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Evaluation of Efficacy of Gambhari Phala Churna on Satva

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ABSTRACT

Gambhari, an essential component of Dashamuala dravya is termed to be Rasayana dravya, medhya activity has been related to its fruits, which are edible in nature. Memory enhancing effect of Gambhari phala has been evaluated clinically on school children belonged to different socio-economic status. The children were grouped and administered with Gambhari phala churna granules 5 gm once daily at morning and Placebo powder 5 gm respectively once daily at morning the children were advised to follow the diet for 90 days and follow up period set for 90 days. Efficacy of Gambhari phala churna was assessed using parameters mentioned in Charaka samhita Vimana sthana 8th chapter i.e Rogabhishagajitiya adhyaya and results were compared with placebo group using SPSS statistical tool. Significant improvement were noticed among Gambhari phala churna treated group with respect to all the parameters, hence Gambhari phala churna on satva is established scientifically w.s r. to memory promoting activity.

Keywords: Dashamula, *Gmelina arborea*, Memory, Satva.

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INTRODUCTION

Traditional medicine happens to be most neglected as well as less explored areas of life sciences and Ayurveda is not exceptional for this. Modernization undoubtly affected every aspect of life including life style modification. Increased distance between nature and human being is one of the consequences of modernization, which has lead to its own complication and miseries, due to the advent of modern medicine, infectious diseases have become very easy areas for treatment. Modern medicine acquired the seat of conventional health care system since few decades, but limited treatment modalities as well as resources remained major hurdle for treating many disorders including cognitive deficits. Natural products so far remains unchallenged as cognitive enhancers, which have remarkable therapeutic value. Even though many plant products are termed to be having efficacy on cognition, there are very few of them used in real practiced. Many of them still remained under dark because of less exploration. Bringing such drugs in to public domain will definitely have major impact on pharmaceutical industry.

Cognition deficit is one among such conditions affecting present generation especially young and old aged people, such phenomena have necessitated for returning back to nature by using natural products as primary line of disease management. Explorations of novel products for cognitive deficits are of great demand worldwide. Gambhari phala is one such forgotten treasure, which is one among madhura triphala and consisting beneficial neutraceutical value. Gambhari is considered to be a medhya[1] and also one of the best vatahara dravya [2,3]. Fruits of Gambhari are edible one, which can be conveniently used in variable forms for consumption. Present study is intended for evaluating role of Gambhari phala on Satva using parameters mentioned by charaka samhita vimanasthan 8th chapter.

MATERIALS AND METHOD

Procurement of drug used for present study:

Botanically identified *Gambhari* fruit was collected from area surrounding Gadag, Dharawad and Shirasi.

Preparation of samples:

Gambhari fruits were dried in shade and made into coarse powder in Dept of Rasashastra , Post Graduate studies and research centre, JSS Ayurveda medical college, Mysore.

Assessment Methodology of Satva :

The present clinical study “Memory enhancing effect of Gambhari phala churna in school children- a clinical study.” Total 120 children were included. All the children were assessed before and after treatment. Both subjective and objective changes were recorded

according to the case sheet. The data was collected and the discussion that can be made on this study is as follows,

Power to tolerate the disease:

Central tolerance is the mechanism by which newly developing T cells and B cells are rendered non-reactive to self. The concept of central tolerance is general theory of immunity and tolerance, it is hypothesized that it is the age of the lymphocyte that defines whether an antigen that is encountered will induce tolerance, with immature lymphocytes being tolerance sensitive. Self-tolerance via lymphocyte development was a major conceptual contribution to immunology. Central tolerance is distinct from periphery tolerance in that it occurs while cells are still present in the primary lymphoid organs (thymus and bone-marrow), prior to export into the periphery, while peripheral tolerance is generated after the cells reach the periphery. Regulatory T cells can be considered both central tolerance and peripheral tolerance mechanisms, as they can be generated from self (or foreign)-reactive T cells in the thymus during T cell differentiation, but they exert their immune suppression in the periphery on other self(or foreign)-reactive T cells.

Susceptibility to Fear and Grief:

It is mental health condition, that affects the day-to –day life. To analyse all potential out comes, remove the fear by considering all of the potential out comes of decision. Learn to think more positively, positive thinking is an incredibly powerful way to build self confidence and neutralize self –sabotage. In some cases, the case scenario may be genuinely disastrous and it may be perfectly rational to fear failure. In other cases, the worst case may actually not be that bad and recognizing this can help. Have a contingency plan If a person is afraid of falling at something, having a plan that can help feel more confident about moving forward.

Some of the symptoms fear of failure are reluctance to try new things or get involved in challenging projects, self – sabotage, low self esteem or self confidence and perfectionism – a willingness to try only those things you will finish perfectly and successfully.

Sight of Blood/Terrifying situation:

The term is technically used in psychology for the process of reviving the mind, percepts of objects formerly given in sense perception. Since this use of the term conflicts with that of ordinary language and it is fundamental to integrate experience and the learning process.

Facing the terrifying situation is psychological phenomenon in which a person repeats a traumatic event or its circumstances over and over again. This includes reenacting the event or putting oneself in situations where the event is likely to happen again. This "re-living" can

also take the form of dreams in which memories and feelings of what happened are repeated, and even hallucination.

Execution to any new work:

This involves execution of verbal and nonverbal tasks—such as reasoning and comprehension—and makes them available for further information-processing. It can be partly distinguished from short term memory, it includes subsystems that store and manipulate visual images or verbal information, as well as a central executive that coordinates the subsystems. It includes visual representation of the possible moves, and awareness of the flow of information into and out of memory, all stored for a limited amount of time. The cognitive processes needed to achieve this include the executive and attention control of short-term memory, which permit interim integration, processing, disposal, and retrieval of information. It is associated with cognitive development, it is a theoretical concept central to both cognitive psychology and neuroscience. In addition, neurological studies demonstrate a link between working memory and learning and attention.

Carrying out any Activity:

It enables consciousness, perception, thinking, judgment, and memory. A long tradition of inquiries in philosophy, religion, psychology and cognitive science has sought to develop an understanding of what mind is and what are its distinguishing properties. Whatever its relation to the physical body it is generally agreed that mind is that which enables a being to have subjective awareness and intentionality towards their environment, to perceive and respond to stimuli with some kind of agency and to have consciousness, including thinking and feeling. The concept of mind is understood in many different ways by many different cultural and religious traditions. Some see mind as a property exclusive to humans whereas others ascribe properties of mind to non-living entities.

Friendship:

It is a suggested cognitive limit, to the number of people with whom one can maintain stable social relationships. These are relationships in which an individual knows who each person is, and how each person relates to every other person. The number of people one knows and keeps social contact with, and it does not include the number of people known personally with a ceased social relationship, nor people just generally known with a lack of persistent social relationship, a number which might be much higher and likely depends on long-term memory size. "This limit is a direct function of relative neocortex size, and that this in turn limits group size, the limit imposed by neocortical processing capacity is simply on the number of individuals with whom a stable inter-personal relationship can be maintained." On

the periphery, the number also includes past colleagues such as high school friends with whom a person would want to reacquaint them self if they met again.

Diet preferred:

It has to be applied wholly – from knowledge to mind's practical application, to food, to physical exercise to meditation to devotion – to have a holistic benefit. The Indian seers and rishis knew and documented the effects of food on human body and mind. In the traditional Indian context, food is not divided into vegetarian, non-vegetarian, lacto-vegetarian, ovo-lacto-vegetarian or vegan. It is classified into three categories based on the three *gunas* (characteristics/properties): Sattvic foods: foods, which are pure, fresh, light, easy to digest, and are bliss to the body and mind. Like some grains, legumes, certain fresh vegetables, fruits and nuts, milk and some milk products. Sattvic diet is considered the best for a healthy, light body and a calm mind – preferred by yogis. Rajasic foods: foods that stimulate the body and mind, and incite passion and aggression. Like strong spices, salt, certain grains, sour cream, coffee, tea and deep-fried foods. Tamsic foods: foods that are heavy, rotten and make the body and mind dull, inert. Like alcohol and all kinds of animal flesh. Leftovers are tamsic too!

Memory:

In psychology, memory is the process in which information is encoded, stored, and retrieved. Encoding allows information that is from the outside world to reach our senses in the forms of chemical and physical stimuli. In this first stage we must change the information so that we may put the memory into the encoding process. Storage is the second memory stage or process. This entails that we maintain information over periods of time. Finally the third process is the retrieval of information that we have stored. We must locate it and return it to our consciousness. Some retrieval attempts may be effortless due to the type of information.

RESULTS AND DISCUSSION:

Power to tolerate the disease:

It was observed that there was quantal response in this particular parameter. This observation among the children is supported by experimental findings observed in Guinea pigs and Swines, suggesting improvement in leucocytes, lymphocyte and neutrophil count in Guinea pigs and Swines fed with *Gmelina arborea* fruits meal diet[4,5]. The research suggests improved lymphocytoic count in Guinea pigs fed with *Gmelina arborea* fruits meal diet related is to nutritive value. And also research findings were only suggestive of improvement in cell mediated immunity without much significant change in blood glucose level, total lipids value, blood urea, nitrogen , serum creatinine and other enzymatic parameters .

Hence Power to tolerate the disease by *Gmelina arborea* fruits can be attributed to nutritional value which improves cell mediated immunity.

2) DATA RELATED TO EFFECT OF THERAPY

Table 1: showing the objective parameter grading of Power to tolerate the disease before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	90	50	98	54.44
	AT	90	50	98	54.44
	AF	90	50	98	54.44

Table 2: showing the objective parameter grading of Susceptibility to Fear and Grief before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	90	50	98	54.44
	AT	90	50	98	54.44
	AF	90	50	98	54.44

Table 3: showing the objective parameter grading of Sight of Blood / Terrifying situation before , after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	90	50	82	45.55
	AT	90	50	82	45.55
	AF	90	50	82	45.55

Table: showing the objective parameter grading of Execution to any new work before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	88	48.89	82	45.55
	AT	130	72.22	105	58.33
	AF	130	72.22	105	58.33

Table: showing the objective parameter grading of Carrying out any Activity before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	90	50	83	46.11
	AT	140	77.78	110	61.11
	AF	140	77.78	110	61.11

Table: showing the objective parameter grading of Friendship before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	107	59.44	95	52.78
	AT	108	60.00	101	56.11
	AF	108	60.00	101	56.11

Table: showing the objective parameter grading of Diet preferred before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	115	63.89	115	63.89

	AT	130	72.22	115	63.89
	AF	130	72.22	115	63.89

Table: showing the objective parameter grading of Memory before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	85	47.22	80	44.44
	AT	140	77.77	101	55.55
	AF	140	77.77	101	55.55

Table: showing the objective parameter grading of Satva evaluation score before, after treatment and follow up in group A

No. of Children		Group A	%	Group B	%
60	BT	746	51.80	730	50.69
	AT	883	61.32	809	56.18
	AF	880	61.11	809	56.18

Table: showing the objective parameter grading of Satva before, after treatment and follow up in group A

No. of Children		Avara satva	%	Madyama satva	%	Pravara satva	%
60	BT	17	28.33	43	71.66	Nil	0
	AT			57	95	3	0.05
	AF			57	95	3	0.05

Table: showing the objective parameter grading of Satva before, after treatment and follow up in group B

No. of Children		Avara satva	%	Madyama satva	%	Pravara satva	%
60	BT	37	61.66	23	38.33	Nil	0
	AT	20	31.33	40	66.66	Nil	0
	AF	20	31.33	40	66.66	Nil	0

GRADING FOR ASSESSMENT OF THE SATVA

Power to tolerate the disease

Good Power to tolerate the disease and pain/ No recurrent infections even change in climatic conditions -03

Tolerate the disease and pain/ Infections only change in climatic conditions -02

Doesn't sustain the disease and pain/ Infections without change in climatic conditions -01

Susceptibility to Fear and Grief

Tolerate the fear and grief/ strong -03

Occasionally expresses about the fear and grief/Medium -02

Expresses instantly about the fear and grief/Mild -01

Sight of Blood/Terrifying situation

Handles all the situations/ strong -03

Handles only soft situations and not difficult one /Medium -02

Unable to handle the soft situations/Mild -01

Activity

a) Carrying out any Activity

Normal fast with good activity	-03
Very quick with medium activity	-02
Very slow and poor activity	-01

b) Execution to any new work

Plan well today only and execute properly	-03
Simply plans and execute immediately	-02
Delay in planning and execution of the work	-01

Friendship

Popular, smooth and cordial	-03
Very popular often ends with disputes	-02
Less popular and less friends	-01

Diet preferred

Milk, Ghee and freshly prepared foods	-03
Meat, spicy and hot foods	-02
Fresh, curd and cold foods	-01

Memory

Long term memory	-03
Short term memory	-02
Very poor memory	-01

GRADING SCORES

Avara Satva	-Within 12 points
Madhyama satva	-Above 12 and below 18
Pravara satva	- Above 18

Susceptibility to Fear and Grief, Sight of Blood/Terrifying situation, Execution to any new work, carrying out any Activity and Friendship:

Incidentally Susceptibility to Fear and Grief, Sight of Blood/Terrifying situation no change was elicited probably these being psychological qualities. However Execution to any new work, carrying out any Activity and Friendship graded response was recorded in the present study.

Above told parameters are also mentioned as sign and symptoms of Psychiatric disorder named as Attention deficit disorder , which affects about 6-7 % of children when diagnosed by DSM-IV Criteria[6] and 1-2 % which diagnosed ICD-10 criteria. Attention deficit disorder is diagnosed approximately 3 times more frequently in boys than in girls.

Academic difficulties are frequent with the problems with relationships; symptoms are difficult to define sometimes, related to in attention hyperactivity and impulsivity. Frequently observed sub types of Attention deficit disorder comprise difficulty in focusing attention, organizing and completing a task, learning new methods or new tasks, completing a task as homework assignments and forgetfulness. Social behaviours like skills, social interaction, forming and maintaining friendships and difficulty in learning languages may negatively affects social interaction[7].

Associated condition with Attention deficit disorder comprise academic skill disorder, anxiety disorder have been found to be more common and restless leg syndrome. Pathophysiology of Attention deficit disorder involves certain changes in the brain architecture especially left sided pre-frontal cortex and reduction in the brain volume.

Treatment modality of Attention deficit disorder include dietary modifications by supplementation of certain minerals like zinc, iron, magnesium, iodine and certain fatty acids and amino acids. Especially zinc is proved to be one of the important supplement needed in Attention deficit disorder[8]. Above mentioned minerals along with essential amino acids are detected and confirm to be of high grade present in Gambhari phala as per FAO/ WHO standards, which corroborates with dietic and nutritional supplementation in Attention deficit disorder[9].

Memory:

All the children undergoing trial with Gambhari phala churna clearly showed improvement in memory power. Learning and memory process are the important factors of cognition related with neurons and associated parts of central nervous system. Recently the ability of food to prevent and protect against diseases has created to become recognized , mainly in relation to effect of nutrients on molecular process within the body[10].

Certain cells require particular nutrients to play specific roles in order to function properly and neurons also do have the same nature. Insufficient intake of selected vitamins and nutrients may affect cognition process by disrupting nutrient dependent processes that are associated with management of energy in neurons. This results into subsequent change in synaptic plasticity or to ability to encode new memories. Dietic management in cognition deficit comprises supplementation of high grade proteins, essential amino acids, vitamins, minerals, magnesium and iron is proved to be having active role in enhancing cognition by improving attention. Essential amino acids and fatty acids do take active role in structural and functional aspects of neurons for example; lysine and choline there by helping ability to encode new memories[11].

Gambhari phala is analyzed and proved to be having high crude protein 16.2%, High calorfic value 106.7 k.cal /kg , eleven essential amino acids of very high grade zinc, copper, iron, magnesium and calcium as per FAO/ WHO standards. Memory process is an essential part of cognition merely dependent on nutritional and social status of an individual, especially with respect to vitamin B, proteins, iron, vitamin A and C, Magnesium and zinc are highly significant[12].

All the above said nutritional factors play highly significant role in energy management by neurons , hence memory enhancing activity can be strongly attributed to the nutritional components present in Gambhari phala. These happens to be important nutrients. Among the others in development of behavioural and structural growths during child hood. Important nutrients are needed for memory development are choline and associated first class amino acids , vitamin B group (B_1, B_3 , B_9 and B_{12}) as well as folic acid, Vitamin A and C associated with minerals like zinc and magnesium are very vital in cognitional and behavioural developments[13], hence can considered as a very good source of nutrition during child hood.

Diet preferred:

Pathya comprising of satvika ahara was advised, which was commonly followed by all children to a majority of extent providing the uniform base with respect to diet.

Among wholesome and unwholesome diet few substances have been given relatively more importance such as dugdha, gritha, madhu, takra, sharkara, guda and draksha, which may be because of their satvika /jeevaniya/brihmaniya/balya guna karma. Gambhari phala mentioned in phala varga has been regarded as pratinidhi dravya for draksha according to Bhavaprakash, which is readily and easily available, collected and consumed by even any strata of population without any expenditure. Since Gambhari phala has got similar food and medicinal value as that of draksha and even specific karmas like rasayana, medhya, and keshya are ascribed classically can be considered as the diet preferred by any individual belonging to different socio-economic status.

CONCLUSION:

120 children diagnosed of below average according to WISC IV and those willing to participate in the clinical study were selected incidentally, irrespective of age, caste, religion based on inclusion and exclusion criteria. Children were subjected for preliminary examination and lab investigations for Hb% before treatment. The chart of grading of subjective parameters along with individual proforma for precise grading of the parameters were standardized and utilized clinically. After preliminary examinations and with a written consent, the children were grouped and administered with Gambhari phala churna granules 5

gm once daily at morning and Placebo powder 5 gm respectively once daily at morning the children were advised to follow the diet and also to discontinue the medicine in case of any discomfort and to report immediately. The children were again subjected for the examination for reassessing the response of the 'Satva' i.e. after 90th days of medication and were advised for180 days follow up without any medication. The data was collected at the end of the follow up. In the present clinical study overall response during the time of treatment, at the end of the treatment and follow up for the assessment of Satva, there were significant improvements in parameters like memory, Execution to any new work and carrying out any activity levels in the study group than in control group. Hence the role of Gambhari phala churna as medhya can be substantiated.

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