

COMPARATIVE CLINICAL EVALUATION ON THE EFFECT OF GUDUCHI VATI AND YASTIMADHU VATI ON MEDHA (ACADEMIC PERFORMANCE) IN SCHOOL GOING CHILDREN

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ABSTRACT

Medha is a concept in Ayurveda where man has always failed to arrive at a definite conclusion. As per the ayurvedic classics, *Medha* is the retention power of an individual or is the unobstructed and uninterrupted perception and retention of knowledge in all the aspects of an object ^[1] Academic Performance of an individual is an outcome of his mental and physical potential. Recent studies show that the intellectual abilities of students have a positive association with their scholastic achievement. ^[2] *Acharya Charaka* has mentioned 4 individual drugs under *Chara-koktha Medhya Rasayanas* for their action on *Medha* ^[3] and *Guduchi Swarasa* and *Yastimadhu Ksheerapaka* are mentioned among them. In this study, an attempt was made to evaluate the *Medhya* effect of *Guduchi Vati* and *Yastimadhu Vati*. The study was a comparative clinical study with a total subject of 40, where 20 patients were administered with *Guduchi Vati* and the other 20 with *Yastimadhu Vati*. The study showed a statistically significant result where the *Guduchi Vati* is having similar action to that of *Yastimadhu Vati* on *Medha* (Academic Performance) in School going children.

Keywords: *Guduchi Vati*, *Yastimadhu Vati*, *Medha*, Academic Performance

INTRODUCTION

Medha is a concept in Ayurveda where man has always failed to arrive at a definite conclusion. As per the ayurvedic classics, *Medha* is the retention power of an individual or is the unobstructed and uninterrupted perception and retention of knowledge in all the aspects of an object.

The Academic Performance of an individual is an outcome of his mental and physical potential; besides the experience, he has gained in the process of exploration and learning. If we consider a group of students, it is normal that a few students are found to be high achievers on the one hand, and a few are underachievers on the other, while a sizable number of students usually appear as moderate achievers. Does the question arise why such a difference in achievement appears when the schools provide uniform instructional and environmental faculties? Various investigations and studies have explored numerous factors which are found responsible for academic success and failure. The most important factor among them is intellectual ability. Recent studies show that the intellectual abilities of students have a positive association with their scholastic achievement.^[4]

Understanding the intellectual process is a complex phenomenon. But in a broad sense, we can describe intelligence as an aggregate or global capacity of an individual to act purposefully to think rationally and to deal effectively with his environment.^[5] A decrease in Intelligence level may limit an individual in areas such as learning, reasoning, communication and self-help skill.

Mind and intellect are among the phenomena on which man always failed to reach a definite conclusion. Human being has conquered the peaks in all aspects of life because of unlimited thoughts as well as ambitions. The pace of life got increased and human beings have become accustomed to a competitive world. The competitive spirit is being injected by society even into the brain of children. Once a child is born the parents start designing his or her future to build him up as a doctor or engineer. Many parents are ready to purchase supplements for their children to prepare them for the exams. The scientists, as well as businessmen, have

come forward to take the "enhance memory" or as "IQ Booster" to take advantage of this situation and the idea is utilized by multinational companies for monetary benefits.

In Ayurveda, a group of drugs mentioned as *Medhya Rasayanas* are established in boosting brain function and making the brain healthier also. ^[6] *Medhya Rasayanas* (Herbal nootropic drugs) are a group of medicinal plants described by *Acharya Charaka* which helps in improving memory and intellect by its *Prabhava* (specific action). ^[7] *Acharya Charaka* has mentioned 4 individual drugs under *Charakoktha Medhya Rasayanas* ^[8] *Guduchi Swarasa* and *Yastimadhu Ksheerapaka* are mentioned among them. *Medhya* drugs activate brain function by improving the function of *Agni* and better circulation of *Rasa* by cleaning the microchannel.^[9] The main function of *Medhya Rasayanas* is to improve the power of grasping, power of retention, power of discrimination and power of recollection. In this study, an attempt was made to evaluate the *Medhya* effect of *Guduchi* and *Yastimadhu* which was modified into *Vati* form for the convenience of the subjects.

MATERIALS AND METHODS

Study Design: Randomised comparative clinical study

Sample Size Estimation: As per the incidence of the condition, the sample size estimation was done and implemented for the clinical study. In the present study, 40 patients fulfilling the diagnostic and inclusion criteria were registered. They were assigned randomly into two equal groups A and B for the study through the lottery method.

Sample Size: 40 subjects were selected and divided into two groups of 20 each.

Duration of Study: 45 days

Method of Sampling: Simple Random Sampling

Diagnostic Criteria: Diagnosis will be made based on Academic Performance using School progress records-cut off marks below 50%.

Inclusion Criteria: Students of either gender, aged between 10-16 years regularly attend classes with academic marks below 50%

Exclusion Criteria:

Students suffering from any psychiatric illness and students suffering from any systemic illness.

Specification of the nature of the Study:

1. Diagnostic Phase
2. Interventional Phase
3. Assessment Phase

Diagnostic Phase – it was done based on diagnostic, inclusion and exclusion criteria.

Interventional Phase – the study intervened by treatment with *Guduchi Vati* and *Yastimadhu Vati*.

Group A: *Guduchi Choorna* was taken in Q.S part and was pounded to a fine powder and triturated with freshly collected *Guduchi Swarasa* to get *Samyak Bhavita Lakshana*. After the attainment of *Samyak Bhavita Lakshana*, the mixture was dried. This procedure was done for 3 days. The collected dry powder was made into *Vati* form.

Group B: *Yastimadhu Choorna* was taken in Q.S part and was pounded to a fine powder and triturated with freshly collected *Ksheera* to get *Samyak Bhavita Lakshana*. After the attainment of *Samyak Bhavita Lakshana*, the mixture was dried. This procedure was done for 3 days. The collected dry powder was made into *Vati* form.

Duration of Study: 30 days

Follow up: The patient was observed before the treatment and on the 30th day after the treatment and the 45th day.

Total study duration: 45 days

Assessment Phase – Assessment was done based on subjective and objective parameters.

Subjective Parameters

- 1) Reduced concentration (0-3)
- 2) Poor attention (0-3)
- 3) Poor grasping power (0-3)
- 4) Poor retention (0-3)
- 5) Lethargy (0-3)

Scoring: 0 -Absent, 1 - Mild, 2 - Moderate, 3 - Severe.

Objective Parameters:

- 1) Academic Performance in School
- 2) Malins Intelligence Scale

And the further analysis was done by Statistical tests, within-group – paired t-test and Wilcoxon signed-rank test, between Group – unpaired t-test and Mann Whitney u test was applied.

Assessment of Overall effect of the treatment:

The overall effect of the intervention was estimated in the following 4 categories.

Table 1: Overall Effect

1. Marked improvement	76 -99 %
2. Moderate improvement	51 – 75 %
3. Mild improvement	26 – 50 %
4. No improvement	< 25 %

OBSERVATION AND RESULT

Effect on Academic Performance

Table 2: Effect on Academic Performance in Group A

AP	MEAN BT	MEAN AT	MEAN FU	% IMP	SEM	t value	p-value
KANNADA	44.95	50.15	49.25	11.56 %	1.307	3.978	<0.001
ENGLISH	43.90	49.30	49.75	12.3 %	1.139	4.742	<0.001
HINDI	43.65	47.80	49.75	9.50 %	0.737	5.629	<0.001
SOCIAL	43.35	48.00	48.70	10.72 %	1.032	4.507	<0.001
SCIENCE	43.30	50.40	51.05	16.39 %	1.526	4.850	<0.001
MATHS	42.45	49.15	50.05	15.78 %	1.29	5.186	<0.001

Table 3: Effect of Academic Performance in Group B

AP	MEAN BT	MEAN AT	MEAN FU	% IMP	SEM	t value	p-value
KANNADA	46.40	48.90	48.30	5.38 %	0.478	5.225	<0.001
ENGLISH	45.05	47.00	46.95	4.32 %	0.407	4.791	<0.001
HINDI	43.50	45.60	45.55	4.82 %	0.422	4.972	<0.001
SOCIAL	45.35	47.75	47.10	5.29 %	0.510	4.707	<0.001
SCIENCE	44.85	48.00	48.15	7.02 %	0.509	6.185	<0.001
MATHS	42.75	46.30	46.80	8.30 %	0.484	7.337	<0.001

Table 4: Effect of Academic Performance between Group A and B

AP	MEAN		MEAN DIFFERENCE (A – B)	SD		SE		t value	p-value
	A	B		A	B	A	B		
KANNADA	50.150	48.900	1.250	4.771	4.723	1.067	1.056	0.833	0.410
ENGLISH	49.300	47.000	2.300	6.760	5.058	1.512	1.131	1.218	0.231
HINDI	47.800	45.600	2.200	6.254	5.030	1.398	1.125	1.226	0.228
SOCIAL	48.00	47.750	0.250	8.092	5.618	1.809	1.256	0.113	0.910
SCIENCE	50.400	48.000	2.400	6.969	6.078	1.558	1.359	1.161	0.253
MATHS	49.150	46.300	2.850	9.098	5.723	2.034	1.280	1.186	0.243

Effect on Intelligence Quotient

Table 5: Effect on Verbal and Performance IQ in group A

IQ	MEAN	SD	SE	value	p-value
Verbal BT	87.300	5.283	1.181	595	0.018
Verbal AT	88.050	4.785	1.070		
Per BT	88.100	4.471	1.000	290	0.004
Per AT	88.850	4.184	0.935		

Table 6: Effect on Total Intelligence Quotient within the Group A

PARAMETER	Mean BT	Mean AT	Mean FU	% IMP	SEM	t - value	p-value
IQ	87.70	88.45	88.80	0.855 %	0.204	3.684	< 0.05

Table 7: Effect on Verbal and Performance IQ in group B

IQ	MEAN	SD	SE	t	p
Verbal BT	86.850	3.453	0.772	2.651	0.016
Verbal AT	87.300	3.246	0.726		
Per BT	87.100	2.989	0.668	1.926	0.069
Per AT	87.450	3.052	0.682		

Table 8: Effect on Total Intelligence Quotient within the Group B

PARAMETER	Mean BT	Mean AT	Mean FU	% IMP	SEM	t - value	p-value
IQ	87.00	87.35	87.10	0.04 %	0.109	3.199	< 0.05

Table 9: Comparison of treatment on Total IQ Between the group A & B

PARAMETER	MEAN		MEAN DIFFERENCE (A – B)	SD		SE		t value	p-value
	A	B		A	B	A	B		
IQ	88.450	87.350	1.100	3.316	2.739	0.742	0.612	1.144	0.260

Table 10: Comparison of treatment on Verbal and Performance IQ Between the groups A & B

IQ	MEAN	SD	SE	t value	p-value
VERBAL	88.050	4.785	1.070	0.580	0.565
PER	87.300	3.246	0.726		

Effect on Intelligence Quotient

Table 11: Effect on Clinical Symptoms in Group A

Clinical Symptoms	Mean BT	Mean AT	Mean FU	% IMP	wsrt - value	p-value
Reduced concentration	2.45	1.00	1.80	59.18 %	3.923	<0.001
Poor Attention	2.20	1.10	1.85	50 %	3.824	<0.001
Poor Grasping Power	2.70	1.35	1.75	50 %	3.835	<0.001
Poor Retention	2.75	0.90	1.55	67.27 %	3.976	<0.001
Lethargy	1.80	1.05	0.95	41.66 %	3.873	<0.001

Table 12: Effect on Clinical Symptoms within the Group B

Clinical Symptoms	Mean BT	Mean AT	Mean FU	% IMP	wsrt - value	p-value
Reduced concentration	2.40	1.65	1.70	31.25 %	3.638	<0.001
Poor Attention	2.55	1.55	1.95	39.21 %	3.879	<0.001
Poor Grasping Power	2.55	1.40	1.45	45.09	3.758	<0.001
Poor Retention	2.45	1.60	1.55	34.69 %	3.9	<0.001
Lethargy	2.45	1.55	1.65	36.7 %	3.662	<0.001

Table 13: Comparison of treatment on Clinical Symptoms between the group A & B

SYMPTOMS	MEAN	SD	Mann – Whitney u Test		
			U value	Z score	P-value
Reduced Concentration (BT – AT)	1.10	0.709	96	3.158	< 0.05
Poor Attention (BT – AT)	1.05	0.639	190	0.327	> 0.05
Poor Grasping Power (BT – AT)	1.45	0.742	178.5	0.646	> 0.05
Poor Retention (BT – AT)	1.35	0.834	71.500	3.888	< 0.001
Lethargy (BT – AT)	0.82	0.549	167.500	1.161	> 0.05

Overall Effect of Therapies

Table 14: Overall effect in Group A

CLASS	GRADING	SUBJECTS
< 25 %	No change	0
26 – 50 %	Mild Improvement	4
51 – 75 %	Moderate Improvement	6
> 75 %	Marked Improvement	10

Table 15: Overall Effect in Group B

CLASS	GRADING	SUBJECTS
< 25 %	No change	0
26 – 50 %	Mild Improvement	4
51 – 75 %	Moderate Improvement	9
> 75 %	Marked Improvement	7

DISCUSSION

A major part of the life of children is spent in school.^[10] Children tend to absorb, conceptualize, synthesize, and express in the early years through school activities. School performance is a key mechanism through which adolescence learn about their talents, abilities, competencies, which are an important part of developing career aspirations.^[11 - 12] But success and acceptance in the school setting depend on children's physical, cognitive, social and emotional adjustment.

Attention level is a key contributor to a child's academic performance. Higher academic performance reflects a higher level of attention, while lower performance reflects a lower level of attention.^[13] Many studies show that in school children, fatigue can lead to a decline in school performance.^[14] Research in psychology has revealed that scores on memory tests are a useful predictor of several cognitive skills even academic performance.^[15]

As per classical references, both *Guduchi* and *Yastimadhu* is said to have *Phalashruti* of *Rasayana* "Dheergamayusmritimedha". This concept was proved again with the help of a clinical experiment.^[16] Both the drugs have strong antioxidant properties and act as a brain tonic. The results of many studies suggest the nootropic action of both drugs involving cholinergic and GABAergic modulation.^[17]

The *Medhya Karma* is considered as *Prabhava Jayna* because some *Medhya Dravya* are *Sita Virya*, *Madhura Rasa* and *Madhura Vipaka* e.g., *Yastimadhu*; and some are *Tikta Rasa* and *Usna Virya* e.g., *Guduchi*. These *Medhya Dravya* have more *Medhya Karma* present rather than a *Samanya Dravya*, so, *Medhya Karma* is *Prabhava Janya*.^[22] *Grahana Shakti* (power of acquisition), *Dharana shakti* (power of retention) and *Smriti* (power of recollection), all three are included in *Medha*. *Pitta* is *Ashu* and *Tikshna*, so it is helpful in *Vishaya Grahana* and *Smriti*, that's why *Medha* is included in *Prakrit Karma* of *Pitta*. *Vata* is also necessary for the association of ideas in the process of *Smriti*. *Kapha* provides *Dhriti* (*Dharana*) and stability that's why *Sthirita* and *Dhriti* are included in *Prakrit Karma* of *Kapha*. Due to all these reasons, the *Usna Virya* and *Sita Virya Dravya* should be *Medhya*. But *Usna Virya Dravya* for *Vishaya Grahana* and *Smriti* rather than *Sita Virya* for *Dharan Shakti*.^[23]

CONCLUSION

The data reported in this study confirm and authenticate the effect of *Guduchi Vati* and *Yastimadhu Vati* on *Medha* (Academic Performance). Statistical Analysis further proved that both the drugs help in reducing anxiety, stress which results in better academic performance as indicated by better total scores. Both *Guduchi Vati* and *Yastimadhu Vati* showed a statistically significant effect on the assessment criteria i.e.,

in subjective and objective parameters. But in comparison between the 2 groups, we were not able to find any significant difference. Thus, there is an equivalent effect of *Guduchi Vati* and *Yastimadhu Vati* on *Medha* (Academic Performance) in school-going children.

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