ROLE OF *MEDHYA RASAYANA* IN THE MANAGEMENT OF DEMENTIA OF THE ALZHEIMER'S TYPE

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ABSTRACT

Introduction: Dementia of Alzheimer's type (DAT) is a progressive inevitable loss of cognitive function associated with the manifestation of senile plaques in the hippocampal area of the brain. It is most common form of dementia among middle age and older adults which accounts for 60-80 percent of dementia cases. The pathogenesis of DAT can be multifactorial; disturbance in *Tridosha, Triguna; Jarajanya Smritirhas* with *Vataprakopa; Akalaja Vyadhi; Aama* in terms of protein aggregation. So treatment modality ought to act on this pathogenesis. **Material and Methods:** Eleven cases of DAT diagnosed as per DSM IV were given *Medhya Rasayana Churna*. The outcomes were assessed by Changes in Clinical Dementia Rating (CDR) Scale and Cornell Brown Scale for Quality of Life in Dementia (CBS-QLD). Ethical clearance was obtained (PIA/IECHR/2016-17/KC/009) and this study is registered in Clinical Trial Registry of India (CTRI/2017/05/008563). **Result:** Severity of DAT as assessed by CDR scale showed improvements in Orientation (57.48%), Judgment and problem solving (57.63%), Community affairs (43.16%), Home and hobbies (67.07%), which were statistically highly significant. Effect of *Medhya Rasayana Churna* was statistically highly significant in quality of life in Dementia (58.13%) as assessed by CBS. **Discussion:** The effect of MRC in DAT may be due to *Medhya*, *Srotoshodhana*, anti-oxidant, stimulant, neuroprotective property which helps to prevent and reverse the pathogenesis. **Conclusion:** The alternate hypothesis-*Medhya Rasayana* is effective in the management of Dementia of the Alzheimer's type, is accepted and null hypothesis stands rejected.

Keywords: Dementia of Alzheimer's type, *Smriti*, *Medhya Rasayana*, Ayurveda.

INTRODUCTION

Dementia of Alzheimer's type is a progressive inevitable loss of cognitive function associated with the manifestation of senile plaques in the hippocampal area of the brain. It is most common form of dementia among middle age group as well as older age group which accounts for 60-80 percent of dementia cases.[1] It can only be diagnosed with inevitability by postmortem demonstration of abundant neurofibrillary tangles and neuritic plaques with associated accumulation of amyloid precursor protein, amyloid-β

(APP-Aβ) deposits in plaques and vessel walls in selected regions of the brain. Symptoms appear mostly after the age 60 years, and some early onset also seen due to early ageing. Initial symptoms are short term memory loss, failure to learn new information, mood swings, difficulty in framing words, forgetting name and emotional disturbances like irritability, frustration. In severe stage patients become totally incontinent, complete memory loss, disorientation of time, place, and person, complete dependency on others.[2] Thus DAT presents substantial problem in the management. So far, efforts to find a cure for DAT have been disappointing, and currently available drugs have only symptomatic relief but long term use is hazardous. To alter the current situations, need to search the alternative effective therapy, which will correct the present condition and also retard the progression of the disease by preventing the formation or clearing of plaques.

Recently there is tremendous urge to explore medicinal plants globally for improving cognitive function owing to their less adverse effects. People are approaching Ayurvedic clinicians most of the time. So, now it became important to find management of DAT through Ayurveda.

Medhya Rasayana is a special class of *Rasayana dravyas* which is supposed to have specific influence on various brain functions like endows with good memory.

Objective:
To evaluate the effect of *Medhya Rasayana* in the management of Dementia of the Alzheimer's type.

Material and Methods:
Ethical clearance was obtained (PIA/IECHR/2016-17/KC/009) and this study is registered in Clinical Trial Registry of India (CTRI/2017/05/008563)
Study Design: Open clinical study
Settings:
Total 12 patients of Diagnosed cases of Dementia of the Alzheimer's type were selected from Out-patient department of Kayachikitsa, Parul Ayurved Hospital,

Parul University and referred cases from other departments/ physicians of the city. Patients of Age group of above 50yrs and below 80yrs irrespective of sex, Religion, Socio-economic Status.

Diagnostic Criteria:
Alzheimer's type (mild and moderate) as diagnosed based on DSM-IV-TR.[3]

Exclusion Criteria:
- Patients who are completely dependent on others for daily activities
- Cerebrovascular disease, Parkinson's disease, Huntington's disease, subdural hematoma, normal pressure hydrocephalus, brain tumor.
- Hypothyroidism, vitamin B12 or folic acid deficiency, niacin deficiency, hypocalcaemia, neurosyphilis, HIV infection
- Substance induced conditions.

Criteria for Assessment:
- Changes in Clinical Dementia Rating (CDR) Scale and
- Cornell brown scale (CBS) for Quality of life in dementia.

Time points:
The outcomes were measured after screening at Baseline (BT) and at the end of 12 weeks (AT).

Interventions:
The trial drug chosen for the present study- an herbal preparation- *Medhya Rasayana Churna* (MRC) which containing- *Mandukaparni, Guduchi, Shankhapushpi* and *Yashtimadhu*- in equal quantity. 5gm churna twice a daily after food with *Madhu* and *Ghrita* in unequal quantity was given for 12 weeks.

Observations:
A total of 12 subjects were registered for the clinical trial. Among them 11 (91.67%) completed the schedule and 1 was dropped without citing any specific reason for doing so. The data was analyzed sta-

tistically using the subjects who completed the pro-tocol.

Maximum number of subjects (45.45%) belonged to 61-70 years of age. Majority of the included subjects were males (63.63%). Majority was Hindu (90.90%), married (72.72%), educated up to high school (36.36%), of middle income group (81.81%) and retired from Job (45.45%).

Table 1: Distribution of Patients based on Clinical features

Memory decline related Clinical features	No. of Patients	%
Interferes in Daily activity	11	100
Able to work independently	7	63.63
Learning affected	11	100
Where the belongings	11	100
Social Arrangements	7	63.63
Recent information by Family Members	6	56.56
Serious Handicap to independent living	0	0
Highly learned & very familiar is retained	4	36.36
New information retained – Occasionally	4	63.63
Unable to recall basic information	0	0
Geography	0	0
Complete inability – New Inform	0	0
Only fragments remains	0	0
Fail to recognize close relative	0	0
Other cognitive decline related Features	**No. of patients**	**%**
Interfere with daily activity	11	100
Able to carry work independently	7	63.63
Complicated tasks cannot be done	6	56.56
Unable to function without assistance	6	56.56
simple chores can be performed	3	27.27
Activities – Restricted Poorly sustained	5	45.45
Absence of Intelligible ideation	0	0
Reduce in flow of Idea & reasoning	7	63.63
Awareness of Environment preserved	11	100

Maximum patients had the complaints since 2.6-5 years (63.63%).

Effect of therapy:

Table 2: Effect of therapy on Clinical Dementia Rating (CDR) scale

CDR Scale	Mean BT	AT	%	Mean	SD	SE	T	P
Memory	1.09	0.77	29.35	0.32	0.34	0.010	3.130	0.011
Orientation	1.27	0.54	57.48	0.73	0.26	0.079	9.238	<0.001
Judgment & Problem Solving	1.18	0.50	57.63	0.68	0.25	0.076	8.964	<0.001
Community affairs	1.95	0.54	43.16	0.41	0.02	0.061	6.708	<0.001
Home & Hobbies	0.82	0.27	67.07	0.54	0.15	0.04	12.000	<0.001
Personal Care	0.45	0.00	100	0.45	0.52	0.16	2.887	0.01
Total Effect of CDR Scale	1.00	0.41	59	0.59	0.20	0.16	9.690	<0.001

Table 3: Effect of therapy on Cornell-Brown Scale for Quality of Life in Dementia

CBS-QLD Scale	Mean		%	Mean	SD	SE	T	P
	BT	AT						
Mood related signs	-5.45	5.1	63.75	-10.55	1.13	0.34	-31.00	<0.001
Ideational disturbances	-2.73	4.36	54.5	-7.09	0.30	0.10	-78.000	<0.001
Behavioral disturbances	-4.00	4.64	58	-8.64	1.80	0.54	-15.877	<0.001
Physical Signs	-3.18	3.91	65.17	-7.09	2.12	0.64	-11.098	<0.001
Cyclic functions	-3.55	4.09	51.12	-7.64	0.67	0.20	-37.566	<0.001
Total effect	-18.91	22.09	58.13	-41.00	5.06	1.53	-28.876	<0.001

DISCUSSION

There is no equivalent explanation of DAT in Traditional Science. In Ayurveda learning or acquisition of knowledge is a result of successive and complex interaction with coordination of *Atma, Indriyas* (cognitive organs), *Mana* (psyche) and *Indriyartha* (sense organs).[4] Therefore disturbance in any function leads to impairment of cognitive function.

The functioning of these factors is maintained by *Tridosha* (*Vata, Pitta* and *Kapha*) and *Triguna* (*Satwa, Raja* and *Tama)* in a specific coordination and balance.[5]

The pathogenesis of DAT can be multifactorial; disturbance in *Tridosha, Triguna*[6]; *Jarajanya smritirhas* with *Vata Prakopa; Akalaja Vyadhi; Ama* in terms of protein aggregation. So treatment modality ought to act on this pathogenesis.

In a nutshell symptoms of DAT can be correlated with the vitiated *Prana, Udana, Vyana Vata, Sadhaka Pitta, Avalambaka* and *Tarpaka kapha, Rajas* and *Tama doshas* which are involved. So treatment modality should act on this *doshas*.

Medhya Rasayana is the group of medicines which have numerous benefits especially it improves the memory and intellect by its *Prabhava*. *Grahana Shakti* (power of acquisition), *Dharana Shakti* (power of retention) and *Smriti* (power of recollection) all three are included in *Medha. Medhya* property is *Prabhava Janyakarma.* These drugs act at level of *Rasa* to stimulate the function of *Agni* and improve circulation of the *rasa* by opening and cleansing the *Srotas* leads to improvement in *Medhya* function.

The selected formulation of *Medhya Rasayana Churna* (MRC) is combination of *Mandukaparni, Guduchi, Shankhapushpi* and *Yashtimadhu.* These four drugs are explained as *Medhya Rasayana* by Acharya Charaka, extensively researched and proved as Nootropic herb.

Discussion on effect of therapy:

The *churna* showed excellent efficacy in reducing the severity of 6 cognitive categories of CDR scale.

Mandukaparni (Centella asiatica) has been demonstrated to possess neuro-protective property in AD.[7] It also proven to be capable of increasing intelligence, longevity, and memory[8], to reduce hydrogen peroxide-induced cell death, decrease free radical concentrations the oxidative stress response.[9]

Yashtimadhu (Glycyrrhiza glabra) is reported to treat or even prevent brain cell death in disease like Alzheimer's and its associated symptoms.[10]

Guduchi's *(Tinospora cordifolia)* mechanism for cognitive enhancement is by immuno-stimulation and synthesis of acetylcholine has proved in study.[11]

Shankhpushpi (Convolvulus pleuricaulis) possess Nootropic and memory-enhancing properties which has been proven in research.[12]

MRC markedly improved all domains and subjective feeling of quality of life in CBS which was statistically highly significant.

In mood related signs improved due to mood elevating effect,[13] antioxidant property[14] of the drug used. Trial drug possess stimulant activity,[15] antidepressant[16] which improved ideational disturbance. Improvement in Behavioral disturbance brought by the

antianxiety,[17] learning and memory enhancing,[18] antioxidant,[19] anti-stress action,[20] neuro-protective[21] activity of MRC. Features included in physical sign were gradually improved due to stimulant[22] and appetizing property[23] of trial drug. Gradual improvement was seen in cyclic functions due to the sedative[24] and tranquilizing activity[25] of trial drug.

CONCLUSION

Medhya Rasayana Churna (MRC) exerted better improvements in outcome measures in DAT.

Due to brain growth promoter, anti-seizure activities, neuro-protective and free radical scavenger (Antioxidant) properties, it helped for subsiding neuro-degenerative changes that occur with DAT and also accelerated repair of damaged neurons. Due to neuro-protective, antioxidant, adaptogenic property better recollection occurs by improving Sensory and Declarative memory. It is also evident that the drug improves quality of life to a remarkable extent.

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Source of Support: Nil
Conflict Of Interest: None Declared