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Case Study

AYURVEDIC MANAGEMENT OF ALZHEIMER'S DEMENTIA WITH DEPRESSIVE SYMPTOMS - A CASE STUDY

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ABSTRACT

Dementia is a syndrome due to degeneration of the cerebral cortex, usually of a chronic or progressive nature, in which there is disturbance of multiple higher cortical functions, including memory, thinking, orientation, calculation, comprehension, capacity to learn, language skills and judgment. Alzheimer's dementia, Frontotemporal dementia, dementia with lewy bodies, vascular dementia, Huntington's dementia and Parkinson dementia are the types of dementia. Alzheimer's dementia is the most common one among the category. The prevalence of depressive symptoms in dementia is 30% and is presented with symptoms such as poor appetite, sleep perversions and social withdrawal. Features of *Smrti vibhrama* and characteristics of *Pranavrta vyana* are being observed Alzheimer's dementia. There is still no effective cure for dementia in contemporary medicine. So, developing an Ayurvedic protocol to treat dementia is a necessity. This is the case of a 72-year-old male presented with loss of interest in daily activities, fatigue, reduced appetite and increased sleep for duration of 7 months and underwent treatment for 1 month. Diagnosis was done based on the criteria in DSM 5 and the severity was assessed by Mini- mental status Examination and Hamilton's Depression Scale. The management was a combination of modalities including *Deepana, Pacana, Virecana, Nasya* and follow-up of 1 month. The treatment modalities were found to be effective in the cognitive and depressive symptoms as well as improving the social behaviour in dementia patient.

INTRODUCTION

Dementia describes a chronic and progressive clinical syndrome characterized by cognitive impairment (particularly memory loss), inability to perform activities of daily living, neuropsychiatric features, psychiatric symptoms and behavioral disturbances (behavioral and psychological symptoms of dementia BPSD). Dementia is so common in late life with the risk doubling every five years after age 65.[1] This disease manifests as a set of related symptoms.[2] The symptoms involve progressive impairments in memory, thinking, and behavior, which negatively impact a person's ability to function and carry out daily activities. Apart from disturbance in thought patterns and memory impairment, the common symptoms include emotional problems, difficulties with language, and reduced motivation. The symptoms can be labelled as occurring in a range over several stages.[3] Consciousness is often unaffected. Alzheimer's disease (AD) is the prime cause of dementia (60%), followed by vascular dementia (VaD) (20%) (Although 20% of people have both AD and VaD) then dementia with Lewy bodies (DLB) (15%).[4] Dementia ultimately has a significant impact on the individual, caregivers, and on social relationships as well.[3]

Numerous ways are there in which depression and dementia may be linked. First, depressive symptoms often occur among those with dementia. Second, depression can be a response to early cognitive deficits. Third, depression can weaken cognitive function resulting in pseudodementia. Lastly, depression can be a risk factor or initial symptom of dementia. There is a link exist between depression and dementia. Even though depression and dementia are different, they share some features such as impairment in attention and working memory, variations in sleep

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patterns and impaired social and occupational function.[5]

Depression is usually seen in AD, having a prevalence of approximately 20% (prevalence is higher than 20% in VaD and DLB). It may be very hard to diagnose depression precisely in dementia. The patient may not be able to report their symptoms unfailingly due to impairment in memory, insight and comprehension. Therefore, Observations and detailed history are important in doing the diagnosis. Depression symptoms are often present in patients with dementia in the absence of coexistent depression.[6] Hence for better differentiation between dementia and major depression, the diagnostic criteria in DSM 5 is useful.

A diagnosis of dementia requires the observation of a change from a person's usual mental functioning, and a greater cognitive decline than what is caused by normal aging.[7] Diagnosis is usually done in accordance with the history of the illness and cognitive tests also with the help of imaging techniques. Blood tests may be done to rule out other possible causes that may be reversible, such as an underactive thyroid, and to determine the subtype. Mini-Mental State Examination (MMSE) is the most commonly used cognitive test.[8]

There is no known cure for dementia. Acetylcholinesterase inhibitors such as donepezil are often used and may be beneficial in mild to moderate disorder. The overall benefit, however, may be minor.[9] There are many ways that can improve the quality of life of dementia patients and their caregivers. Cognitive as well as behavioral correction approaches can be suitable.

Ayurvedic Perspective

As per the opinion of Acarya Susruta old age is above 70 years[10] whereas according to Acarya Caraka, it is above 60 years.[11] *Vatadosha* is predominant in old age, it causes atrophic involuion of tissues and is responsible for most of the manifestation of aging. As the age advances agni also get depleted which again causes atrophy due to defective metabolism. According to Ayurveda aging is *Swabhavaja Vyadhi*. *Sharangdhara Samhita* has reference addressing the loss of differernt biological factors during different decades of life due to aging.[12] In Ayurveda the impaired memory is seen in *Smrthi vibhrama*[13] and the behavioral changes in dementia is comparable with features of *Praanaavrta vyana*.[14]

The aim of the treatment approach should be to prevent the further brain degeneration and revert back the normal daily functioning. In this case, the *Dosha* predominance is predominantly *Kapha* associated with *Vata*. The treatment approach should include initial *Deepana, Pacana, Shodana, Samana* and *Rasayana.* Medicines which are having *Medhya* property are essential.

Case History

72 years old male presented in the OPD complaining loss of interest in daily activities, fatigue, reduced appetite and increased sleep for last 7 months and according to informant he was having increased sleep, less intake of food, reduced mingling with others and increased doubts. Patient is the second child of non-consanguineous parents, an introvert from childhood onwards. He stopped his education at 9th standard. After that he went to different states of India for work and started to work in a nuclear fuel complex (NFC, Hyderabad) in 1970. He got married at 28 years of age to a lady; she was very hostile in nature and never allowed him to take any decision of his own. He was very sincere towards his works and spent a lot of time for his work than spending with his family this again irritated his wife. After the birth of 2 children her irritating nature got aggravated. She used to blame the patient for small mistakes and made him to feel that he is worthless.

For the last 10 years his daughter is living with them after separated from her husband. He is thinking that he is solely responsible for his daughter's condition. This made him so sad and feels guilty that he remains restricted inside his home without much social interaction. In between (at 2021) he was diagnosed with jaundice and developed reduced interest in food and preferred to sit alone. Simultaneously he developed a lot of suspicions regarding his home (selling his home without his consent). He was not ready to use the water from the well because he is thinking that a snake is hiding in the well also behavioral modifications like remain awake at night and not allowing others to sleep. His son made him to visit a psychiatrist nearby and was diagnosed with dementia in December 2021 and started medication. But he didn't get much relief. So, they consulted here for better treatment.

Table 1: Mental status examination

General appearance	Lean, well dressed
Psychomotor behavior	Reduced
Attitude towards examiner	Co-operative
Mood	Sad
Affect	Anxious

Speech	Poverty of speech, low pitch
Thought	Form/process- Continuous Content- Delusion of reference, delusion of persecution, helplessness, hopelessness and worthlessness
Insight	Grade 1
Judgment	Slightly impaired

Pulse rate was 68/min and regular; Blood Pressure was 120/76 mmHg, temperature was 97.6°F and respiratory rate was 16/min. BMI was 19.4 with height 182cm and weight 65kg.

- Respiratory system- Normal vesicular breathing, no added sounds. No abnormality detected.
- Cardio vascular system- No murmurs, S1, S1 and S2 clearly heard. Integumentary system- No abnormalities were detected.
- Digestive system was found to be unaffected.
- Nervous system, higher mental functions like attention and concentration were slightly impaired, abstract thinking was impaired and the dimensions of speech like intensity and speed were reduced

Prakrti of the patient was *Vatapitta. Dosha* vitiation was *Tridoshapradana kaphadushti* with *Vata* predominance. *Satwa* (psyche), *Sara* (excellence of tissues), *Samhanana* (compactness of organs), *Aharasakthi* (digestive power), *Vyayamasakthi* (capacity of exercise), *Satmya* (suitability) and *Pramana* (body proportion) of the patient were of *Avara* level.

Manovahasrotas (channels that transfer mental process), *Rasavahasrotas* (channels that carries nutrition) - *Aruci, Tantra*, *Kkrsaangatha* and *Majjavaha srotas* were involved in the current manifestation.

Table 2: Internal medicines

Medicine	**Dose**	***Anupana***	***Oushada kala***	**Rationale**
Vara vishaladi Kashaya[15]	15ml	45ml lukewarm water	2 times a day before food	*Medhya*, corrects the behavioral changes
Kanmada bhasma[16] capsule	2 no.s		At bed time after food	To prevent further progress of dementia
Brhat vaiswanara choorna[17]	1tspn	with ¼ glass lukewarm water	2 times a day before food	*Deepana, Pacana*
Dasamoola hareetaki[18]	15 gm		At bed time after food	*Vatha kaphahara*

Dhoopana with *haridradi choorna*[19]- Daily once.

Table 3: Treatment Schedule

Treatment	**Medicine with dose and duration**	**Rationale**	**Observations**
Virecana	*Sukumara eranda*[20] 20ml with lukewarm water	*Vatanulomana* *Indriyaprasada* *Buddhiprasada*	Felt lightness of body
Takrapana	1 litre *Takra* + 10gm *Hinguvacadi choorna*[21] for days	*Kaphavata samana, Rookshana*	No changes reported
Snehapana	*Mahatpanchagavya ghrita*[22]- 30ml	*Dosha uthkleshana, Snehana*	Vomited the entire *Ghrita* because he couldn't tolerate
Marsa nasya	*Vilwadi gutika*[23] *Kalka* -1ml starting dose (upto 5 days) 2ml (6th and 7th day)	*Uthamanga -shodhana* Provide *Dridendriyathwa* and *Apalithya*	Food intake and appetite improved Memory improved Motor activity better
Sirodhara	*Kwatha* of *Dasamoola, Bala* and *Pancagandha choorna*	*Srothoshodhana* *Rookshana*	No changes reported

Yoga vasthi *Matravasthi* *Pippalyadi anuvasana tailam*[24] (100ml) - 4 days *Mahatpanchagavya ghrita*-1 day *Kashaya vasthi* *Erandamooladi kashaya vasthi (Taila- Danwanthara mezhukupaka)*-3 days		*Vatasamana* *Medhakrt* *Buddhindriya-Samprasada*	Social mingling improved delusion of reference & delusion of persecution changed to ideations only
Pratimarsanasya	7 days –*Mahatpancagavya ghrita* (5 drops)	To alleviate the behavioral changes and improve cognitive functions	Memory improved Fatigue reduced
Takradhara	7 days – with *Dasamoola* and *Triphala kwatha*	To reduce the *Kaphaja* symptoms. For stimulation of brain and to bring out normal dopaminergic activity.	Vertigo after first day of *Takradhara,* sleeping hours increased Sleep quality improved Sad mood changed to euthymic
Hareethakyadi shodhana[25]	*Haritaki, Amalaka, Saindhava, Nagara, Guda, Vidanga, Rajani Pippali* (2gm each) *Vaca* (1gm)	To increase bio-availability of *Rasayana*	Appetite improved
Rasayana	*Gudaardraka*[26] (*Guda*- 10gm+*Ardraka Swarasa*- 10ml)- 1st & 2nd day (*Guda*- 20ml + *Ardraka swarasa*- 20ml) – 3rd day	Pacify *Kaphaja* symptoms	Social mingling improved
Talapothichil	3 days with *Jatamamsi, Yashti, Amalaki, Mustha, Aswagandha, Sarpagandha, Guduchi* (equal quantity)	To improve the cognitive functions	Waking hours during day increased Memory improved

Table 4: Internal medicines (at the time of discharge)

Medicine	**Dose**	***Anupana & Oushadakala***	**Rationale**
Swetha sankapushpi + Vaca choorna	5gm+1gm increased by 3gm up to 15days	Lukewarm water, morning and evening	*Smrti pradha*[27]
Drakshadi kwatha	15ml	45 ml Lukewarm water, morning and evening	Excellent antioxidant properties[28]
Smrtisagara rasa	1 no.s	*Drakshadi kwatha,* morning and evening	Improve sensory and motor function-*Kaphagna, Samjnasthapaka, Smrtivardaka, Masthishka dourbalya hara*[29]
Manasamithra vataka	1 no.s	Lukewarm water, morning and evening	Increases *Medha*, nootropic[30]
Rasnadasamooladi taila for head	Sufficient		*Vata samana*

Table 5: Assessment scales

	BT	**13/4/22**	**21/4/22**	**AT**	**After follow-up**
HAM D	23	20	19	16	14
MMSE	20	20	28	28	28

DISCUSSION

Since the *Dosha* involvement is *Kapha* with associated *Vata*, treatments were aimed to mitigate this *Doshas* along with *Medhya* drugs to prevent further brain degeneration and which helps to regain back the neuronal health were adopted. Initial *Deepana Pacana* is essential. *Brhatvaiswanara choorna* and *Dasamoolahareetaki lehya* was administered for this purpose [table 2]. A formulation which is having *Medhya* property as well as one which corrects the behavioral changes was thought to be useful, so, *Varavishaladi kwatha* which is an anti-depressant, anxiolytic and anti-psychotic agent[31] was selected [table 2]. In order to make the degeneration of cortex slower and hence by preventing further progress of dementia, *Kanmada bhasma* which minimize free radical induced damage and reduces the brain changes due to aging was administered [table 2].

As *Smrti bramsha* occurs in dementia and result in impairment of *Buddhi*. This can be managed by *Rasayana* drugs especially *Medhya Rasayana*. *Medhya Rasayana* drugs work on the hypothalamus-adrenal axis (HPA axis) and normalize the secretion of neurotransmitters such as dopamine, serotonin, and acetylcholine and thus can improve the mental functions.[32]

Furthermore, before *Rasayana* therapy, *Shodhana* is a prerequisite. Though *Sodhana* is a prerequisite before *Rasayana* treatment, but in dementia due to old age and consequent *Dhatu kshaya*, *Mridu*, and *Snehayukta Sodhana* such as *Mridu Virechana* in the form of *Sukumara eranda* was adopted [table 3]. *Takra* is *Kaphavata hara* and *Rooksha* in nature, so it can be adopted internally for *Deepana* and *Pacana*. After this *Mahatpancagavya ghrita* was selected for *Shodananga Snehapana* due to its *Teekshna* property, but the patient couldn't tolerate it and vomited the entire *Ghrita* [table 3].

While considering the *Sthanika Dosha* which is *Prana Vata* and *Tarpaka Kapha* - *Nasya* is beneficial. *Nasya* is also beneficial for delivering the therapeutic agents into the central nervous system (CNS). *Vilwadi gutika* as *Swarasa* was selected for this purpose because of its *Teekshna* nature, *Nasya* with *Teekshna* drugs or like *Vilwadi Gulika* as the principal *Dosha* is *Kapha*[33] [table 3]. Since *Kashaya dhara* is *Srtothoshodhana* and *Rooksha* in nature which is adopted as *Sirodhara* using appropriate drug combination [table 3]. As *Vasti* is the ultimate *Chikitsa* for *Vata Dosha*, *Yogavasthi* was selected to pacify the remaining *Vata Dosha.*

Pratimarsa nasya with *Mahatpancagavya grta* [table 3] which is indicated in *Kaphaja Unmada* was selected to alleviate the behavioural changes associated with dementia. As discussed earlier, *Rasayana* was done using *Gudaardraka* which is effective in *Agnimandhya* and *Aruci* also due to its *Teekshna* nature, it alleviates the other *Kaphaja* symptoms also [table 3]. It clears the channels of mind with its potency and sharpness, kindles the *Agni* and improves the digestion resulting in an ideal formation of *Rasa Dathu*. Consequently, the *Ojus* and its abode mind also get purified. In modern point of view-the constituents of ginger have exhibited it's capability in balancing the neurotransmitters in brain that are related with depression.[34]

Sirolepa was done with *Jatamamsi, Yashti, Amalaki, Mustha, Aswagandha, Sarpagandha and Guduchi*.[35] As the AD affects cognitive functions also, *Medhya* drugs were added along with *Amalaka* [table 3]. The medicines during follow up period were aim to reestablish the *Smrti,* vegetative functions, activities of daily living and normal social behaviour also to prevent further deterioration. After follow up, In HAM D, significant changes were observed in mood, sleep, work and interests, social mingling and appetite. Changes were observed in all domains in MMSE [table 5].

CONCLUSION

AD is progressive degeneration of brain with changes in behavioral and cognitive levels. Both these aspects are distressing to the caregivers rather than the patients. Associated depressive symptoms in AD make the patient incapable to continue with his daily activities and further progression leads to drastic behavioral changes also. So, timely and appropriate management is necessary. The present case study of AD treated with Ayurvedic medications and therapies yielded changes in depressive and cognitive symptoms associated with AD thereby helped the patient to improve his day-to-day functioning. There is further scope in the field of Ayurveda in managing such conditions as well as in providing better outcome both in the health status of the affected as well as their caretakers.

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