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A Comparative Therapeutic Study of *Aswagandha* and *Kapikacchu* in the Management of Senile Dementia

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ABSTRACT

Senile dementia is a form of dementia occurring in late life and characterized by decline in multiple areas of cognition. Memory loss, cognitive decline, impaired conduct are described as a domain in many mental disorders *(mansika vyadhies)* in *Ayurvedic* classics. Senile dementia may fall parallel to these descriptions. This is a syndrome of acquired persistent dysfunction in two or more cognitive domains and hence agnosia, aphasia, apraxia, executive impairment, behavioral disturbances and neurological deficits are the major features of this disease with varying degree of incidence and severity. This disease was taken for study, so that its prevalence can be decreased and best, cheaper and easily available treatment can be available. 37 patients were enrolled for the study, randomly dividing them in 3 groups. 4, 5, and 2 patients were dropped out respectively from the group A, B, C and hence 26 patients completed the study. A questionnaire named Level of function scale was assessed. Group A and Group B were treated respectively with *Aswagandha* root powder and *Kapikacchu* seed powder, Group C with combination of both.

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Total period of study was 2 months with fortnightly follow ups. The variation in level of function scale score was analyzed in all groups. There was no significant overall change in the 'level of function scale' score in any of the group but 'bathing/Grooming' and 'Toileting' score are significantly improved in the group C. Hence these drugs in combination can improve toileting and bathing of the patient and help them to become mild independent in day to day activities.

KEYWORDS

Dementia, Ashwagandha, Kapikacchu, Level of function scale

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INTRODUCTION

An intact mental function including memory was always a major part of prayer in the Vedic era. The Medha Shuktam of Atharvaveda and Gayatri Mantra of Rigaveda reflect the importance of intellect for the people of Vedic era. Later in the prehistoric and historic era the descriptions of ageing and the declining domains of mental functions is described in the various treatise of that time[1]. But all the literatures indicate towards the decline of biological vitals, including cognition, due to normal ageing process. Cognitive decline as the main presentation due to specific pathology (what actually dementia is) is not directly referred to any of the disease mentioned in ancient classics. But memory loss, cognitive decline and impaired conduct can be found as a domain in many mansika vyadhies described in the treatise[2].

There is no ayurvedic parlance or concordance with dementia or senile dementia available in classical literatures. Mainly loss of smriti (memory) or medha (cognition) due to normal ageing is dealt in the ayurvedic classics. The description of pathological cognitive decline is found very scanty.

Ayurveda believes in the dichotomy of body and mind and has a holistic approach towards the degradation of their strength and function due to senility. The rejuvenation action of Aswagandha is described in classics. The ethno medical use of *kapikacchu* as neurotonic is documented in many national and international journals. The first description of Aswagandha (is found by the name '*ASMAGANDHA'* in the *Brahman Grantha*. *Astanga hridya* has indicated it first time as *Medha budhi vardhaka* (intellect promoting) [3]. It is also mentioned as jaravyadhi nashaka, balya and dhatuvardhaka in *nighantu ratnakara*. Probably the first description of *Kapikacchu* is available in *Shatpath Brahman* by the name of *Adhyanda*. *Kapikachu* by the name *Shesh harsini* has been mentioned in *Atharvaveda*. Ashtangahridya has mentioned it as ingredient of *Nagbaladi rasayana* which is indicated as *Jaranashaka(antiaging)*[4].

The effect of the two drugs on the level of function was evaluated separately and in combined form. The questionnaire for 'Level of function scale' is adopted for the scoring.

AIMS AND OBJECTIVES

To evaluate the effect of *Aswagandha* root powder and *Kapikacchu* seeds powder in the

management of senile dementia according to 'Level of function scale'.

MATERIALS AND METHODS

Selection of the disease-

It is estimated that more than 3.7 million people are affected by Dementia in our country. This is expected to be double by 2030. The cost of taking care of a person with Dementia is about Rs 43,000 annually. The challenge posed by Dementia as a health and social issue is of a scale we can no longer ignore. Hence this disease was taken for study, so that its prevalence can be decreased and best, cheaper and easy treatment can be available.

Selection of drugs-

Aswagandha being rejuvenative (Rasayana) as described in many classical literatures of Ayurveda; and **Kapikacchu**- an ethno medicine for neuro-disorders are selected for the study.

Collection of drugs

Aswagandha root and *kapikacchu* seeds were bought from the local market of Marufganj, Patna city, Patna and after determination of identity by faculty of PG. department of Dravyaguna, Govt. Ayurveda College, Patna.

Preparation of drugs-

Powder of both drugs was prepared according to SOPs mentioned in Schedule X (GMP) of Drug and Cosmetic act 1940. The hand sorted healthy roots of *Aswagandha* were cut into small pieces, dried, grinded and sieved properly to get the powder. *Kapikacchu* seeds were soaked overnight in cow's milk, boiled in the same for 15 minutes, washed thoroughly, testa is peeled off, and cotyledons are dried in open for 7 days, grinded and sieved to get the powder. The powders were packed and labelled with suitable codes.

Selection of patients-

By organizing a medical camp with proper advertisement in local newspaper, geriatric patients with cognitive impairment are called for screening at Government Ayurvedic College Hospital, Patna. Seventy two (72) patients were screened by a professional psychologist. Total 31 patients were selected for the study from OPD/IPD after taking written informed consent and were randomly allocated in three groups in the ratio of 1:1:1. The subjects were informed about the study procedure, aim of the study and possible side effects.

Criteria of selection-

Inclusion criteria – All patients having age of 65 yrs or more, who reached a mini mental state examination score of at least 10

but not more than 25 and fulfilling the DSM-III-R criteria for diagnosis of dementia are included in the study.

Exclusion criteria – Patients with complicated dementia or dementia of other aetiology like Parkinsonism, malignancy, alcohol or other toxic abuse; pseudodementia, having history of schizophrenia or affective psychoses and having history of less than 6 months or more than 5 years are excluded from the study.

Study design-

The trial was designed as a randomized single blind study. 37 patients were selected for the trial and divided into three groups, named as A, B, C respectively, but 26 patients completed the trial and 11 patients dropped out.

1. *Group A:* - 13 patients were given *Aswagandha* powder (orally*)* in the dose 3gm BD for 2 months twice daily with cow's milk, 4 patients dropped out the trial.
2. *Group B*: - 12 patients were given *Kapikachu* powder (orally*)* in the dose 3gm BD for 2 months twice daily with cow's milk 5 patients dropped out the trial.
3. *Group C:* - 12 patients were given mixture of *Aswagandha* and *Kapikachu* powder (orally) where both ingredients are in equal ratio in the dose 3gm BD for 2 months twice daily with cow's milk 2 patients dropped out the trial.

Follow up:-

The patients were provided with the trial drug(s) of 2 months (15 days at a time) with fortnightly follow ups. Another follow up was done after one month of completion of trial.

Criteria for assessment:

Assessment Criteria

All the patients/caregivers were asked to visit fortnightly to collect the medicine and report any unwanted effect during the treatment. At the end of 2 month the patients are again assessed for the two scores [MMSE and Level of function scale (LOF)] and other changes in the major symptoms are recorded.

The **Mini Mental State Exam (MMSE)** or **Folstein test** is an 11- item test with a total score of 0 (severe impairment) to 30 (no impairment). It is probably the most widely used screening instrument for dementia in the world, and it has been used in clinical trials. It includes very brief assessments of memory, language, praxis, and orientation. Major strengths of the MMSE are its coverage of a variety of relevant cognitive areas in a very brief test.

A Hindi version of the test (given below) is used in the present study for the better

efficacy in assessment, as all the patients are having hindi as their mother tongue.

MMSE

MINI MENTAL STATE EXAMATION

ORIENTATION

Time

		lgh	xyr	Marks	
1	vc lqcg ;k nksigj ;k “kke gS \	1		0	☐
2	vkt gQ~rs dk dkSu lk fnu@okj gSA	1		0	☐
3	vkt dkSu lh rkjh[k gS\	1		0	☐
4	;g dkSu lk efguk py jgk gSA	1		0	☐
5	;g lky dk dSu lk ekSle gS\	1		0	☐

Place

6	vHkh vki dSu ls jkT; esa gS\	1		0	☐
7	vHkh vki fdl ftys es gS\	1		0	☐
8	;g dkSu lk ’kgj gS \	1		0	☐
9	vHkh vki fdl vLirky esa gS\	1		0	☐
10	vHkh vki fdl rYys ij gS\	1		0	☐

REGISTRATION ☐

11	eSa fnYyh x;k Fkk vkSj ogka ls rhu phtsa yk;k] os gS & vke] dqlhZ] iSlkA	1	2	0	

vc D;k vki crk ldrs gS fd oks rhu phtsa

eSus fnYyh ls ykbZ oks D;k gS \

bu rhu phtksa dks tks eS fnYyh ls yk;k FkkA

;kn jf[k;sxk] dqN nsj ckn eSa fQj iqNwaxkA

ATTENTION AND CALCULATION

12	¼d½ vc vki gQ~rs ds fnuks ds uke crkb;sA “kq: brokj ls dhft;sA	1	2	3	4	5	☐

¼[k½ vc bUgh fnuksa ds uke mYVk crkb;sA

RECALL

13 og rhu phtsa gS tks eSusa vkidks crkbZ fd eS fnYyh ls yk;k Fkk\ **1 2 3** ☐

LANGUAGE

¼mUgsa gWkFk ?kMh fn[kkdj iqNsa½ ^^ ;g D;k gS \ ^^ **1 0** ☐

16 ¼mUgsa dye fn[kkdj iqNsa½ ^^ ;g D;k gS \ ^^ **1 0** ☐

REPETITION

17 Instruction :vc eSa vkidks ,d ckr lqukm¡xk] mls ?;ku ls lqfu;s vkSj esjs dgus ds **1 0** ☐

ckn eq>s fcydqy oSlk gh dgdj lqukb;sxk A

^^ uk ;s] uk os ^^

READING

18 vc vki esjs psgjs dh rjQ nsf[k;s & tSlk eSa dj jgk gw¡ oSlk gh djds fn[kk;sa **1 0** ☐

/;ku ls lqfu;s vkSj eSa crkma oSlk gh dfj;sA

viuh vka[ka can dhft;sA

COMMAND

19 eSa vkidks ,d dkxt nwaxk] mlds lkFk tks eSa crkma oSlk gh dfj;s **1 2 3** ☐

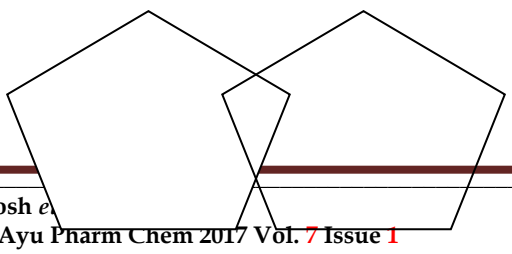
WRITING/SPEAKING

20 vc vki vkius ?kj@edku ds ckjs es ,d ckr dg dj@cksydj lqukb;sA **2 0** ☐

¼ dqN Hkh ckr vius ?kj ds ckjs es ½A

DRAWING

21 ;g rLohj gSA vki fcydqy ,slk gh bl dkxt ij cukbZ;saA **2 0** ☐



TOTAL

The **Level of Function Scale** is a crude form of Instrumental activity of daily living. In this scale the independence of the patient in general day to day work is assessed. More the score more is the dependence on others to perform the work. Based on the subjective parameters this scale measures "how much the cognitive decline including memory impairment has affected his/her level of functioning in the routine works of the patient". The scale is given in **Table- 1.**

Table 1 Grading of Different Symptoms

	Independent, as good as ever	Independent, not as good as past	Needs prompting or Reminding to perform task	Needs hands On help or Step-by-step Directions	Can't do, Depends on others to do
Work responsibilities	**0**	**1**	**2**	**3**	**4**
Hobbies	**0**	**1**	**2**	**3**	**4**
Household chores	**0**	**1**	**2**	**3**	**4**
Shopping for needs	**0**	**1**	**2**	**3**	**4**
Driving	**0**	**1**	**2**	**3**	**4**
Finding one's thing	**0**	**1**	**2**	**3**	**4**
Dressing	**0**	**1**	**2**	**3**	**4**
Bathing/grooming	**0**	**1**	**2**	**3**	**4**
Eating	**0**	**1**	**2**	**3**	**4**
Toileting	**0**	**1**	**2**	**3**	**4**
Using telephone	**0**	**1**	**2**	**3**	**4**
Watching TV	**0**	**1**	**2**	**3**	**4**
Pay attention to conversation	**0**	**1**	**2**	**3**	**4**
Find personal belongings	**0**	**1**	**2**	**3**	**4**
Turn on/off lights	**0**	**1**	**2**	**3**	**4**

Total score	

For minute assessment of the changes during the study, the scores of different factors of the MMSE and Level of function scale were assessed separately. For this the scales are fragmented into sections as follows:

Factors of MMSE

Orientation score 0-10

Registration Score 0-2

Attention & calculation Score 0-5

Recall Score 0-3

Language Score 0-2

Repetition	Score 0-1	3 - Needs hands on help or Step-by-step Directions
Reading	Score 0-1	4 - Can't do, Depends on others to do
Command:	Score 0-3	**Shopping for needs**
Writing or speaking	Score 0-2	0 - Independent, as good as ever
Drawing	Score 0-2	1 - Independent, not as good as past

Factors of Level of function scale

Work responsibilities

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Hobbies

0 – Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or reminding to perform task

2 - Needs prompting or reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Finding one's own things

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, depends on others to do

Dressing

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Bathing/grooming

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Eating

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Toileting

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Pay attention to conversation

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Find personal belongings

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do

Turn on/off lights

0 - Independent, as good as ever

1 - Independent, not as good as past

2 - Needs prompting or Reminding to perform task

3 - Needs hands on help or Step-by-step Directions

4 - Can't do, Depends on others to do.

Statistical analysis

It was performed with Sigma Stat Software for Windows (Version 3.5) Build 3.5.0.54.2006 Systal Software, Inc. Since in this study there are four groups therefore the **Kruskal- Wallis analysis of variance (ANOVA)** was performed to detect difference between groups (as it is applied for three or more groups). The scores of Cognitive assessment –Level of function scale was the factor of **ANOVA** model. The significant change in any group if revealed by **ANOVA** technique is further analyzed as intragroup changes in scores (base line versus end point) using **paired t-tests**. The mean change in the scores from baseline is

calculated and plotted in graphs. All data are expressed as **mean ± standard deviation;** interval of confidence was at 95% (**C.I. = 95%**).

Table 2 Intergroup comparison of Level of function scale scores after treatment

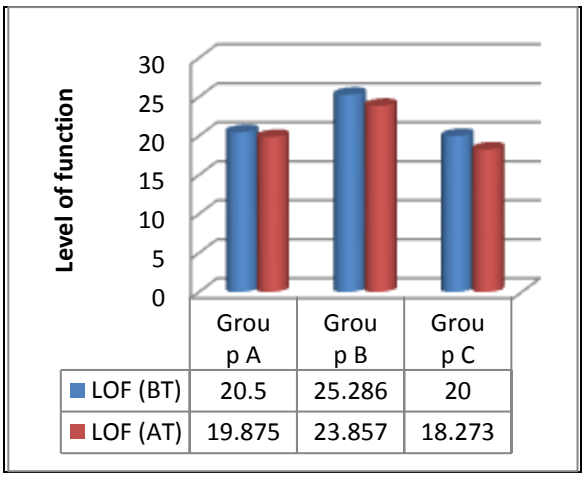
Group Name	N	Mean	SD	SEM
Group A	8	19.875	5.463	1.931
Group B	7	23.857	8.275	3.128
Group C	11	18.273	5.312	1.602

RESULTS

The scores of Level of function scale after the treatment are plotted and the analysis of variance is calculated for the groups. The results obtained are stated and tabulated in **Table-2** and plotted in **Figure 1**).

The differences in the mean values among the treatment groups are not great enough to exclude the possibility that the difference is due to random sampling variability; there is not a statistically significant difference (P = 0.107).

Figure 1 Bar diagram showing effect of therapies on Level of Function (LOF) Scale



EFFECT OF THERAPY ON LEVEL OF FUNCTION SCALE IN EACH GROUP

[EFFECT OF THERAPIES ON DIFFERENT FACTORS (DOMAINS) OF LOF]

Group-A-Among the different factors of Level of function scale *Aswagandha* is not shown to exhibit any statistically significant change in any of the factors (**Table-3**).

Group-B- Among the different factors of Level of function scale *Kapikacchu* is not shown to exhibit any statistically significant change in any of the factors (**Table-4**).

Group-C- Among the different factors of Level of function scale Aswagandha and Kapikacchu is found to exhibit statistically significant change in **Bathing and grooming** score ($p = 0.006$, i.e. $p \leqslant 0.05$) and in **Toileting** score ($p = 0.038$, i.e. $p \leqslant 0.05$) (**Table-5**).

DISCUSSION

There is no ayurvedic parlance for dementia or senile dementia available in classical literatures of Ayurveda. Mainly loss of smriti (memory) or medha (cognition) due to normal ageing is dealt in the classics. The description of pathological cognitive decline is found very scanty. The senile dementia patients progressively get dependent on their

care givers for their daily work which is reflected in the progressive worsening score of their 'Level of function scale'. After administration for 2 months the patients 'Level of function scale' showed no overall improvement by any of the drug, i.e. *Aswagandha* and *Kapikacchu* alone or combined. While in combination they showed good improvement in bathing and toileting. Hence this treatment can help them in becoming mild independent.

Factors	Mean score		%	SD	SEM	T	p
	B.T.	A.T.					
Work responsibilities	2.492	2.492	0.00	1.134	0.429	0.000	1.000
Hobbies	1.000	1.143	-14.28	0.378	0.143	-1.000	0.356
Household chores	2.714	2.571	5.26	0.378	0.143	1.000	0.356
Shopping for needs	1.857	1.857	0.00	0.000	0.000	0.000	1.000
Finding one's thing	2.143	2.143	0.00	0.000	0.000	0.000	1.000
Dressing	1.714	1.429	16.67	0.488	0.184	1.549	0.184
Bathing/grooming	1.714	1.714	0.00	0.000	0.000	0.000	1.000
Eating	1.143	0.857	25.00	0.488	0.184	1.549	0.172
Toileting	1.143	1.000	12.50	0.378	0.143	1.000	0.356
Pay attention to conversation	2.143	1.714	20.00	0.535	0.202	2.121	0.078
Find personal belongings	2.143	2.000	6.67	0.378	0.143	1.000	0.356
Turn on/off lights	1.714	1.571	7.29	0.378	0.143	1.000	0.356

Table 3 Effect of treatment on different factors of LOF on Group A
(C.I. = 95% or p ⩽0.05 will be considered significant) Degree of freedom (DF) =7 for each readings)

Table 4 Effect of treatment on different factors of LOF on Group B

Factors	Mean score		%	SD	SEM	T	P
	B.T.	A.T.					
Work responsibilities	2.250	2.375	-5.55	0.354	0.135	-1.000	0.351
Hobbies	0.875	0.875	0.00	0.000	0.000	0.000	1.000
Household chores	1.500	1.205	16.67	0.886	0.313	1.528	0.170
Shopping for needs	1.000	1.125	-12.50	0.354	0.125	-1.000	0.351
Finding one's thing	2.125	1.875	11.77	0.463	0164	1.528	0.170
Dressing	1.500	1.500	0.00	0.535	0.189	0.000	1.000
Bathing/grooming	1.875	1.750	6.67	0.354	0.125	1.000	0.351
Eating	0.750	0.750	33.33	0.000	0.000	0.000	1.000
Toileting	1.125	1.125	0.00	0.000	0.000	0.000	1.000
Pay attention to conversation	1.750	1.875	7.14	0.354	0.125	1.000	0.351
Find personal belongings	1.750	1.500	14.28	0.463	0.164	1.528	0.170
Turn on/off lights	1.750	1.625	7.14	0.354	0.125	1.000	0.351

(C.I. = 95% or p ⩽0.05 will be considered significant)Degree of freedom (DF) =6 for each readings)

Table 5 Effect of treatment on different factors of LOF on Group C

Factors	Mean score		%	SD	SEM	T	P
	B.T.	A.T.					
Work responsibilities	1.909	2.000	-4.76	0.302	0.0909	-1.000	0.341
Hobbies	0.455	0.636	-40.00	0.405	0.122	-1.491	0.167
Household chores	1.636	1.727	-5.55	0.302	0.091	-1.000	0.341

Shopping for needs	1.091	1.182	-8.33	0.302	0.091	-1.000	0.341
Finding one's thing	1.545	1.455	5.88	0.302	0.091	1.000	0.341
Dressing	1.545	1.182	23.53	0.674	0.203	1.789	0.104
Bathing/grooming	1.909	1.364	28.57	0.522	0.157	3.464	**0.006**
Eating	0.909	0.727	20.00	0.405	0.122	1.491	0.167
Toileting	1.364	1.000	26.67	0.505	0.152	2.390	**0.038**
Pay attention to conversation	1.455	1.182	17.19	0.647	0.195	1.399	0.192
Find personal belongings	1.818	1.638	14.28	0.405	0.122	1.491	0.167
Turn on/off lights	2.000	1.909	4.16	0.302	0.091	1.000	0.341

(C.I. = 95% or p ⩽0.05 will be considered significant) Degree of freedom (DF) =10 for each readings)

CONCLUSION

Based on the statistical analysis of the Level of function scale score among the 3 groups of the patients, within the limitations of the study, it can be stated that *Aswagandha* and *Kapikacchu* powder orally has no significant effect on improving the instrumental activity of daily living in the senile dementia patients in a period of 2 months. This result may be due to short duration of the treatment and also due to the fact said by *Acharya Sharangdhara* Rasayana is not useful in old age due to pakva sharir (No new formation of healthy cells), but these drugs can be helpful to make them mild independent in case of bathing, toileting, as these are the major problems in these patients which makes them dependent.

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