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EFFICACY OF JATAMANSI CHURNA IN THE MANAGEMENT OF ATTENTION DEFICIT HYPERACTIVE DISORDER IN CHILDREN, A RANDOMIZED CONTROL CLINICAL STUDY

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ABSTRACT

Background:- Attention Deficit Hyperactivity Disorder (ADHD) is a common neurobehavioral disorder of childhood punctuated with unacceptable behaviour.[1, 2] The prevalence of ADHD in primary school children was found to be 11.32%. Prevalence is higher in the males (66.7%) as compared with females (33.3%). In classical text book scattered reference of Medya Rasayan in the condition of psychiatric disorders) these are more effective. The drug Mandukaparni and Jatamansi churna was thus selected for the present study following the concepts of Medhya rasayana in management of ADHD along with Feingold diet and Sadavruth Palan. Therefore this study has been undertaken.

Methodology - A Randomized controlled clinical study was planned to evaluate the efficacy of Jatamansi and Mandukaparni churna with Anupan Madhu,Feingold diet and Sadvrittapalan should be advise in ADHD children who were diagnosed using DSM-IV scale. Subject Identification from various schools is selected and those children's fulfilled DSM-IV criteria and included in the study. 156 children's are grouping into two groups in Group A Mndukaparni churna and Group B Jatamnsi Churna with AnupanMadhu along with

Feingold diet and Sadavruth Palan should be advise to children's for 30 days. Before treatment and after treatment assessment should be done with DSMIV criteria

Results: The changes in hyperactivity-impulsivity criteria reached statistically highly significant Levels ($p<0.0001$***), also some relief was seen in symptoms of hyperactivity-impulsivity clinically. Though Clinically relief was found in criteria of inattention statistically results were significant ($p<0.0233$*). The results in criteria for hyperactivity were highly significant ($p<0.0001$***) in Mandukaparni group and significant ($p<0.0150$*) in Jatamansi group clinically as well as statistically.

Conclusion: The drug Mandukaparni and Jatamansi churna was thus selected for the present study following the concepts of Medhya rasayana in management of psychiatric disorders. Mandukaparni churna provided highly significant results in improving the inattention which indicates the capacity of the drug in improving attention and concentration.

Keywords: ADHD, Hperactivity, Sadhavrith palan, Feingold diet, Mandukaparni, Jatamansi

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a common neurobehavioral disorder of childhood punctuated with unacceptable behaviour.[1, 2] it is a frustrating disorder and has turned out to be a rampant problem in the society as it leads to great deal of psychological and behavioural distress to the child, parents and the family members. It has the highest incidence among the developmental disorders in India about 7.5-10 % children's. The prevalence of ADHD in primary school children was found to be 11.32%. Prevalence is higher in the males (66.7%) as compared with females (33.3%). children with ADHD often engage in disruptive activities and antisocial behaviour that affects badly people around them. In addition, their academic performance tends to suffer because of their inattention and easy distractibility. ADHD is chronic neurological conditions resulting from a persisting dysfunction within the central nervous system and are not related to gender, level of intelligence or cultural environment. ADHD is behavioural disorder marked by an improper inattention and/ hyperactivity-impulsivity that get involved in with functioning or development. Inattention means a person wanders off task, lacks of constant mind, has difficulty to sustaining focus and is not properly plan; and these problems are not due to defiance or lack of comprehension. Hyperactivity means a person move constantly, including in appropriate situations or excessively squirm, taps or excessive talks. It may be extreme

restlessness. Impulsivity means a person makes quick actions that occur in the moment without thinking about them and that may have high potential for harm or a desire for immediate rewards. In Ayurveda all so giving more important to Patya (diet) while treating diseases so here we should adopted Feingold diet chart. Feingold diet is a type of exclusion diet which requires the individual to avoid artificial additives and salicylates is intended to reduce or eliminate ADHD symptoms in children.[5] while treating behavioural disorder behaviour theory play an impotent role so in behaviour therapy is correlated to Sadhavruth. the description of Sadvritta is mentioned in Charka Samhita very grossly.[6] It is effective along with medication and diet in the management of ADHD. In Ayurveda neither this disease nor the symptoms of ADHD are described but some References about abnormal behaviour are discussed under features of vataprakriti Anavasthita Chittatva Mano vibhrama, Buddh vibhrama, Smriti vibhrama, Sheela vibhrama, Cheshta vibrama and Achara vibhrama can be correlated with ADHD.[7]

Though these terms have been mentioned collectively under the description of Unmada Vyadhi, when considered individually they closely resemble some of the clinical features and associated features of ADHD. According to Ayurveda, the main reason for ADHD is vitiation of these three Dhee, Dhriti, Smriti which causes abnormality and abnormal conduct resulting into improper contact of the senses with their objectives and give rise to inattention, hyperactivity and impulsivity. According to Ayurveda, psychological problems start when fundamental imbalances develop in the biological intelligence that controls all bodily processes. Vata imbalance contributes to anxiety, fear, mental instability and insomnia, Pitta imbalance may give rise to anger and irritability and Kapha imbalance may lead to lethargy and depression. The contemporary systems of medicine have not received any major success in their treatment. However they have various side effects. The benefits are often not sustained, they are sub-optimal and few patients have shown worsening of condition following their administration. ADHD has no direct reference in Ayurveda, but looking at the pattern it can be considered under vata disorders. Multiple numbers of researches have been carried out but till now no potent drug has been found.

The drug selected (Jatamansi) is proved to be effective in enhancing perceptual discrimination and psychomotor performance. It was also effective in

controlling somatic and psychic anxiety.Therefore today there is a need to identify drugs or drug compounds that are safe and effective to help children overcome this problem and reduce the ADHD burden of the society. Therefore this study has been undertaken.

METHODOLOGY A Randomized controlled clinical study was planned to evaluate the efficacy of Jatamansi and Mandukaparni churna individually along with Feingold diet and sadvritta palan in ADHD in school going children's are diagnosed using standard diagnostic criteria i.e. DSM-IV scale.

Inclusion Criteria - Children of either sex between the age group of 5 to 15 year fulfilling DSM- IV criteria for ADHD.

Exclusion criteria: Known cases of any acute or chronic illnesses e.g GE, TB, malignancy and on chronic medication etc and Known cases of seizures, Epilepsy, Bipolar Disorder etc.

Treatment Protocol - Grouping 156 children diagnosed as ADHD through DSM IV were randomly divided into two groups.

Group	Sample	Intervention	Duration	Anupana	Feingold diet & Sdavruth Palan
Group A	78	MandukaParni Churna	30 days	Madhu	
Group B	78	Jatamansi Churna	30 days	Madhu	Feingold diet & Sdavruth Palan

Feingold die:- The Feingold Diet was created by Dr. Benjamin Feingold, a Californian pediatrician and allergist. According that. artificial colors, sweeteners, salicylates, and three preservatives — butylated hydroxyanisole, butylated hydroxytoluene , and tert-Butrylhdryquinone are eliminating from diet that reduce or eliminate ADHD symptoms in certain children on that base this diet is adopted in the study.

Sadvritta palan The word sadvritta is derived from word sad means good or vita means behaviour or regime. Sadvritta palana is mainly emphasizes on the do's and don'ts that are to be followed for a systematic and healthy lifestyle. In the Samhita, different types of therapy mentioned related to social behaviour, personal behaviour either mentally or Physically related, Sadrvitta can be classified into five groups these are Ethical conduct[8] (vyavaharika sadvritta),Social conduct[9] (Samajika sadvritta), Mental conduct[10](Mansika sadvitta), Moral conduct (dharmika sadvitta), and Physical conduct (sharirika sadvitta) among these five types of sadvritta Palan fist three are related to Mind so these are selected for management of ADHD.

Assessment criteria: Child will be screened first with DSM-IV scale. If 6 or more of the following symptoms of Inattention, Hyperactivity and Impulsivity have been present for at least 6 months then child will be included in the study.

Table 01 - showing Dsm-iv scale for inattentiveness[11]

Criteria for inattentiveness	0	1	2	3
Not giving attention to details or careless mistakes involving school and homework				
Even while playing this is evident				
Does not give attention to listen when spoken to Directly				
Often does not follow instructions and fails to finish schoolwork, duties in the workplace				
Poor in organizing tasks and activities				
Avoids, dislikes or doesn't want to do things that take a lot of mental effort for a long time example: schoolwork or homework				
Losses toys, school assignments, pencils, books etc				
Is easily distracted				
Forgetful in daily activities				
Totals.				

Occurrence	Grade
Never	0
Often	1
Quite often	2
Very often	3

Table 2: Showing DSM-iv scale for hyperactivity and impulsiveness[11]

Criteria's for hyperactivity and impulsiveness	0	1	2	3
Fidgets with hands, feet or squirms in seat				
Running about or climbing on wrong places				
Plays very noisily				
So high on activity				
Loquacity-talking too much				
Starts answering before questions have been finished				
Cannot wait for his turn				
Intrudes in others activity				
Totals.				

Grading of hyperactivity and impulsiveness

Occurrence	Grade
Never	0
Often	1
Quien	2
Verften	3

Table 3: Showing Scoring on the base of percentile chart [12]

In Attentiveness subscale raw score	
Hyperactivity/Impulsiveness subscale raw score	
Total raw score	
In Attentiveness subscale percentile score	
Hyperactivity / Impulsiveness subscale percentile score	
Total percentile score	

Statistical Analysis: Parametric data was analyzed by dependent t test for within the group analysis while significance was tested at a confidence level of 95%.

OBSERVATION

Distribution of patients according to sex wise

In present study majority where male 70 (44%) and while girls are 86 (55%) **(Graph 1)**.

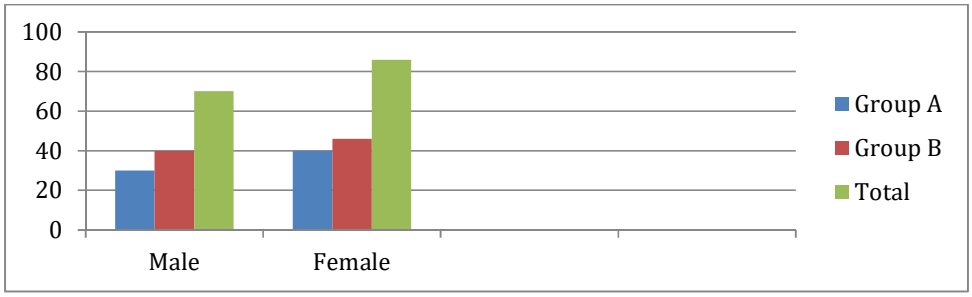
Distribution of patients according to age wise (Table 5; Graph 2)

In the present study 50 (32.0%) patients from the age group of 5 to 8 years, were 80 (51.2%) patients from the age group of 9 to 12 years old and 26 (16.6%) patients from the age group of 12 to 15 year old.

The present study show that maximum 80 (51.2%) of the children in the study Suffered from Mixed type of ADHD. While the other 30 (19.2%) suffered from Hyperactivity impulsivity dominant type of ADHD and 46 (29.4%) of the children in the study suffered from Inattention type of ADHD **(Table 6, Graph 3)**.

Table 4: Showing sex wise destruction of patients in the study

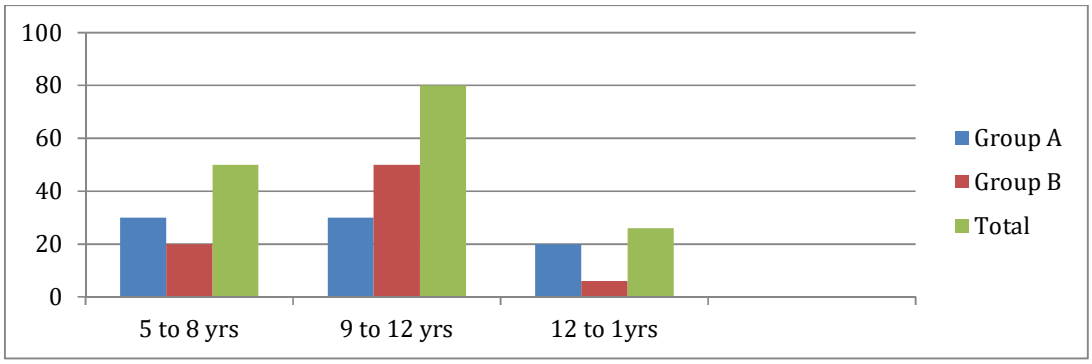
Sex	Group A	Group B	Total	%
Male	30	40	70	44%
Female	40	46	86	55%



Graph 1: Showing sex wise destruction of patients in the study

Table 5: Showing age wise destruction of patients in the study

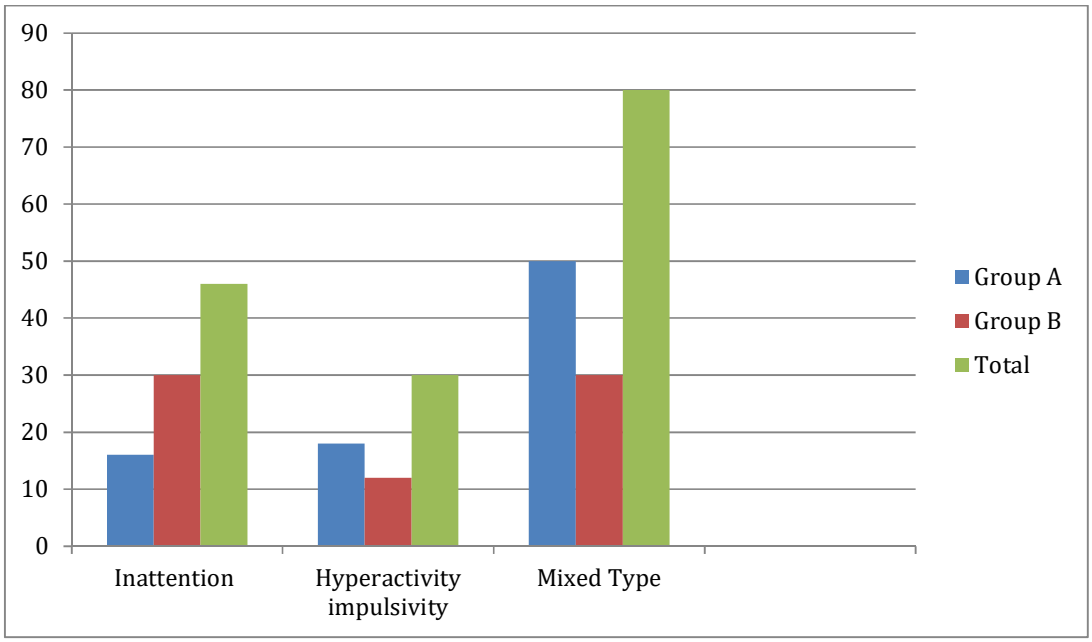
Age	Group A	Group B	Total	%
5 to 8 yrs	30	20	50	32.0
9 to 12 yrs	30	50	80	51.2
12 to 1yrs	20	6	26	16.6



Graph 02: Showing age wise destruction of patients in the study

Table 6: Distribution of patients according to their type of ADHD

ADHD Type	Group A	Group B	Total	%
Inattention	16	30	46	29.4
Hyperactivity impulsivity	18	12	30	19.2
Mixed Type	50	30	80	56.2



Graph 3: Distribution of patients according to their type of ADHD

RESULTS

A significant difference was observed between before treatment (15.73±3.72) and after treatment (14.69±3.25) with Inattention raw scores (t=2.3147, p=0.0233) in Jatamansi group. It means that, the change in relief from before treatment and after treatment on Inattention raw scores was statistically significant in Jatamansi group.

A significant difference was observed between before treatment (16.36±4.06) and after treatment (13.74±3.20) with Inattention raw scores (t=5.6162, p=0.0001) in Mandukaparni group. It means that, the change in relief from before treatment and after treatment on Inattention raw scores was statistically significant in Mandukaparni group.

From the results of **Table 13**, it can be seen that,A significant difference was observed between Jatamansi and Mandukaparni mean difference in raw scores of Inattention (t=-2.4387, p=0.0159) and total (t=2.4421, p=0.0157).But no significant difference was observed between Jatamansi and Mandukaparni groups with mean difference in raw scores of Inattention and total.

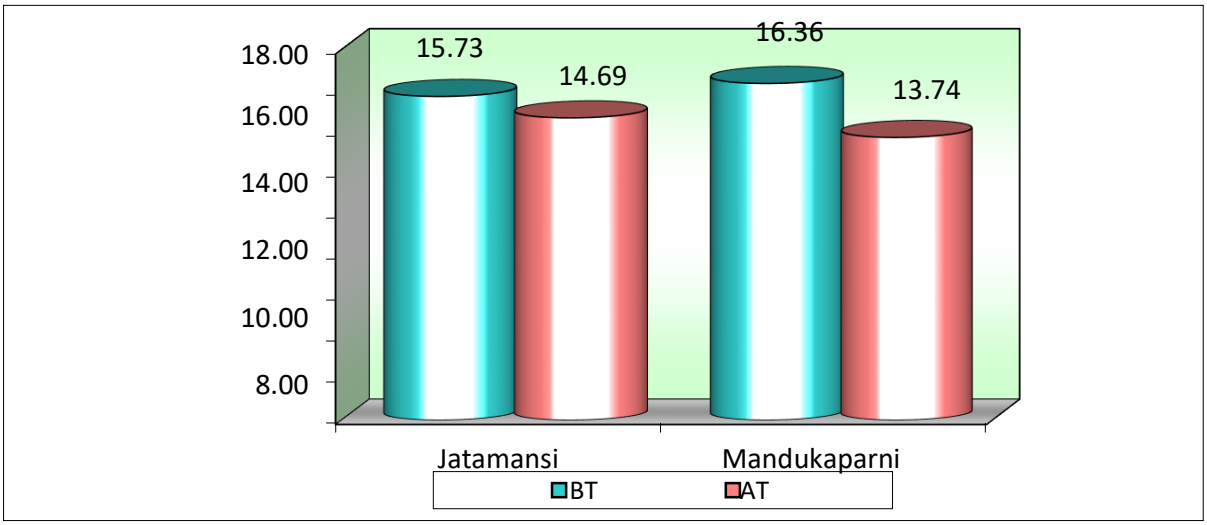
From the results of **Table 14**, it can be seen that, no significant difference was observed between Jatamansi and Mandukaparni groups with mean difference in percentile scores of Inattention, Hyperactivity & Impulsivity and total. In the present dissertation work a total of 154 subjects, completed the treatment, 78 in Group A, 78 in Group B. The treatment was given for one month. The general information about the patients like their age, sex,

socioeconomic status, chief and associated complaints antenatal, post natal history etc has been taken. All the 154 subjects diagnosed with the help of DSM-IV scale used for ADHD. Scores both raw score and in percentile score before and after the treatment were recorded separately in tabular form and finally evaluated statistically. An attempt has been made to discuss each of these observations separately with special reference to their relation with ADHD.

Table 07: Showing Comparison of effect intervention i.e. between before treatment and after treatment Inattention raw scores by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Significant
	Mean	SD	Mean	SD				
Jatamansi	15.73	3.72	14.69	3.25	1.04	2.3147	0.0233	*
Mandukaparni	16.36	4.06	13.74	3.20	2.62	5.6162	0.0001	***

*p<0.05, ***p<0.001

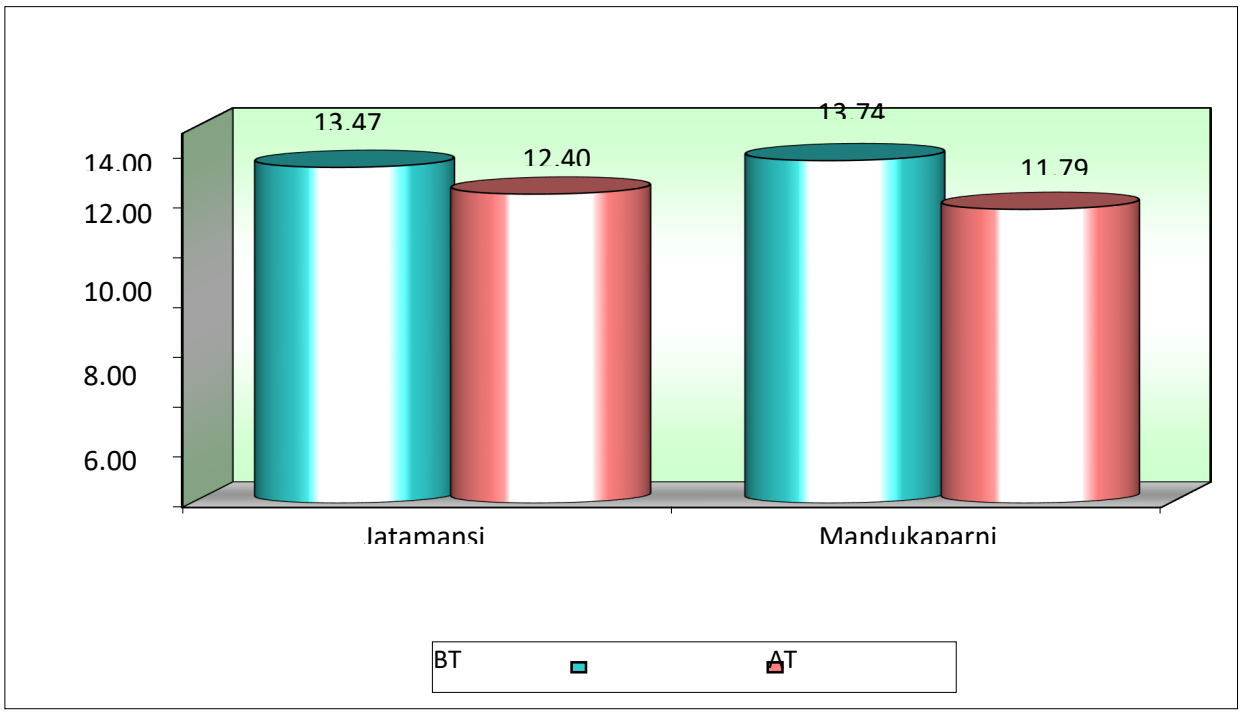


Graph 4: Comparison of effect intervention i.e. between before treatment and after treatment Inattention raw scores

Table 08: Comparison of effect intervention i.e. between before treatment and after treatment Hyper active impulsivity scores by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Signi.
	Mean	SD	Mean	SD				
Jatamansi	13.47	3.87	12.40	4.61	1.08	2.4877	0.0150	*
Mandukaparni	13.74	4.38	11.79	5.04	1.95	4.1954	0.0001	***

*p<0.05, ***p<0.001

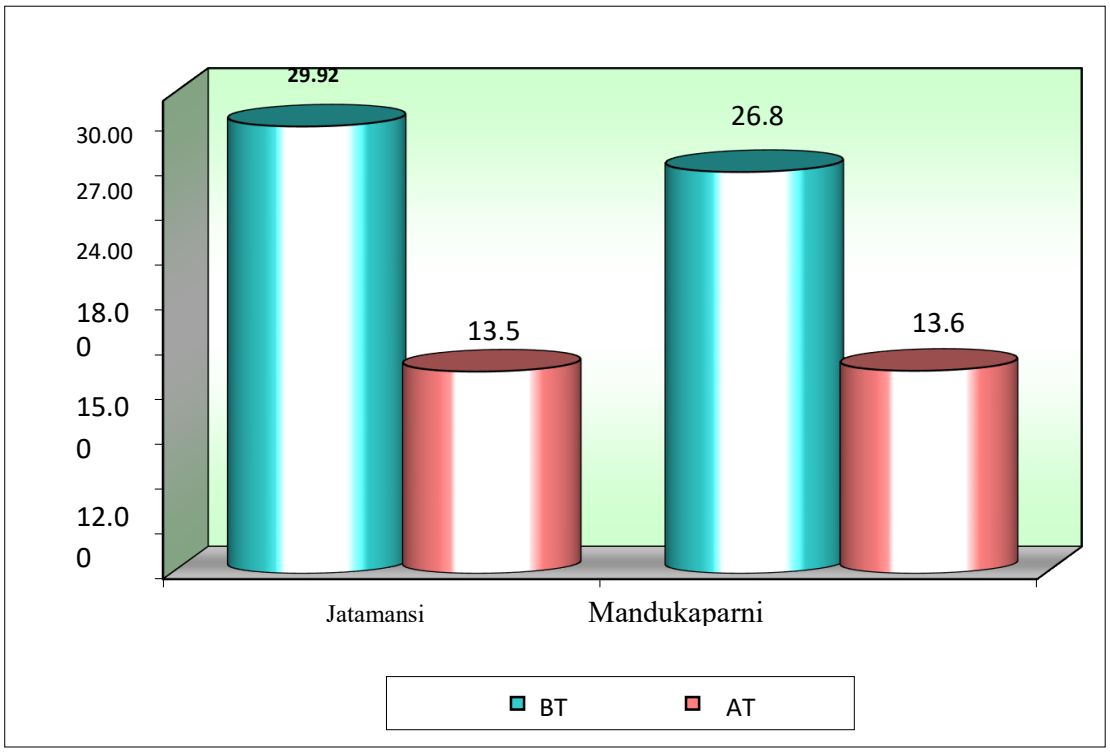


Graph 05: Comparison of effect intervention i.e. between before treatment and after treatment Hyper active impulsivity scores

Table: 09 Comparison of effect intervention i.e. between before treatment and after treatment total scores (overall therapy) by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Signi.
	Mean	SD	Mean	SD				
Jatamansi	29.92	8.21	13.55	5.76	16.37	18.4480	0.0001	***
Mandukaparni	26.88	6.28	13.60	6.64	13.28	14.7292	0.0001	***

***p<0.001

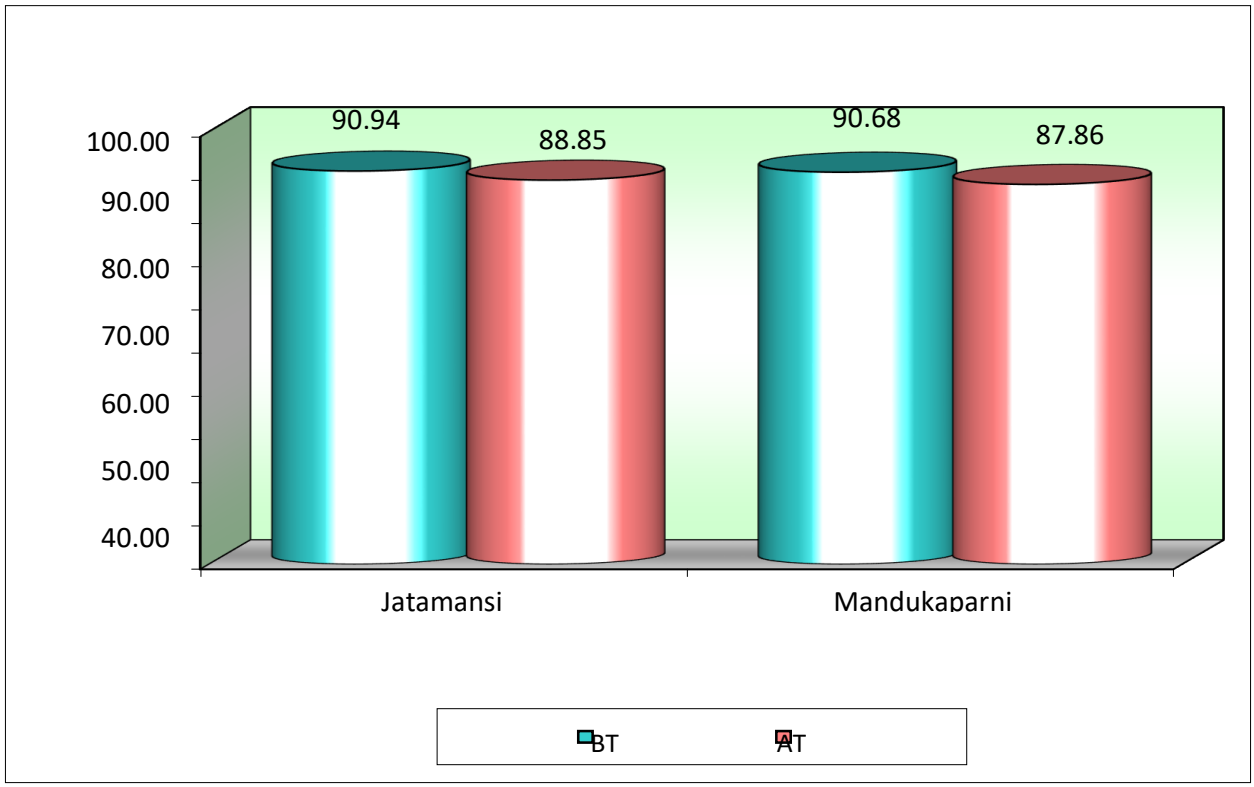


Graph 06: Comparison of effect intervention i.e. between before treatment and after treatment total scores (overall therapy)

Table 10: Comparison of effect intervention i.e. between before treatment and after treatment Inattention Percentile scores by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Signi.
	Mean	SD	Mean	SD				
Jatamansi	90.94	5.20	88.85	5.41	2.09	3.2401	0.0018	**
Mandukaparni	90.68	4.59	87.86	5.39	2.82	4.2741	0.0001	***

P<0.1,p<0.001**

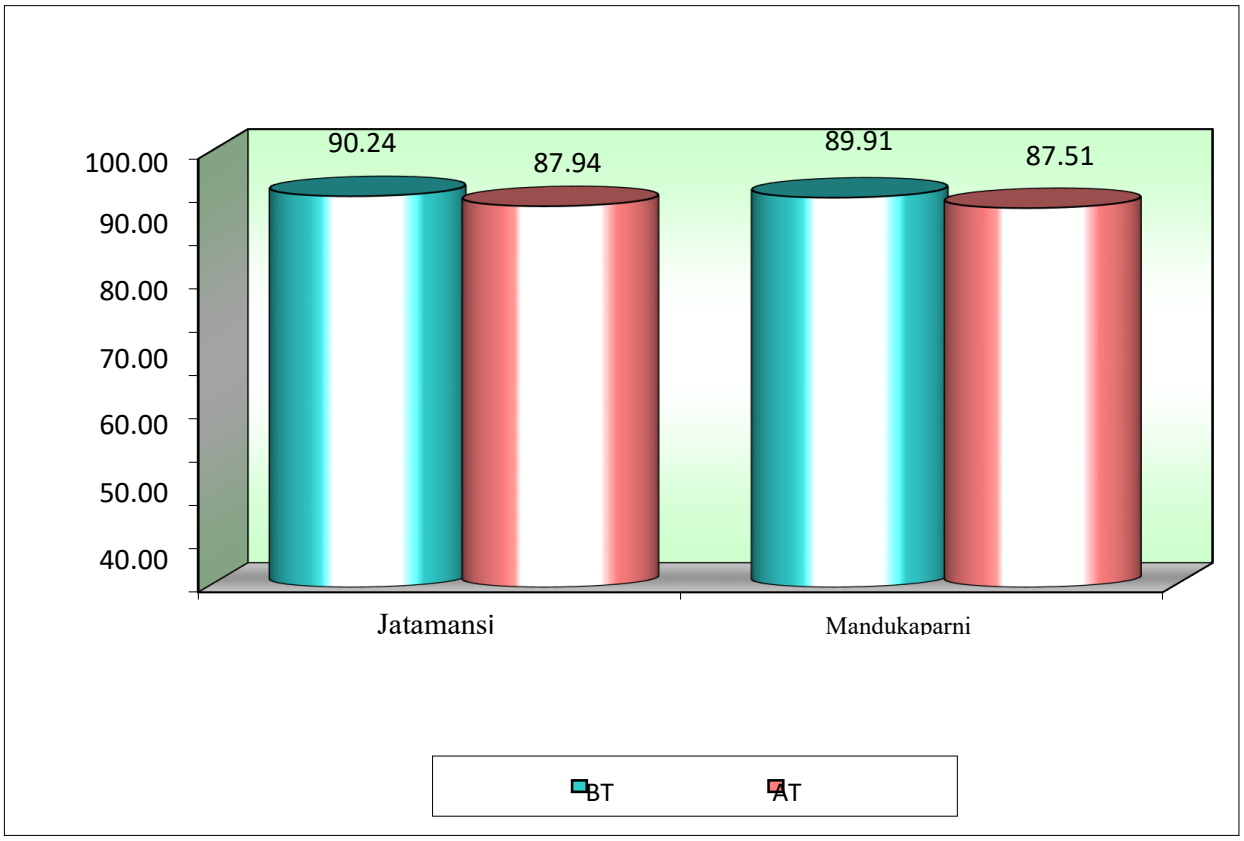


Graph 07: Comparison of effect intervention i.e. between before treatment and after treatment Inattention Percentile score

Table 11: Comparison of effect intervention i.e. between before treatment and after treatment Hyper active impulsivity Percentile scores by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Signi.
	Mean	SD	Mean	SD				
Jatamansi	90.24	5.54	87.94	7.20	2.31	4.8413	0.0001	***
Mandukaparni	89.91	6.09	87.51	7.60	2.40	4.7031	0.0001	***

***p<0.001

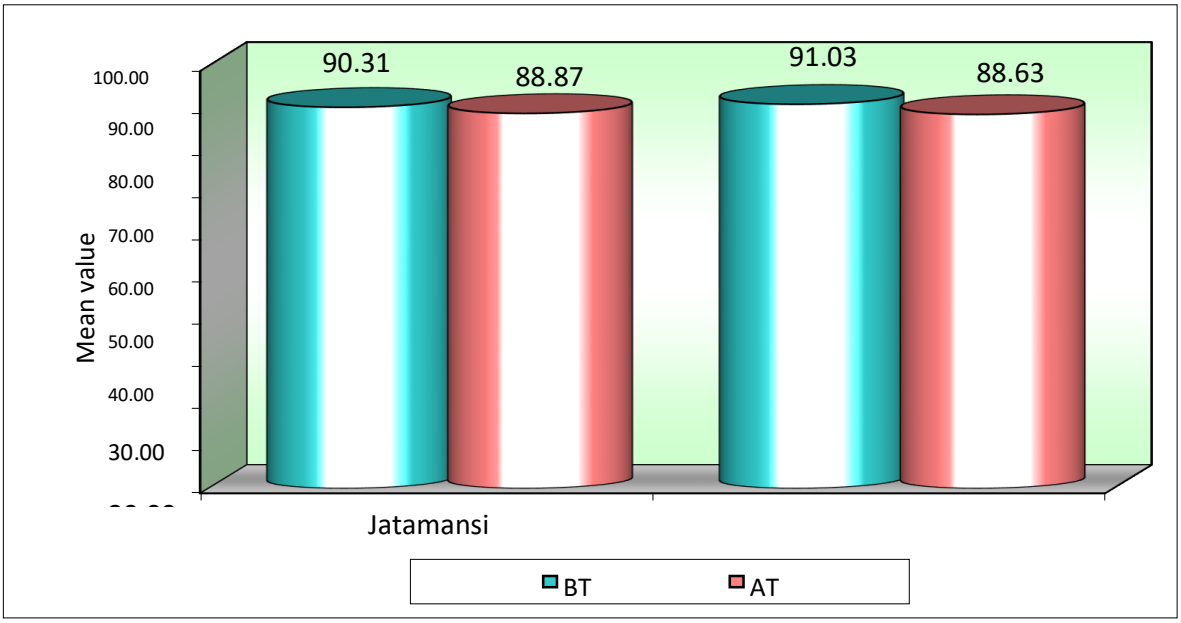


Graph 08: Comparison of effect intervention i.e. between before treatment and after treatment Hyper active impulsivity Percentile scores

Table 12: Comparison of effect intervention i.e. between before treatment and after treatment total Percentile scores (overall therapy) by dependent t test

Groups	BT		AT		Mean Diff	t-value	P-Value	Signi.
	Men	SD	Mean	SD				
Jatamansi	90.31	5.96	88.87	6.07	1.44	1.5941	0.1150	NS
Mandukaparni	91.03	6.15	88.63	6.29	2.40	2.4378	0.0171	*

***p<0.05, **p<0.01**



Graph 09: Comparison of effect intervention i.e. between before treatment and after treatment total Percentile scores (overall therapy)

Table 13: Comparison between the groups with Inattention, Hyperactivity & Impulsivity and total raw scores by independent t test

	Groups	Mean	SD	Diff. mean	t-value	p-value	Significant
Inattention raw	Jatamansi	1.04	3.96	-1.58	-2.4387	0.0159	* S
	Mandukaparni	2.62	4.11				
Hyperactivity & Impulsivity raw	Jatamansi	1.08	3.82	-0.87	-1.3730	0.1717	NS
	Mandukaparni	1.95	4.10				
Total raw	Jatamansi	16.37	7.84	3.09	2.4421	0.0157	*, S
	Mandukaparni	13.28	7.96				

*p<0.05

Table 14: Comparison between the groups with Inattention, Hyperactivity & Impulsivity and total percentile scores by independent t test

Variables	Groups	Mean	SD	Diff. mean	t-value	p-value	Significant.
Inattention percentile	Jatamansi	2.09	5.70	-0.73	-0.7920	0.4296	NS
	Mandukaparni	2.82	5.83				
Hyperactivi & Impulsivity	Jatamansi	2.31	4.21	-0.09	-0.1286	0.8978	NS
	Mandukaparni	2.40	4.50				
Total percentile	Jatamansi	1.44	7.96	-0.96	-0.7210	0.4720	NS
	Mandukaparni	2.40	8.69				

DISCUSSION

Group A - Mandukaparni Churna – Maximum relief was observed in the criteria of **inattention.** The relief was significant (p<0.0001***) and the changes were statistically as well as clinically highly significant. Previous studies also reveal that Mandukaparni had significant action in Attention Deficit Hyperactive Disorder (bhat et al 2006). *Centella asiatica* extract can influence the neuronal morphology and promote the higher brain functions like learning and memory in juvenile mice [131]. The ethanolic extract of the drugs may be thus useful for accelerating repair of damaged neurons Improves intelligence, power concentration, retention and memory. It exists an anabolic and adaptogenic effec

Hyperactivity- Impulsivity: The changes in hyperactivity-impulsivity criteria reached statistically highly significant Levels (p<0.0001***), also some relief was seen in symptoms of hyperactivity-impulsivity clinically. Previous studies on Mandukaparni are evident for its action on hyperactivity too, Alcoholic extract of the plant shows tranquilizing, sedative and anti anxiety effects in experimental animals. (Ramaswamy et al. 1970, Diwan et al.1991)[132,133].

Group B- Jatamansi churna- Inattention : Though Clinically relief was found in criteria of inattention statistically results were significant (p<0.0233*) , previous studies not support this results as they explain jatamansi also has action in inattention component.

N. jatamansi ethanolic extract significantly improved learning and memory in young mice and also reversed the amnesia induced by diazepam

Hyperactivity- Impulsivity: The results in criteria for hyperactivity were highly significant (p<0.0001***) in Mandukaparni group and significant (p<0.0150*) in Jatamansi group clinically as well as statistically. As active component Jatamansone already proved having action on hyperactivity- impulsivity and aggressiveness, study supports "Preliminary clinical studies with jatamansone reported reduced incidence of aggressiveness, restlessness, stubbornness and insomnia. In a study conducted on hyperkinetic children, jatamasnone,

D-amphetamine and chlorpromazine were compared for efficacy. Jatamasnone and amphetamine significantly improved behavior but amphetamine was better in reducing aggressiveness and restlessness.Comparison of effect intervention i.e. between before treatment and after treatment total Percentile scores (overall therapy) By comparison of effect intervention i.e. between before treatment

and after treatment total Percentile scores (overall therapy) jatamnsi shown nosignificant result with P Value (0.1150).

CONCLUSION

The classical concepts of Manas are essential for understanding psychopathology of diseases that affect it and also for their management. The nearest correlation of the Manas can be done with the cerebral cortex of brain which forms one of its functional units. The disease is heterogeneous in nature and no one single cause can be identified as causing the disease. The core symptom of ADHD i.e. inattention, hyperactivity and impulsivity render a child compromised on emotional and intellectual fronts. The disease ADHD though not mentioned in our classics can be understood by applying the basic principles of Ayurveda. Various regimes mentioned in the classical texts to be followed before conception, during antenatal period and after child birth can be effectively used to prevent the ADHD. The concept of Sadavritta Palan and Feingold diet both are effective in the treatment of ADHD.The drug Mandukaparni and Jatamansi churna was thus selected for the present study following the concepts of Medhya rasayana in management of psychiatric disorders. Mandukaparni churna provided highly significant results in improving the inattention which indicates the capacity of the drug in improving attention and concentration. No adverse effects of the drug therapy were observed during the study. Non pharmacological therapy of Sadhavrith palan and Feingold diet chart ensure a better quality of life in the patients of ADHD.

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