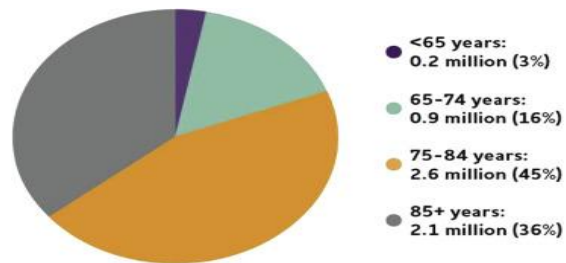
Key words: Alzheimer disease, gene mutation, symptoms, herbal medicines, *Rhodiola crenulata*, *Schisandra chinensis*, *Ginkgo biloba*, Turmeric and saffron.

Discussion

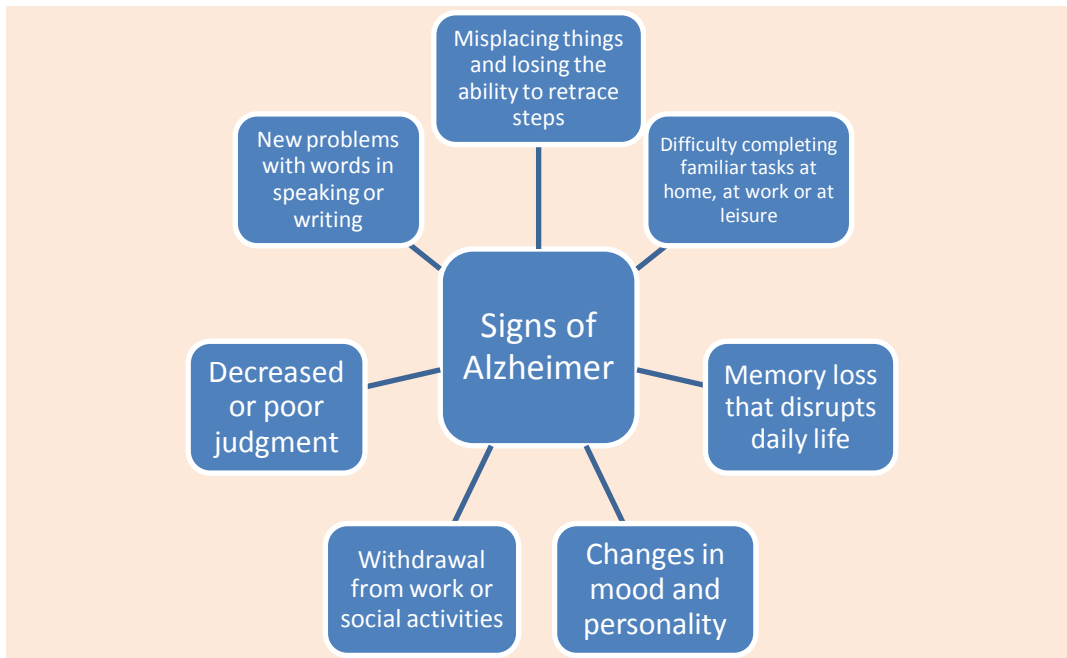
In normal healthy human brain, there are hundred number of neurons existing with hundred trillion synapses through which the coordination and communication is maintained between one to another nerve cell with the help of endocrine system. In the case of Alzheimer Disease, there is accumulation of beta amyloid plaque protein fragment, tau

tangles interfering the communication of neurotransmission from one nerve cell to another cell and also prevents nourishment of cell which causing cell inflammation and cell shrinkage and then impairs brain functioning.¹

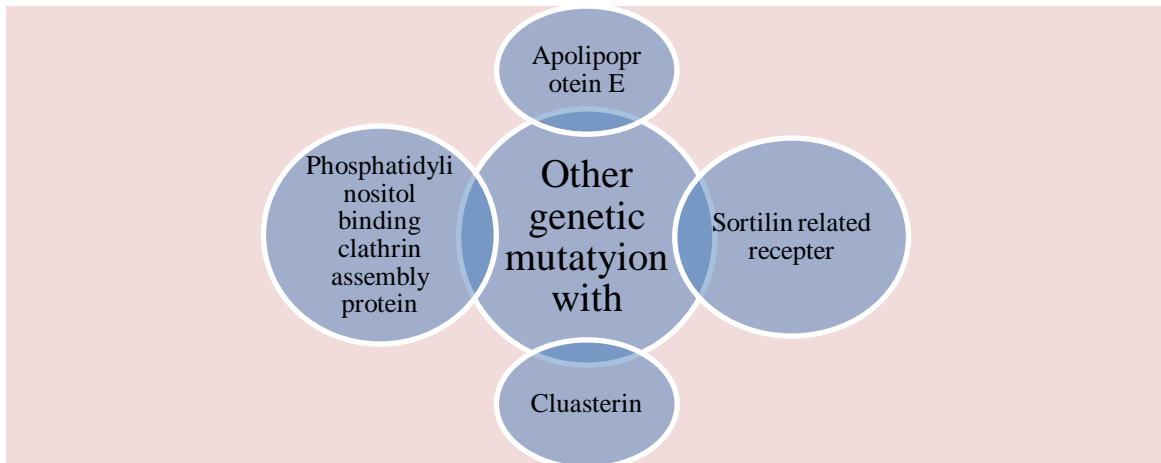
In America, estimated 5.8 million people are being affected with Alzheimer disease in 2019.^{2,3}



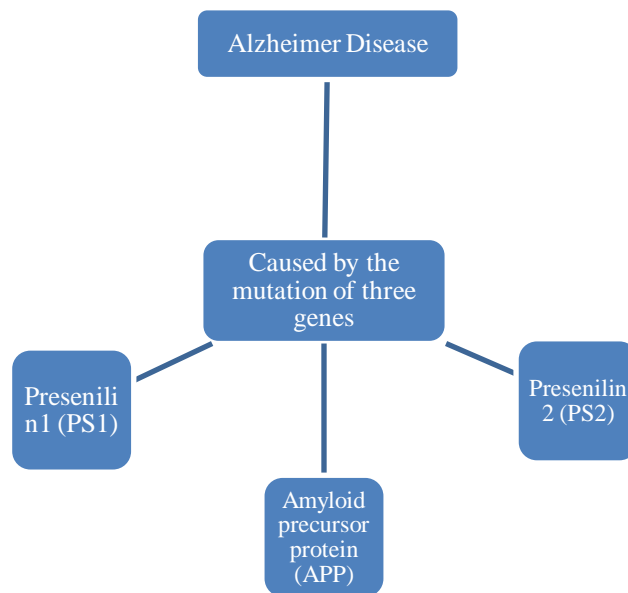
Sign and Symptoms of Alzheimer Disease

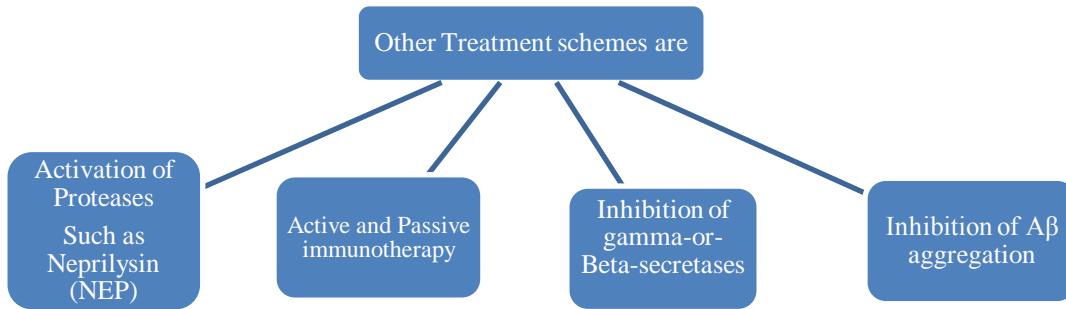
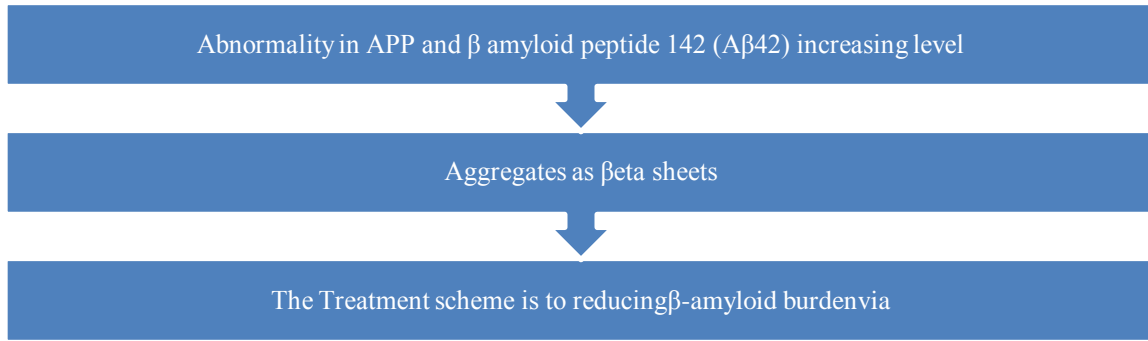


Genetic Mutations Associated with Alzheimer Disease

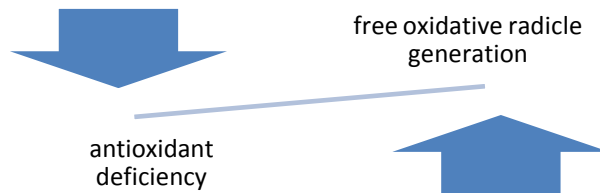


Disease Progression Chart











The unbalanced condition of free oxidative radicle generation and the deficiency of antioxidant in human body, generates the oxidative stress. Besides this, polyunsaturated fatty acids and high level of redox metal ion also causes stress which leads to Alzheimer Disease.^{4,5,6,7,8,9,10,11,12}



The Herbal Drugs Used for Alzheimer Disease are as follows:

Sr. No	Name of the Herbal Medicine	Appearance
1	<i>Rhodiola crenulata</i>	 A photograph of the Rhodiola crenulata plant, showing clusters of small, bright pink flowers with green, succulent-like leaves growing from a rocky surface.
2	<i>Schisandra chinensis</i>	 A photograph of Schisandra chinensis, showing clusters of bright red, round berries hanging from a woody branch.

Sr. No	Name of the Herbal Medicine	Appearance
3	<i>Ginkgo biloba</i>	
4	<i>Zataria Multiflora</i>	
5	<i>Thymus vulgaris</i>	

6	Turmeric	
7	Ashwagandha	

Rhodiolacrenulata

Rhodiola, an arctic root or golden root also known as scientifically *Rhodiolarosea*, growing in Europe and Asia mountain regions with antidepressant and anti-fatigue activity and widely used as nutritional food in China. The *Rhodiolacrenulata* extract, prepared by freeze-drying technology, improve the learning and memory deficits in the $A\beta_{1-42}$ -induced experimental rat models of Alzheimer Disease evaluated by the Y maze test and Morris water maze test and based on the against action of cholinergic deficiency, free radical generation or oxidative stress damage and activation of GSK3 β .¹³

Schisandra chinensis

Schisandra chinensis fruit is called as magnolia berry or five-flavor-fruit, which is commonly distributed in Northern China and the East Russian. It's a polysaccharide named Schisandra polysaccharide (SCP) is used for the treatment of age-related neurodegenerative disorders and also regulates to protecting the CNS, metabolism of intestinal microbials, energy metabolism, and promoting antioxidant activity. It reduces the phosphorylation of tau protein, the deposition of Amyloid beta and generation of free radicals or oxidative damage in the Alzheimer Diseased experimental rats by the Urinary Metabolomics Studies.¹⁴

Ginkgo biloba

Ginkgo biloba named living Fossil Tree, Kew Tree, Silver tree native tree of China consists very large number of antioxidants, useful in management of different diseases of arthritis, irritable bowel disease (IBD), cancer, heart disease, stroke, anxiety, eyes diseases, headache, migraine, premenstrual syndrome (PMS), sexual dysfunction, depression etc. The inhibiting activity of Ginkgo biloba on N-Methyl-De-Aspartate (NMDA) receptors and alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors shows the wonderful activity to fight against the Alzheimer disease.¹⁵

Zataria Multiflora

Zataria multiflora Boiss, well-known Avishan-e-Shirazi in Persian country that grows different countries like Iran, Pakistan and Afghanistan which demonstrations bags of pharmacological activities such as analgesic, carminative properties, anti-spasmodic, anti-oxidant, anti-bacterial, anti-tussive, and anti-inflammatory properties because of a rich source of oxygenated monoterpenes (consists of two major components-carvacrol and thymol) extracted out by the leaf, flowers and other aerial parts of plant. After the experiment on mentally disable forty male **rats**' model of Alzheimer disease, *Zataria multiflora* Boiss displays protective effect by reducing anti-cholinesterase enzyme activity in brain hippocampus and increasing the Brain-Derived Neurotrophic Factor levels without anti-oxidant property.^{16, 17}

Thymus vulgaris

Thymus vulgaris termed Thyme, distributed worldwide specially in Europe, Africa and Asia for the cold and cough treatment, diabetes treatment, antiseptic, antibiotic, antifungal, antiviral, astringent, digestant, anthelmintic, anti-inflammatory and analgesic properties. In the case of Alzheimer Disease, one of experimental study done on forty-two scopolamine-induced memory deficit on experimental male wistar rats via thyme extract acetylcholinesterase (AChE) inhibiting activity with beneficial effects of these major components such as thymol, carvacrol, 8-terpinene, p-cymene and α -pinene.¹⁸

Turmeric

Turmeric, an Indian medicinal traditional yellow golden root (Indian saffron and haldi), a part of food spices and having lots of pharmacological activities for example to boost up digestion, reduces oxidative free radicals damages, act on inflammation, treat skin infections, used in sore throat, cough, fever, rhinitis, bronchial infection, atherosclerosis, liver diseases, diabetes mellitus, immune disorder, cancer. It is used in the treatment of Alzheimer disease by the bio-active constituent curcuminoids, reducing the amount of deposition of plaque, inhibiting β -amyloid protein formation, preventing cholesterol formation in memory impaired experimental mouse.¹⁹

Ashwagandha

An Indian ginseng and Winter cherry, horse's smell (because it smells like sweat of horse) by means of anti-inflammatory, antioxidant, anticancer, immunomodulatory, adaptogenic, antidepressant and anxiolytic, neuroprotective, cardio tonic and hypolipidemic, antimicrobial, antimalarial, induces sexual behavior. The new property found in *Witheniasomenifer* is to treat Alzheimer disease with withanine, somniferine and steroidal lactones, withanolides, glycosides, withanosides main active chemical constituents onto the mentally retarded experimental mice by leading to increasing clearance of β -amyloid peptides.²⁰

Conclusion

Herbal preparations are being used for treatment of many diseases from ancient times. They may be categorized as medicines, poisons, and neuroleptic drugs, cardiovascular drug, gastrointestinal drugs, etc. There are so many sources through which drugs can be discovered they are plants, animals, minerals, modification of previous medicament formulary, gene therapy and modern immunogenic therapies are in latest trends. By advance literature search and laboratory trials it has been identified that the proper selection of herbs by knowing their physical and chemical properties can be used for treatment of several dreadful diseases like Alzheimer. The above listed herbs assist in preventing tau protein accumulation, inhibiting beta-amyloid formation, preventing cholesterol formation, inhibiting cholinesterase enzyme activity and promoting the synthesis of acetylcholine which mainly promotes the memory power and learning and by antioxidant activities. Therefore, more focus should be given on identification and screening of such drugs which can help in treating the conditions without causing side effects.

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