



Review Article

A REVIEW ON ALZHEIMER'S DISEASE AND ITS CONCEPTS IN AYURVEDA

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ABSTRACT

Alzheimer's disease is the form of dementia and usually occur in the old age. In Alzheimer's disease death of brain cells leads to memory loss. Modern science says A β (amyloid beta) is causative agent of Alzheimer's disease and also some infections, toxins and metabolic disorders. The cholinergic deficiency in this disease is responsible for most of the short term memory which leads to progressive loss of memory, deterioration of all intellectual functions, increases apathy, decreases speech function, disorientation and gait irregularities. Modern science have explained symptomatic treatment which may lead to adverse effects. Ayurveda has explained Alzheimer's disease under *Vatavyadhi* which may be cause due to imbalance of *Vatadosha*. Ayurveda has mentioned some herbs which are said as tonics for nervous system and memory enhancers which not only act on brain cells but whole nervous system. Exact mechanism of these drugs is not clear but some of them have valuable compounds that show their roles on pharmacological activities. Yoga and meditation is most helpful in disorders related to nervous system. According to research patients who performed meditation and yoga those had less atrophy in parts of the brain. This review article helps to know about Alzheimer's disease in modern and Ayurvedic view and some individual herbs and some new things which play a very crucial role in Alzheimer's disease.

KEYWORDS: Alzheimer's disease, cognitive disease, dementia, Ayurvedic herbs, yoga and meditation.

INTRODUCTION

Alzheimer's disease is said to be neurodegenerative disease which starts slowly and worsens as the time passes. The most common symptom seen in the disease is the short term memory loss.^[1,2] Alzheimer's is usually seen in age of 65 and above in which 4% to 5% cases are of early onset.^[3]

It is the most common cause of dementia. Dementia is loss of cognitive functioning- thinking, remembering and reasoning and behavioral abilities.^[4] According to World Health Organization (WHO), 35.6 million people are suffering from dementia worldwide and which may further increase to 115.4 million by 2050.^[5]

Discussing about the pathophysiology of Alzheimer's disease, in which we see injury and death of neurons, initiating in the hippocampus brain region, the atrophy affects entire brain. If to diagnose a disease, tangles inside and senile plaques outside cells throughout brain are observed after performing postmortem. Major constituent of plaque is said to be small, 40/42-amino acid peptide amyloid-beta (A β). A β is said causative agent of Alzheimer's disease.^[6]

According to some research studies acetylcholine transferase and acetylcholine esterase

may be responsible for degradation of acetylcholine synthesis.^[7,8]

Stages of Alzheimer's disease^[9] are mentioned below.

Early Stage

1. Goings-on forgetfulness
2. Confusion

Middle Stage

1. Difficult to recall
2. Deepened Confusion
3. Disorders related to sleep

Late Stage

1. Difficulty in speaking
2. Self-reproach of things
3. Distressed

Other Causes

1. Infections and Toxins

AIDS-dementia complex (ADC) is probably the most significant one in this category. It occurs in the

late stages of AIDS and probably represents the end stage of the disease. In toxins such as CNS depressants like benzodiazepines, conventional antipsychotics, and anticholinergics may lead to dementia.

2. Metabolic and Nutritional Diseases

Vitamin B₁₂ deficiency is associated with progressive psychosis and subtle cognitive impairment. Pellagra presents with dementia and dermatitis and is mostly seen in the malnourished and the alcoholics.

Ayurveda has mentioned the concept of *Tridosha (Vata, Pitta, Kapha)* and even all diseases occur due to imbalance of *Tridoshas*. If to correlate Alzheimer's disease with Ayurveda, it has mentioned nervous system disorders under *Vatavyadhi* which can be said Alzheimer's is caused due to imbalance of *vata*.^[10]

Explaining the *Samprapti (pathophysiology)* of Alzheimer's disease, which affects the *vata* in the tissues of body and after that brain slowly becomes imbalanced.^[11] Even this can be considered that carrier of three *Gunasatvik, Rajasik, Tamsik* gets disturbed and may be imbalanced. These days lifestyle should be also kept in mind which can also be one of the factor to cause Alzheimer's disease.^[12]

What's New in Alzheimer's disease?

Researchers are looking for susceptibility genes that may influence when a person gets the disease and how fast it progresses. They also hope to identify genes that influence specific biomarkers related to Alzheimer's Disease, such as the amount of amyloid plaques or neurofibrillary tangles, concentrations of amyloid beta and tau in cerebral spinal fluid, the rate-of-disease progression, and responses to environmental factors such as drugs.^[13]

Investigations

1. Blood Investigations

Haemogram and peripheral smear to look for anemia, vitamin B₁₂ deficiency. LFTs to rule out acquired metabolic causes of dementia.

2. Neuroimaging

A plain and contrast-enhanced CT scan of the head is sufficient in most cases to visualize tumors.

3. Cerebrospinal Fluid Examination

CSF examination through a lumbar puncture is presently not mandatory but useful in detecting convert but reversible causes of dementia such as chronic neuroinfections. Medications used in modern science in Alzheimer related problems are, acetylcholinesterase inhibitors and NMDA (N-methyl-D-aspartate) receptor antagonist.^[14,15]

Some texts explain the herbs which can be used for nervous system disorders.

MATERIALS AND METHODS

The article is based on a review of Ayurvedic texts. Materials related to concept of Alzheimer's disease, and other relevant topics have been collected. For Ayurvedic and modern concepts of Alzheimer's disease reference have been taken from textbooks, various websites, electronic media and articles.

Herbs in Alzheimer's disease

Ashwagandha (Withania somnifera)

Ashwagandha is used tonic for nervous system.^[16] It performs antioxidant activity. *Ashwagandha* plays important role in stress so can be used in the patients of Alzheimer's disease.^[17] *Ashwagandha* increases memory and ability of learning.^[18] It also increases the cholinergic activity. As per recent research *Ashwagandha* has an ability to stimulate nervous system.^[19]

Haridra (Curcuma longa)

Usually *Haridra* is used in cooking as spice in Asia. *Haridra* has active components such as tumerone oil and water soluble curcuminoids.^[20] Curcumin has antioxidant and anti-inflammatory properties.^[21] *Haridra* helps to balance cholesterol levels, fight against allergens and to boost immunity.^[22] In recent studies, oral supplementation of curcumin in dose of 4gm/day was found safe.^[23]

Brahmi (Bacopa monnieri)

Brahmi is used as tonic for nervous system, tonic for cardiac system and also in diseases such as epilepsy, asthma.^[23,24] The major constituent of *Brahmi* is saponins and triterpenoid saponins.^[24-26] *Brahmi* can prove the memory restorative agent in the treatment of Alzheimer's and dementia.^[27]

Guduchi (Tinospora cordifolia)

Guduchi plays important mechanism for immunostimulation. Also has property of memory enhancing and also helps in the synthesis of acetylcholine.^[28] Thus contributing in increased choline level which shows that it has memory enhancing property.

Shankpushpi (Convovulu spluricaulis)

Plant of *Shankpushpi* is commonly found in India and is used tonic for nervous system.^[29,30,31] *Shankpushpi* regulated adrenaline and cortisol.^[32] It might be used in stress, anxiety, mental fatigue and insomnia.^[23,33,34]

Jyotishmati (Celastrus paniculatus)

Jyotishmati is used for sharpening the memory and to increase concentration.^[35] It has an antioxidant properties. The extract of seed have cholinergic activity.^[36]

Guggulu

Guggulu contains ferulic acids, phenols and other non-phenolic aromatic acids which are helpful in the treatment of Alzheimer's disease.^[37,38] It is also used in the treatment of arthritis, inflammation and obesity.

Satapatrika (*Rosmarinus officinalis*)

It contains apigenin, carvacrol, eugenol, oleanolic acid, thymol and ursolic acid which are COX-2 inhibitors.^[39] In addition, *Satapatrika* also have antioxidant, cytoprotective, anti-apoptotic and anti-inflammatory properties.

Yashtimadhu (*Glycyrrhiza glabra*)

Causative agent of Alzheimer's disease is A β . In a recent study it was found that water extract of *Yashtimadhu* helps to prevent brain cell death.^[40]

Useful Kalpa's in Alzheimer's disease^[41]

- a) *Aampachakvati*
- b) *Vatagajankush rasa*
- c) *Dashmoolarishta*
- d) *Triphala Guggulu*
- e) *Chandraprabhavati*

Drugs which help in learning and memory

All *Rasayana oushadhas* does not have common *rasa* (taste), *Veerya* (potency) or *Guna* (qualities) but all are *Deepana* (appetizers) and *Srotosodhana* (cleans the channels). Normal functioning of *Srotas* (channels) depends on healthy *Dhatu*s (tissues). *Srotosoushtava* (normalcy of *Dhatu*s) is highly essential to convey the nutrients to each and every cell. *Shodhana* (purificatory) therapy acts at the level of *Doshas* (humours) but *Rasayana* drugs acts still deeper that is at the level of *Dhatu*s (tissues). Hence in deep seated disease where severe vitiation of *Dhatu*s (tissues) occurs such as Alzheimer's disease, *Rasayana chikitsa* is the regimen of choice.^[42]

Yoga and Meditation^[43, 44, 45, 46]

Yoga and meditation may play role in improving symptoms of Alzheimer's disease. Performing to this brain forms new connections and recover from the injuries which had in the disease. Patients doing to this may find peace and feel happier.

Kirtan Kriya which is explained in meditation, has following benefits:

- ✓ Reverses memory loss
- ✓ Improves sleep quality
- ✓ Increases energy levels
- ✓ Down regulates inflammatory genes
- ✓ Improves psychological and spiritual well being
- ✓ Activates significant anatomical areas of the brain

How to perform Kirtan Kriya?^[43]**a) Posture:**

Sit straight in a chair or any other with your feet flat on the floor.

b) Breath

Breathe naturally

c) Eyes

Eyes shall be kept closed

d) The Chant

Saa, Taa, Naa, Maa are the sounds in the chant. These mean "my true identity" or "my highest self."

e) Finger Movements

The thumb is touched to each of the other four fingers in sequence. Both hands perform the same movement set simultaneously.

On *Saa*, touch the index fingers of each hand to the thumbs.

On *Taa*, touch your middle fingers to your thumbs.

On *Naa*, touch your ring fingers to your thumbs.

On *Maa*, touch your little fingers to your thumbs.

Always go forward in sequence, never go backwards.

f) The Sequence

Sounds shall be sung *Saa Taa Naa Maa* while performing the finger movements of both hands. At the same time, visualize the sound flowing in through the top of your head and out the middle of your forehead.

1. For two minutes, sing out loud.
2. For the next two minutes, use a stage whisper.
3. For the next four minutes, say the sound silently to yourself.
4. Then whisper the sounds for two minutes and then out loud for two minutes, for a total of twelve minutes.

To come out of the exercise, inhale very deeply, stretch your hands above your head, and then bring them down slowly in a sweeping motion as you exhale.

CONCLUSION

Alzheimer's disease is a disease which is going to be affect a patient for a long time. As the medications for Alzheimer's disease are approved by the greater authorities but their adverse effects in the body may lead to anxiety in the patient. Yoga and meditation can also be done for Alzheimer's disease which can help to reverse the memory loss. The herbs mentioned in this article have various properties such as antioxidant, anti-inflammatory, etc. which can be used for long duration either with modern medications as a supplements or as an individual. *Rasayana* therapy has been explained in Ayurveda which have adaptogenic, Immuno-modulatory action, neutraceutical action. Herbs mentioned in this article are helpful in treating

Alzheimer's disease but further research is required to prove their effectiveness in Alzheimer's disease.

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