



Research Article

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RESPONSE OF *CENTELLA ASIATICA* IN THE MANAGEMENT OF AGE RELATED PROBLEMS AMONG ELDERLY WITH SPECIAL REFERENCE TO COGNITIVE PROBLEMS AS PER PRAKRITI

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ABSTRACT

Centella asiatica causes an overall decrease in the yield of central monoamines, implicating the participation of nor epinephrine, dopamine and 5-HT in learning and memory process towards long term retention of information. More recently, a new study showed that components in *Centella asiatica* have potential for treating Alzheimer's disease and cognitive impairment. The study was designed to assess the effect of *Centella asiatica* on age related common health problems as per constitution of individuals. Patients aged 60 years and above were enrolled from geriatric O.P.D. Mini Mental State Examination (MMSE) is the most important diagnostic tool for our study along with the history of patients. Present study has showed that significant decrease in MMSE, blood pressure and sleeping disorders was observed in Vata and Pitta Prakriti individuals. In this study drug *Centella asiatica* was found to be highly effective in Mild cognitive impairment by improving the MMSE, Hypertension and sleeping pattern in elderly population.

Key words: Prakriti, MMSE, Cognitive impairment, *Centella asiatica*

INTRODUCTION

Aging is multifaceted and varied process that varies how it affects different people and even different organs. Cognitive impairment is a broad term to describe a wide variety of impaired brain function relating to ability to think, concentrate, react to emotions, formulate ideas, problem work out, reason and remember. *Centella asiatica* is a healing drug of great potency and capable of rejuvenating the system thus enabling to live for ages and improves the mild cognitive impairment along with age related problems. *Centella asiatica* has been considered as a panacea drug, it is said to possess remarkable power in increasing intelligence. It is a perennial, herbaceous creeper growing up to 30 cm in height with fan shaped leaves.¹ The major constituents are triterpene saponins, mainly asiaticoside, sapogenin asiatic acid, madecassoside and madecassic acid. The aqueous extract of *Centella asiatica* possesses antioxidant, cognitive enhancing and antiepileptic properties. Some earlier findings by Sushma Tiwari et.al 2008 have suggested that it is a very potential drug in management of cognitive impairment.² Memory loss has long been recognized as a common accompaniment of aging. The inability to recall the name of a recent social contact over the last few decades, the medical community has changed its view of memory loss in the elderly. These problems were viewed in the past as inevitable accompaniments of aging. If a person is being overcome with rajas and tamas, this is known as the impairment of memory. Normal memory restrains everything memorable.³ Old age and death are to be considered as natural ones, and natural manifestations are irremediable.⁴ Dosages of drugs among old persons should be similar to the dose of childhood. Mandukaparni

swaras rasayan yoga should be given first for 3 days during fast, thereafter taking food of milk and ghee, or its lump in the dose of 1 pala may be used with milk. Thus by using it for 12 days one attains excellent intellect and life span of 100 years.⁵ Prakriti is sum total of morphological, physiological and psychological traits in human beings. Prakriti of a man has genetic and acquired aspect, the genetic aspect depends upon shukra and shonita.⁶ (S.Sha.4/36), while acquired constitution develops in relation to environmental factors like climate, season, time factor, age, race, familial inheritance.⁷ (C.S.In.1/5). Due to these factors, seven kinds of Prakriti have been stated to arise viz.(1) Vata Prakriti(2) Pitta Prakriti (3) Kapha Prakriti(4) Vata Pittaja (5) Vata-Kaphaja (6) Pitta-Kaphaja (7) Sama Prakriti. Qualitative and quantitative, unchangeable doshika predominance from birth to death is called as Prakriti. Prakriti is a deciding factor during prognosis and treatment of diseases. Vata Prakriti individuals are very prone to all kinds of diseases, owing to this it is the most dreadful among all. Prakriti of human being is decided in intra uterine life according to predominance of Dosha and can never be changed throughout life.⁸

Nervous Aging

Although normal changes occur with age in the brain and nervous system, many people have misconceptions about the nature and extent of these changes. Most of the people blame increased confusion on "getting old" when it may, in fact, be caused by an illness.⁹ As people age, nerve cell mass is lost. This causes atrophy of the brain and spinal cord. Brain weight may decrease significantly from the maximum weight of young adulthood. Some nerve cells

lose their coating in a progression called demyelination. These changes slow the speed of message transmission. Waste products from atrophied nerve cells may collect in the brain tissue causing plaques and tangles. Some people have many physical changes in their nerves and brain tissues. A few individuals will have brain atrophy and plaques while some will have plaques and tangles. Although certain changes are typical of specific brain disorders, the amount and type of physical changes is not always clearly related to changes in brain function.¹⁰

Cognitive aging is vital part of aging

Cognitive impairment is a general term to describe a wide variety of impaired brain function related to ability, to think, concentrate, react to emotions, formulate ideas, problem solve, reason and remember. There can be a wide range of severity in impairment from mild to severe. Cognitive impairment can be linked with many disabilities and disorders that can be present at birth or acquired later in life, for example acquired brain injury, autism spectrum disorder, intellectual disabilities, organic dementia, other neurological conditions, other psychiatric and mental health, specific learning disorder and substance dependencies.¹¹

MATERIAL AND METHODS

In this work, an effort has been made to study the age-related physiological changes and also to validate an Ayurvedic drug, "*Centella asiatica*" in the management of age related problems among elderly and to promote healthy aging. All the patients visiting Geriatric O.P.D., Department of Medicine, in S.S. Hospital and Department of Kriya Sharir aged 60 years and above, during the period of August 2007 to November 2009 were included in this study. The ethical committee meeting was held on 12/12/2006 at 2 pm in IMS, BHU, India (Ref no: Dean/2006-07/890). 25 patients from Geriatric O. P.D. were enrolled with MMSE less than 25. *Centella asiatica* was given in the form of Ghana Satva filled in a capsule in a dose of 500 mg BD.

Inclusion Criteria

Patients aged 60 years and above with mild cognitive impairment (MMSE score 24-26) were included in this study.

History and clinical examination

A detailed history was taken and physical examination was performed.

MMSE

The mini mental state examination (MMSE) was used as a screening test for cognitive impairment which is developed by the Indo-US Cross National Dementia Epidemiology Study. This test was used to assess the effect of drug also. The following normative data was taken as the reference for inclusion of patients under this group.¹²

Interviews from care giver

Information about elderly social or occupational functioning, daily activity and any risk factors was obtained from caregiver.

Prakriti evaluation

Assessment of Prakriti was done by proforma prepared for assessment of Prakriti based on characteristics described in various standard text books of Ayurveda.¹³

Scoring

35 anatomical, physiological and psychological traits have been selected and each trait was given score of one mark. Some traits have been more than one characteristics; one mark was again subdivided among the characteristics for each trait. Total score for each i.e. Vatika, Pittika and Kaphaj Prakriti was thirty five. The score of Vatika, Pittika and Kaphaj traits was expressed in percentage.

Exclusion criteria

- Dementia according to DSM IV criteria
- History of significant hearing or visual impairment and unable to participate in an interview in a meaningful manner.
- History of neurological disorders (stroke, Parkinson's disease, active epilepsy) or psychiatric illnesses (schizophrenia, mental retardation and mania) and significant substance abuse.
- Other secondary causes of dementia including endocrine abnormalities and vitamin deficiencies.
- Individuals who were living alone were also excluded because the history and complaints could not be corroborated with another person.

Mode of drug administration

Patients were administered the capsules of *Centella asiatica* Ghana Satva (500mg) for a total period of six months in a dose of 1 Capsule, BD after meals, with lukewarm water. Initially the drug was given for a period of one month and after a follow up, the drug was given for 6 months. The patients were asked to report adverse effects, if any.

Statistical Analysis

The data of 25 patients were collected, coded and fed into the computer. Analysis was done by using Statistical Package for Social Sciences (SPSS) Software Version 11.5. Data tabulated and appropriate statistical test viz frequency, descriptive mean, paired sample t- test and one way ANOVA were performed in order to draw meaningful inferences.

RESULT

Maximum numbers of patients with Mild Cognitive Impairment (MCI) were having either education of collegiate level or illiterate person which is shown in table 2.

Increase in mean MMSE score was observed after treatment with *Centella asiatica*. On intragroup comparison a statistically highly significant ($t= 16.75$ $p<$

0.01) improvement in mean MMSE scores was observed after treatment. This is evident from table 3.

Statistically significant increase was observed in mean MMSE scoring pattern in patients belonging to Vata and Pitta Prakriti. On inter group comparison of mean M.M.S.E. score, no significant change was observed after treatment by one way ANOVA. (Table 4)

On observing the change in SBP, decrease was observed in mean Systolic Blood Pressure after the treatment with *Centella asiatica* in all patients. On intra group comparison it was found highly significant in Vata and Pitta Prakriti individuals. This is evident from table 5.

On observing the change in DBP, decrease was observed in mean Diastolic Blood Pressure after the treatment with *Centella asiatica*. On intra group comparison it was found

highly significant in Pitta Prakriti only. This is evident from table 6.

On observing respiratory rate, decrease was observed in mean respiratory rate in all Prakriti patients but this decrease was more in Pitta and Kapha Prakriti individuals. But on intragroup comparison no statistically significant change was observed in all Prakriti patients. It means that *Centella asiatica* has no significant change in respiratory rate on either of the Prakriti after treatment. This is evident from table 7.

Statistically significant improvement was observed in mean Sleep pattern in patients belonging to Vata and Pitta Prakriti. But no significant improvement in sleep was observed in Kapha Prakriti individuals as shown in table 8.

Table 1: Relationship of MMSE with age and Status of education

Education	Age													
	18-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	>84
4th grade	22	25	25	23	23	23	23	22	23	22	22	21	20	19
8th grade	27	27	26	26	27	26	27	26	26	26	25	25	25	23
High School	29	29	29	28	28	28	28	28	28	28	27	27	25	26
College	29	29	29	29	29	29	29	29	29	29	28	28	27	27

Table 2: Relationship between the status of Education and MMSE

MMSE	Collegiate	Illiterate	High school	Total
20-26	10	9	6	25

Table 3: Effect of *Centella asiatica* on Mini- Mental State Examination

M.M.S.E.	Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
	25.32±0.63	28.48±0.96	3.16±0.94 t = 16.75, p<0.01

Table 4: Effect of *Centella asiatica* on MMSE in Relation to Prakriti

Prakriti	M.M.S.E Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
Vata (n=14)	25.14±0.66	28.64±1.00	3.5±1.01 t=12.85, p<0.05
Pitta (n= 8)	25.50±0.53	28.12±0.99	2.62±0.74 t=9.98, p<0.05
Kapha (n= 3)	25.67±0.57	28.67±0.57	-
Inter group Comparison One way ANOVA	F=0.79 p>0.05	F=1.39 P>0.05	-

Table 5: Effect of *Centella asiatica* on Systolic Blood Pressure in relation to Prakriti

Prakriti	Systolic Blood Pressure (mm of Hg) Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
Vata (n=14)	139±28.18	126.86±19.24	12.14±11.67 P<0.001
Pitta (n=8)	160±30.45	142.5±26.05	18±9.7 P<0.001
Kapha (n=3)	137.33±14.18	130.67±11.37	6.6±3.05 p>0.05

Table 6: Effect of *Centella asiatica* on Diastolic Blood Pressure in relation to Prakriti

Prakriti	Diastolic Blood Pressure (mm of Hg) Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
Vata (n=14)	84.71±17.67	75±6.06	9.71±17.11 p>0.05
Pitta (n=8)	92±12.96	86±10.95	6±2.13 P<0.01
Kapha (n=3)	80±10	73.33±5.77	6.66±5.77, p>0.05

Table 7: Effect of *Centella asiatica* on Respiratory Rate in relation to Prakriti

Prakriti	Respiratory Rate (per minute) Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
Vata (n=14)	20.85±2.24	20.14±1.51	0.71±2.09 t=1.28, p>0.05
Pitta (n=8)	22.37±1.68	20.87±1.72	1.5±1.30 t=3.24, p>0.05
Kapha (n=3)	21±2	19.67±1.53	1.33±0.57 t=4, p>0.05

Table 8: Effect of *Centella asiatica* on Sleep in Relation to Prakriti

Prakriti	Sleep Mean ± S.D.		Intra group comparison paired t-test
	BT	AT	
Vata (n=14)	1.50±0.52	1.07±0.27	0.43±0.51 t=3.12, p<0.05
Pitta (n= 8)	1.75±0.46	1.12±0.35	0.62±0.52 t=3.42, p<0.05
Kapha (n= 3)	1.67±0.58	1.03±0.58	0.33±0.58 t=1, p>0.05

DISCUSSION

In the current study, maximum number of patients with MCI were from collegiate level. Some earlier findings have recommended that MCI is more among only highly educated individuals¹⁴. Mild Cognitive Impairment (MCI) refers to persons whose memory or other cognitive abilities are not normal, without clinically diagnosed dementia. Hydro alcohol extracts of *Centella asiatica* were tested for in vitro acetyl cholinesterase inhibitory activity. Based on Ellman's method it showed a weak inhibition of acetyl cholinesterase.¹⁵ In our study mean MMSE scoring showed significant improvement after administration of *Centella asiatica* for 6 months in elderly with mild cognitive impairment and other age related problems. This finding indicates that *Centella asiatica* is useful clinically in the patients suffering from MCI and other age related diseases. The mode of action of *Centella asiatica* in this condition is probably due to its cholinergic activity. Our study also confirms the finding of earlier workers.¹⁶ A recent study done by Rao KG et al¹⁷ proved that fresh leaf juice of *Centella asiatica* causes enhancement of amygdaloid neuronal dendritic arborization during growth spurt period in rats. It is clear from table 3 that there is statistically significant increase in mean MMSE scoring pattern in Vata and Pitta Prakriti. On the other hand inter group comparison of mean MMSE score did not show significant change before and after treatment by one way ANOVA. One factor for this finding is that the patients with Vata and Pitta Prakriti may be more sensitive for this drug as far as its action on cognitive functioning is concerned and Vata is quick initiator for any kind of stimuli and the other reason may be that the Madhur Vipaka of this drug is both Vata and Pitta shamaka. Incandela L et al. 1979 revealed that TTFCA (Total triterpenic fraction of *Centella asiatica*) displays a significant activity on venous hypertensive microangiopathy up to 120 mg drug daily and may be safely used in venous hypertension.¹⁸ It has been reported in study done by Sushma et al 2010 that there was statistically significant decrease in mean Systolic and Diastolic Blood Pressure.¹⁹ When this effect was assessed in terms of Prakriti statistically significant improvement in SBP was observed in Vata and Pitta Prakriti individuals whereas significant improvement in DBP was observed in Pitta Prakriti patients after the treatment with *Centella asiatica*. Irrespective of Prakriti in all the individuals statistically highly significant improvement was observed in SBP while significant improvement in DBP. (Table 5, 6) This finding confirms the finding of earlier workers.¹⁶ *Centella asiatica* has no significant change in respiratory rate on either of the Prakriti after treatment. This is evident from table 7. The drug has a potential tranquilizing effect which has been proposed by earlier studies also.²⁰ When the effect of drug was assessed on sleep as per Prakriti, Vata and Pitta Prakriti individuals responded well to *Centella asiatica* which is evident from table 8 which shows that there was statistically significant improvement in sleep pattern in Vata and Pitta Prakriti patients after the treatment with *Centella asiatica*. The effects on sleep may be due to tranquilizing effect of *Centella asiatica*.

CONCLUSION

The aim of this study was to assess the effect of *Centella asiatica* in cognitive impairment as well as age related common day to day problems among elderly population, In Vata and Pitta Prakriti patients, statistically significant increase in mean MMSE scoring was found. A statistically highly significant decrease in mean Systolic BP was observed after treatment with the drug in Vata and Pitta Prakriti and was not significant in Kapha Prakriti. Highly significant decrease in mean Diastolic BP was observed after treatment with the drug in Pitta Prakriti and was insignificant in Kapha Prakriti. The study indicates that the individuals of Pitta Prakriti are more responsive to the drug as far as its effects on Systolic and Diastolic Blood Pressure are concerned. The study shows that the drug has a potential tranquilizing effect. There was statistically significant improvement in sleep among patients having disturbed sleep pattern.

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