



## A CLINICAL STUDY TO EVALUATE THE EFFECT OF GUDUCHYADI SYRUP IN ENHANCEMENT OF MEDHA IN SCHOOL GOING CHILDREN

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## ABSTRACT

Academic underachievement of children is a big concern among parents and teachers in present day competitive society. It is reported that around 20% of school children have scholastic backwardness include physical illness, below average Intelligence, Learning Disabilities, Attention Deficit Hyperactive Disorder, Psychiatric Disorder, family and school factors. Intelligence is usually said to involve mental capabilities such as the ability to reason, plan, solve problems, think abstractly, comprehend ideas and language, and learn. In spite of advancement in modern medicine, its success is very limited in context with the enhancement of Intellectual power and memory. **Objectives:** 1) To select subject with IQ ranging from 70 – 89 and study in detail about the factors influencing the Intelligence. 2) To evaluate the effect of *Guduchyadi* Syrup in the enhancement of *Medha* in school going children.

**Materials and Methods:** An interventional Randomized Placebo Controlled Clinical study was conducted, in which 30 subjects were assigned in both Group A and Group B and given with *Guduchyadi* syrup and Sugar

syrup respectively, with a dose of 5ml thrice a day after food for duration of 3 months. Follow up was done on 30<sup>th</sup> day after completion of the treatment.

**Interpretation and Result:** Both the groups showed significant result in Subjective and Objective parameters.

**Conclusion:** Both *Guduchyadi* syrup and Sugar syrup are having significant effect on *Medha*. The effect is considered to be consistent or improved even after follow up. But the change was less for the group given with Sugar syrup compared to the effect of *Guduchyadi* syrup.

**Keywords:** *Medhya*, Intelligence, Intelligence Quotient, *Guduchyadi* syrup, Sugar syrup

## INTRODUCTION

In Ayurvedic classics '*Medha*' has been defined as main as unobstructed and uninterrupted perception and retention of the knowledge in all the aspects of an object. Besides this, *Buddhi*, *Smriti*, *Dhi* etc. are different entities used to mention different aspects of *Medha*. For the cognition of sense, objects conjoin with senses and senses with *Manas*. *Buddhi Vyapara* (discrimination) follows just after it. *Buddhi* works on it by reasoning and logic and reacts accordingly. Finally, the gained knowledge gets stored for further use. Retention of cognition takes place under the area of *Medha*. When any stimulant comes against, those stored experience comes in mind, recollection happens, which is the area of *Smriti*. If the knowledge or experiences are not encoded and retained properly then all the efforts of recalling would be in vain. Thus, the process of recollection takes place properly only after the *Buddhi Medha* and *Smriti* unite. In this process *Buddhi* helps in encoding; *Medha* in retention and *Smriti* facilitate recollection<sup>1</sup>.

Intellectual ability is a complex phenomenon, influenced by factors both environmental and biological. In broad sense, intelligence is what people use to learn, remember, solve problems and in general, deal effectively with the world around them. Decreased intelligence may occur due to any Genetic, physical or psychological reason, or may be due to adverse environment for the development. Decrease in Intelligence level may limit an individual in areas such as learning, reasoning, communication and self-help skills. There are a number of different methods which to measure intelligence, the most famous of which is the "I.Q." or 'Intelligence Quotient' test<sup>2</sup>. A specific intervention may contribute to better

performance in school. *Medhya Rasayana*, the group of drugs explained in *Ayurvedic* classics are considered to be having immense action on the *Medha*. *Guduchyadi rasayana* is one such formulation explained in *Bhaishajya Ratnavali – Rasayanaadhikara*.<sup>3</sup> In this study an attempt was made to evaluate the *Medhya* effect of *Guduchyadi Rasayana* which was modified as Syrup form for the convenience of the subjects.

### Objectives

1. To select subject with IQ ranging from 70 – 89 and study in detail about the factors influencing the Intelligence.
2. To evaluate the effect of *Guduchyadi* Syrup in enhancement of *Medha* in school going children.

### Materials & Methods

#### Source of Data:

**Literary source:** Textbooks of Ayurvedic and Modern medicine, journals, articles and information from reliable internet sources, about the disease and the drugs were reviewed.

**Sample Source:** Subjects were selected randomly from High Schools in and around Moodbidri, special medical camps and other sources.

**Drug Source:** Raw drugs were collected from the available local market and the syrup was prepared in the Rasa Sastra and Bhaishajya Kalpana Lab, Alva's Ayurveda Medical College, Moodbidri.

#### Method of Preparation:

***Guduchyadi* Syrup:** All drugs were taken in equal quantity and cleaned in running water to remove dirt and later dried and then made into coarse powder and mixed together and added with 16 times water and boiled and reduced to 1/8 to prepare *Kashaya* and was

sieved and collected in a vessel and heated. 35% of Sugar was added to the *Kashaya* and heated till it attains one thread consistency. The syrup prepared was kept for self cooling to normal temperature. Later it was collected in 100 ml bottles.

**Sugar Syrup:** Quantity sufficient water was taken and kept for boiling. 35% of sugar was added to it and stirred well and heated until the one thread consistency was attained. The sugar syrup was kept for self cooling and later collected in 100ml bottles.

**Method Of Collection Of Data:**

**Study Design:** A Randomized Placebo - Controlled clinical study.

**Sampling Method:**

**Random sampling method:** Subjects Fulfilling the Diagnostic and Inclusion criteria were selected by conducting screening camp at Schools in and around Moodbidri. The samples were selected by giving equal and independent chances of selection to each and every children of the population between 13 to 15 yrs of age. Subjects were selected in Simple Random method and assigned in to two groups, Group A (Trail) and Group B (Control).

**Sample Size:** 65 subjects

**Selection Criteria:**

**Diagnostic Criteria:** Diagnosis was made using Wechsler Intelligence Scale (Malin’s Intelligence Scale for Indian Children). Students with IQ Score ranging from 70 – 89 were selected for the study.

**Inclusion Criteria:**

1. Students with IQ between 70 - 89
2. Age group of 13 to 15 yrs.
3. Students of either Gender.

**Exclusion Criteria:**

1. Children with Learning Disability, Mental Retardation, and Attention Deficit Hyperactive Disorder.
2. Children with other Developmental disorders.
3. Children suffering from any Systemic disorders.

**Procedure of Administration of the Drug:**

**Group A** – Trial group was given with *Guduchyadi Syrup*.

**Group B** – Control group was given with Sugar syrup.

**Mode of Administration:** Orally

**Dose:** 5 ml trice a day after food for all subjects irrespective of Age.

**Duration:** 3 Months.

**Observation Period:**

- Treatment duration: 90 days
- Assessment of subjects was done BT, on 45<sup>th</sup>, and 90<sup>th</sup> day.
- Follow up period: Follow up study will be done on 30<sup>th</sup> day after completion of the treatment.
- Total study duration including follow up: 120 days.

**Assessment Criteria:**

The Assessment parameters used for the study include:

- *Medha Grahanena*
- *Smriti Smaranena*
- *Dhritii Alaulyena*
- *Vijnanam Vyavasayena*
- Indian adaptation of Wechsler Intelligence scale for Children. (Malin’s Intelligence Scale for Indian School Children) was adopted to assess the IQ before and after the treatment.

**Table 1:** Grading of *Medha*:

<i>Medham Grahanena</i>	Score
Can grasp the event at an instance, no confusional status	3
Can grasp the events at an instance, but get confused	2
Delayed grasping with frequent confusion	1
Grasping and understanding is difficult with lack of confusion	0

**Table 2:** Grading of *Smriti*:

<i>Smritim Smaranena</i>	Score
Both remote and recent memory are clear with easy retention and recall	3
Both remote & recent memory clear, but retention and recall are not seen	2
Remote memory is impaired, but recent memory is intact. Power of retention and recall not seen	1
Both remote and recent memories are impaired, difficult retention & recall.	0

**Table 3:** Grading of *Dhriti*:

<i>Dhritim Alaulyena</i>	Score
Courageous on all occasions	3
Courageous if supports are there	2
Occasionally courageous if strong support is there	1
No change at all	0

**Table 4:** Grading of *Vijnana*:

<i>Vijnanam Vyavasayena</i>	Score
Self-efficient and sufficient to direct and do various activities himself.	3
Self efficient and sufficient and do various activities with help of others.	2
Not self efficient and sufficient, guidance required in each and every work	1
Cannot do or direct any activity with loss of insight.	0

**Malin’s Intelligence Scale for Indian Children - MISIC**

(Indian adaptation of Wechsler Intelligence Scale for Children.)

This includes:

- | <b>Verbal</b>    | <b>Performance</b>     |
|------------------|------------------------|
| 1. Information   | 7. Picture Completion  |
| 2. Comprehension | 8. Picture Arrangement |
| 3. Arithmetic    | 9. Block Design        |
| 4. Similarities  | 10. Object Assembly    |
| 5. Vocabulary    | 11. Coding             |
| 6. Digit span    | 12. Mazes              |

**Gradation of IQ Scores:** IQ test results were distributed according to the following classification given by NIMH (National Institute of Mental Health, Bangalore.)

**Results:**

**Table 5:** Result of statistical analysis in both the groups and between the groups:

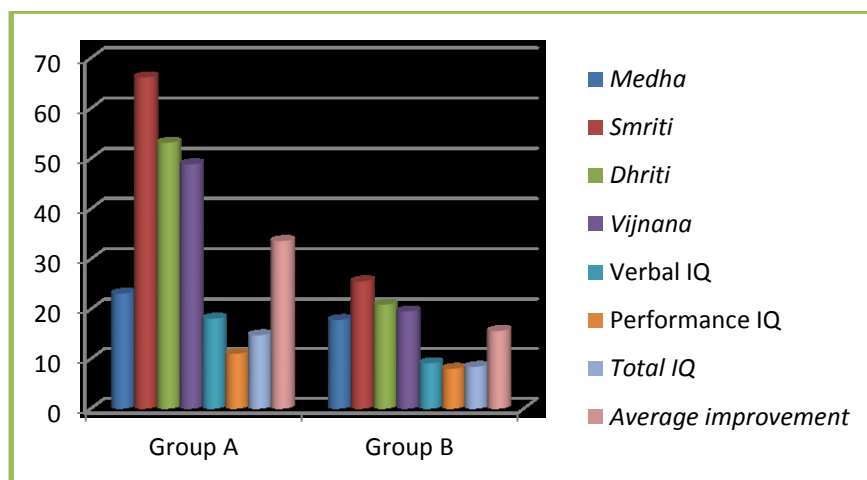
Parameters	p value		
	Group A	Group B	Between Groups
<i>Medha</i>	0.016 (S)	0.003 (S)	0.453
<i>Smriti</i>	<0.001 (HS)	<0.001 (HS)	<0.001 (HS)
<i>Dhriti</i>	<0.001 (HS)	0.002(S)	<0.001 (HS)
<i>Vijnana</i>	<0.001 (HS)	0.032(S)	0.012(S)
Verbal IQ	<0.001 (HS)	<0.001 (HS)	0.002 (S)
Performance IQ	<0.001 (HS)	<0.001 (HS)	0.170 (NS)
Total IQ	<0.001 (HS)	<0.001 (HS)	0.003(S)

**Table 6:** Percentage of improvement in group A and group B:

Characteristics	Group A			Group B		
	Mean Score		%	Mean Score		%
	BT	AT		BT	AT	
Medham Grahanena	1.333	1.733	23.08%	1.233	1.5	17.8%
Smritim Smaranena	0.666	1.966	66.12%	1.166	1.566	25.54%
Dhriti Alaulyena	1	2.133	53.11%	1.266	1.6	20.87%
Vijnanam Vyavasayena	0.733	1.433	48.84%	0.966	1.2	19.5%
Verbal IQ	82.833	101.1	18.06%	85.593	94.166	9.10%
Performance IQ	85.233	95.786	11.01%	88.64	96.336	7.98%
Total IQ	83.966	98.466	14.72%	87.03	94.97	8.36%
Average % of Improvement	33.56%			15.59%		

Percentage of improvement on *Medha* is 23.08%, *Smriti* is 66.12%, *Dhriti* is 53.11%, *Vijnana* is 48.84%, verbal IQ is 18.06%, performance IQ is 11.01% and total IQ is 14.72%. Percentage of improvement on *Medha* is 17.8 %, *Smriti* is 25.54%,

*Dhriti* is 20.87%, *Vijnana* is 19.5%, verbal IQ is 9.10%, performance IQ is 7.98% and total IQ is 8.36%. Average percentage of improvement in Group A is 33.56% and in Group B is 15.59%.



## DISCUSSION

**Probable mode of Action of Guduchyadi syrup:** All the drugs are having *Tikta Rasa* predominantly. *Apamarga*, *Vidanga* and *Vacha* are having *Katu Rasa* along with *Tikta*. Other than *Tikta Rasa*, *Guduchi* is having *Kashaya Rasa*, *Kushta* is having *Madhura* and *Katu Rasa* and *Shatavari* is having *Madhura Rasa*. *Haritaki* is having *Pancharasa* with *Kashaya* as *Pradhana Rasa*. *Sharkara* which is *Madhura Rasa Pradhana*. Almost all the drugs are *Ruksha*, *Laghu* and *Tikshna*; few are *Guru* and *Snigdha*. All drugs are having *Ushna Virya* other than *Shankhapushpi*,

*Shatavari* and *Sharkara*. Among the 9 ingredients, five are having *Madhura Vipaka* and four are having *Katu Vipaka*. *Shankhapushpi* and *Vacha* are having *Prabhava* as *Medhya*. *Guduchi*, *Shankhapushpi* and *Haritaki* are *Tridosha Shamaka* and remaining drugs are predominantly *Kapha Vata Shamaka*.

Almost all drugs are having *Pachana* and *Deepana* property which acts on *Koshta* level and helps for *Srotoshodhana*. All drugs are having *Rasayana* effect on body and are considered to be having direct action on *Medha*. *Rasayana* acts at the level of *Agni*, *Dhatu* and *Srotas*. As the functions of *Sharira* and *Manas* are

interrelated proper functioning of whole body is important to develop the *Buddhi*, *Medha* etc. While considering *Medhya Rasayana* it also acts on body same as any of the *Rasayana*.

- *Agni* – Proper functioning of *Jataragni*, *Dhatvagni*, *Bhutagni* are important for proper functioning of *Dosha*, *Dhatu*, *Indriya* and *Manas*. *Bhutagni* helps for nourishment of *Indriyas*.
- *Dhatu* – *Rasaraktadi Dhatus* which are getting *Poshana* is important for the functioning of *Hrudaya* and *Mastishka*.
- *Srotas*: *Sharira Srotas* as well as *Manovaha Srotas* which are healthy will nourish *Dhatu* and *Indriyas* and hence results in proper perception of Knowledge.

*Medhya Rasayana* act at different levels based on *Rasa Panchaka*, i.e.

- *Sita Virya* and *Madhura Vipaka* – promotes *Dharana Karma*.
- *Ushnavirya*, *Tiktarasa* – Promotes *Sadhaka Pitta* which act on *Buddhi*, *Medha*, *Grahana* and *Smarana* and also improves *Pachakagni*.
- *Tikta Rasa* – Due to *Akasha* and *Vayu Mahabhuta* predominance, cause *Srotovishodhana* by which acts on *Medha*.
- *Sita Virya*, *Madhura*, *Tikta*, *Kashaya Rasa* – *Indriya Prasadana* and helps in *Vishayagrahana* and *Ekagrata* of *Manas*.
- *Ushna Virya*, *Laghu*, *Tikshna*, *Ruksha Guna* – removes the obstruction by *Kapha* or *Tamoguna* in *Manovaha Srotas*.
- *Ushna virya* – promotes *Sadhaka Pitta* which is responsible for proper *Buddhi* and *Medha* and also eliminates *Kapha* and *Tamas* from *Hrudaya*.
- *Madhura Rasa* is having *Sarvendriya Prasadaka* property, which helps for *Jnanaprapti*.<sup>4,5</sup>

#### **Probable mode of action of Placebo:**

- Placebo effect involves a complex neurobiological reaction that includes everything from increase in feel good neurotransmitters, like Endorphin and dopamine, to greater activity in certain brain regions linked to moods, emotional reactions and self – awareness. All of it can give therapeutic benefit.

- Environmental and psychosocial factors are said to influence placebo effects are verbal suggestions, expectations, conditioning reward, reduction of anxiety and behaviors and attitudes manifested by health care providers
- Better response is seen in children compared to adults because the children's dependence on and trust in adults may render them particularly receptive to the doctor's assurance, encouragement and positive prognosis – elements of the treatment situation that contribute substantially to the placebo group.<sup>6</sup>

#### **CONCLUSION**

Based on the statistical study, it can be concluded that *Guduchyadi* syrup is having significant effect on *medha* (23.08%) and highly significant effect on *Smriti* (66.12%), *Dhriti* (53.11%), *Vijnana* (48.84%), Verbal IQ (18.06%), Performance (11.1%) and Total IQ (14.72%). The main action of *Guduchyadi* syrup is at the level of *Sadhaka Pitta* which influences the *Buddhi* and *Medha*. It also possesses *Agnivardhaka*, *Dhatuposhaka* and *Srotoshodhaka* properties. After analyzing the data, it can be concluded that the effect of *Guduchyadi* syrup is statistically highly significant with a p value <0.001 and there is a significant percentage of improvement, which is on the higher side compared to placebo effect.

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