



Study of Medhya Effect Of Brahmi (*Bacopa Monneri* Linn.) In Oppositional Defiant Disorder

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Abstract:

Number of medicinal plants is being used for the treatment of various Psychiatric & Psychosomatic disorders. In current era, percentage of behavioral disorders are alarmingly increasing. Oppositional Defiant Disorder is one of the behavioral disorders of children, which hampers scholastic performance of the child. According to the epidemiological survey, the prevalence of Oppositional Defiant Disorder is 6% in America. It is more common among children from lower socio economic status (SES) families. If we consider the therapeutic measures for this, modern psychology relies upon behavioral therapy & educational intervention. The medication therapy is yet to be established with concrete base. Considering above, Rasayana dravyas becomes more important as far as medical interventions for this problem is concerned.

Brahmi (*Bacopa monnieri* Linn.) is the Medhya Rasayana Drugs stated by Bhavaprakash Nihantu which is widely used in various diseases related to Manas eg. Unmada, Apasmara etc. In the context of Ayurveda as far as Oppositional Defiant Disorder is concerned, Manas, Vayu (Prana & Udana) & Sadhak pitta are most important factors. Hence in Oppositional Defiant Disorder a Rasayana which normalizes the functions of above doshas & Mana is required. Brahmi pacifies the aggravated doshas especially Vata & Pitta, so Brahmi is selected for the present study.

A prospective randomized controlled clinical trial was conducted on 40 patients of Oppositional Defiant Disorder of school age group of 9-11 years. The subjects fulfilling the criteria of selection were enrolled into the study after obtaining ICF. The criteria of assessment were Reduction in the gradation of defiant behavior as per CRF, Reduction in the score of Junior Eyesnck Personality Questionnaire, Effect on Mental Functions etc.

Keywords: Brahmi, oppositional deficient disorder, Medhya karma.

Introduction:

All children are oppositional from time to time, particularly when tired, hungry, stressed or upset. They may argue, talk back, disobey & defy parents, teachers & other adults. But when this behavior occur more frequently in the child than in other children of the same age & developmental level then it is termed as Oppositional defiant disorder¹. The disorder is more common in among children from lower socio-economic status (SES) families. Its etiology is believed to be multi-factorial. Genetic & environmental factors probably combine in the expression of the disorder. Child's inherent temperament, Family's response to the child's style, a biochemical or neurological factor, Family instability, Poor quality child care & lack of supervision. Risk factors are a parent with a mood or substance abuse disorder, Being abused or neglected, Harsh or inconsistent discipline, Lack of supervision, Poor relationship with one or both parents, Family instability, Expose to violence etc. Symptoms are Frequent temper tantrums, Excessive arguing with adults,

Active defiance & refusal to comply with adult requests & rules, Deliberate attempts to annoy or upset people, Blaming others for his or her mistakes or misbehavior, Often being touchy or easily annoyed by others, Frequent anger & resentment, Aggressiveness toward peers. Management of ODD can be done as Parent training programme to help manage the child's behavior, Individual psychotherapy to develop more effective anger management, Family psychotherapy to improve communication, Cognitive-behavioral therapy to assist problem solving & decrease negativity, Social skills training to increase flexibility & improve frustration tolerance with peers².

While considering the textual review, it is found that there is no direct reference of Oppositional defiant disorders. The management of Oppositional defiant disorder incorporates various aspects including cause elimination, shamana and sodhana treatment and remediation. Along with that use of Medhya rasaayana is vital. So Brahmi being Medhya Property³ is chosen as current study.

AIM:

To study Medhya effect of Brahmi (*Bacopa monnieri* Linn.) in Oppositional defiant disorder

OBJECTIVES:

To study Medhya effect of Brahmi.

To study Medhya Effect of Brahmi with special reference to Oppositional defiant disorder of school going children.

To observe the adverse effect of Brahmi (*Bacopa monnieri*) if any

MATERIALS & METHODS:

Type of study: A prospective, pilot, randomized, single blind controlled clinical trial

No. of Patients: 40 diagnosed patients of Oppositional defiant disorder in male and female patients of 3rd to 6th Std. (i.e. age group 9 to 11 years)

Drug: Brahmi Vati

Dose & time of drug administration: -

Dose:-1 gm / day in two divided doses.

Time of drug administration was

a) Rasayana kala i.e. morning

b)Nisha kala i.e. at night

Duration of Drug administration: -3 months.

Route of administration of Drug: orally

Follow up: every 15 days

Ethical Clearance:

Permission from the Institutional Ethics Committee (IEC) was obtained prior to initiation of the project.

No objection certificate to conduct the clinical trial was obtained from the head of the Primary and Secondary school.

Likewise written proxy consent from the parents of the children was taken.

Only those students who willingly participated and submitted informed consent forms (ICF) were enrolled in the project.

Drug Review:

Dose of Brahmi 1 gm /day in 2 divided doses was fixed. But considering the age group of the subjects, it is hard to take medicine in powder form because:

It is difficult to swallow the powder than tablet.

There is possibility of individual variation in the dose of powder. Hence, to avoid subjective variation in doses, tablets of Brahmi powder were prepared.

Tablet is more stable as a compact dosage form and is suitable for all ranges of doses. They are easy to handle, transport and storage.

Method of Preparation of Tablet:

For the present study, Brahmi tablets are prepared by Wet granulation method. Brahmi powder (100 meshes) along with additives sugar powder were mixed homogenously and granulation fluid i.e. small quantity of water was added with constant mixing, sufficient to convert into dough mass and passed through granulation, so as to get homogenous granules. Then these granules were dried at 40-60 ° C temperature in dryers. Then this mixture was added to feeder of tablet machine & compressed into tablet form. Each tablet of 250 mg contains: 235 mg Brahmi powder & 15 mg sugar powder.

Tablet Standardization:

1. Organoleptic Tests:

Color-Dark greenish

Odor – Non- specific

Taste- Bitter

2. Physical Standards:

Diameter-8.10 mm Weight Difference-0.01 mg Disintegration time - 15min. Hardness- 5.8 kg / sq. cm
Friability - < 1%

Wet of the tablet: 250 mg, Contents- Drug 235 mg & Sugar 15 mg

Selection and Withdrawal of Patients:

Baseline screening of the Subjects: -

A criterion for the baseline screening was feedback given by class teachers & parents through a specially prepared questionnaire.

A. Eligibility Criteria:-Students were included into the study if they meet all inclusion criteria and exhibited none of the exclusion criteria mentioned below.

B. Inclusion Criteria:-

School children of age group of 8-11 years.

Physically healthy children.

Children of confirmed diagnosis of Oppositional defiant disorder as per DSM IV⁴ criteria & JEPQ test⁵ were included in the trial.

A parent or legal guardian willing to give proxy consent to participate in the trial.

C. Exclusion Criteria: -

Children of age group below 8 years & above 11 years

Mentally healthy subjects

Mental Retardation

Subjects who have used any other investigational drug 1 month prior the start of clinical study

Withdrawal Criteria: -

Patient who wished to discontinue the treatment during trial period.

Patients who loose follow up for three consecutive visits.

Patients with serious adverse reactions.

Note: The withdrawal patients were replaced by having fulfilling criteria of Inclusion and followed up thereafter.

Grouping: -

Gr Group A - Study Group- *Bacopa monnieri* Linn.

Group B - Placebo Group- Starch powder

Assessment of Efficacy: -

To assess the efficacy of Brahmi in Oppositional defiant disorder of school children a standardized psychometric test known as junior eyesneck personality questionnaire (JEPQ) was selected.

Table No. 1 Monitoring & follow-ups: -

| | | | | | | | |
|--|---|----|----|----|----|----|----|
| | 0 | 15 | 30 | 45 | 60 | 75 | 90 |
|--|---|----|----|----|----|----|----|

| | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|
| Assessment criteria | | | | | | | |
| Physical | √ | × | × | × | × | × | √ |
| Mental | √ | √ | √ | √ | √ | √ | √ |
| JEPQ test | √ | × | × | × | × | × | √ |

Clinical examination was conducted every fortnight.

Specific criteria of assessment i.e. Junior eyesneck personality questionnaire (JEPQ) was applied on day 0 & last date of clinical study.

Primary End Point

Reduction in Junior eyesneck personality questionnaire (JEPQ) score

Improvement in behavioral profile & emotional stability as shown in progress report.

Secondary End Point-

Improvement in general physical & mental health.

Overall improvement in performance score.

Observations:

This clinical trial was conducted on 40 patients of Oppositional Deficient Disorder. Observations noted are:

1. Majority of patients are from age group of 11 years 70%, followed by 9 years 17.5%, and patients of 10 years were lowest i.e. 12.5%
2. Males 70% are more affected than females 30%. The ratio is 2.3:1
3. Highest no. of subjects are from low socio-economic group 77.5% followed by middle 22.5%
4. Maximum no. of subjects belongs to Vata-Pitta 57.5% and Kapha-Pitta 37.5 % Sharira Prakruti while only 5% subjects belong to Vata-Kapha Prakruti.
5. Samhana Shows 72.5% subjects have madhyam samhanana while 20 % subjects have avar samhanana and 7.5 % subjects have pravara samhanana.
6. The maximum percentage of subjects is of Mansa sarata 37.5% followed by Asthi sarata 25%, Rakta sarata 17.5 and Meda sarata 12.5%, Rasa sarata 7.5%

Functions of Mana:-

Tables No. 2 showing the comparative Improvement in Function of Mana in Groups A and B

| Group-A | Pravar | | | | Medhyam | | | | Avar | | | |
|----------|--------|----|----|----|---------|----|----|----|------|----|----|----|
| | BT | | AT | | BT | | AT | | BT | | AT | |
| | No | % | No | % | No | % | No | % | No | % | No | % |
| Chintya | 6 | 30 | 6 | 30 | 5 | 25 | 9 | 45 | 9 | 45 | 5 | 25 |
| Vicharya | 7 | 35 | 8 | 40 | 8 | 40 | 8 | 28 | 5 | 25 | 4 | 20 |
| Uhya | 3 | 15 | 3 | 15 | 5 | 25 | 5 | 25 | 12 | 60 | 12 | 60 |
| Dheya | 5 | 25 | 6 | 36 | 8 | 40 | 9 | 45 | 7 | 35 | 5 | 25 |
| Sankalpa | 3 | 15 | 3 | 15 | 5 | 25 | 6 | 30 | 12 | 60 | 11 | 55 |

Table No3

| Group-B | Pravar | | | | Medhyam | | | | Avar | | | |
|----------|--------|----|----|----|---------|----|----|----|------|----|----|----|
| | BT | | AT | | BT | | AT | | BT | | AT | |
| | No | % | No | % | No | % | No | % | No | % | No | % |
| Chintya | 5 | 25 | 5 | 25 | 3 | 15 | 4 | 20 | 12 | 60 | 11 | 55 |
| Vichārya | 8 | 40 | 9 | 45 | 3 | 15 | 3 | 15 | 9 | 45 | 8 | 40 |
| Uhya | 6 | 30 | 6 | 30 | 5 | 25 | 5 | 25 | 9 | 45 | 9 | 45 |
| Dheya | 4 | 20 | 4 | 20 | 6 | 30 | 6 | 30 | 10 | 50 | 10 | 50 |
| Sankalpa | 2 | 10 | 2 | 10 | 7 | 35 | 8 | 40 | 11 | 55 | 11 | 55 |

Results

Stastical Analysis of JEPQ Observation:

The data was analysed to know the statistical significance in study & placebo group. Student's 't' test for at 0.001 significant Level paired data was applied to compare the pre & post scores of both the groups

Table No.4 Showing Effect of Brahmi by Paired t Test in Study Group & Placebo Group:

| Groups | Observations | d.f. | S.E. | t- Value | Significance |
|---------------|--------------|------|-------------|----------|--------------|
| Study group | 90 days | 38 | ±0.6699368 | 7.985828 | <0.001 |
| Placebo group | | | +_0.9025546 | 1.495759 | >0.10 |

The above table shows that

In Study group calculated 't' value is greater than table 't' (P) value at 38 d.f. at 0.001 significant level. (P=<0.001). Hence the results of drug are statistically very significant.

In placebo (Group B) 't' Value is statistically not significant.

Table No. 5 Showing effect of the Study Drug in comparison with Placebo by Un-paired t test-

| No | Observation | d.f. | Standard error | T value | significance |
|----|-------------|------|----------------|----------|--------------|
| 1 | 90 days | 38 | +_0.722386 | 5.675636 | p<0.001 |

The above table shows calculated 't' value is greater than table 't' (P) value at 0.001 significant level. (P=<0.001). Hence the results of drug i.e. Brahmi (Bacopa monnieri Linn.) on Junior eyesnck personality questionnaire score are statistically very significant as compared to placebo.

Discussion

Bacopa monnieri Linn is widely accepted as Brahmi. Review of classical texts reveals that Brahmi is one of the best Medhya Rasayana Drug. The nootropic effect of Brahmi was vastly elaborated by the other scholars⁶, but the specific medhya effect of Brahmi on Oppositional defiant disorder is yet to be screened.

Probable mode Of Action of Brhami:

Nagarjuna in Rasavaisheshika sutra has clearly mentioned that Medhya drugs act mainly by prabhava. Medhya drugs exert their Medhya effect at different levels such as rasa, Agni, srotasa etc.

At the level of rasa they act by improving the nutrition of the functions of Medha,

At the level of agni, these drugs act by simulating and improving the functions of sadhakagni,

At the level of srotas these drugs improve the circulation of ahārarasa by opening and clearing the srotasa and these ultimately improve the functions of medha.

Action on Dosha-Dhatu-Mala⁷:

Dosha-Decreases Vata due to Madhura Vipaka, Pitta due to Tikta Rasa & Madhur vipaka & Kapha due to Madhur Rasa, Sheeta

Dhātu- Increases Majja due to Madhur Vipaka.

Mala- Purishahara, Sara Tikta rasa is acclaimed as Medhya. It is best amapachaka & removes obstruction. The drugs of madhur rasa increase the kapha in general and tarpaka and avalambaka kapha in particular, which nourish the dhi, dhrti, smrti and medha. Drugs of sheeta virya have soothing effect. Drugs of madhura vipaka nourish the dhi, dhrti, smrti and medha. Katu and amla vipaki drugs show medhya effect however; they also perform these functions by stimulating agni and purifying srotasa.

The intelligence & all conscious manifestations are attributed to the Satva-guna. Hence the akashiya, tejasa and apya drugs having the Satva guna predominance are mainly responsible for the promotion and nourishment of medhā. Pārthiva drugs may also be helpful in the nourishment of the medha. So Brahmi is having Tikt, Kashya, Madhur Rasa, and Madhur Vipaka & Sheet Virya it helps in improving Satva Guna of Mana^{8, 9}. Brahmi also having Laghu & Sar Guna^{10,11} are having a Satva guna dominance of varying degree. Even though Medhya drugs act by their prabhava, their mode of action can be interpreted as The drugs of laghu, usna, tiksna and sara guna increases the pitta in general and stimulate sadhakagni which in turn generates medha^{12,13}.

Conclusion

The rational clinical use of any drug signifies its action in a specific condition i.e. it affects on Mental Functions. In present study the specific test for Oppositional defiant disorder i.e. Junior Eyesnck personality questionnaire (JEPQ) Test revealed that Brahmi is highly effective in reducing the JEPQ score (P<0.001). At the same time the effect of placebo drug on JEPQ score is statistically insignificant (P>0.01). Considering the improvements in various functions of Mana, it is found that functions of Mana are improved substantially in trial drug group subjects. The objects of Mana especially Cintya (thinking), vicharya (analyzing) are improved. The results obtained from JEPQ Test, and functional evaluation of various functions of Mana suggests that Brahmi can be used effectively in the management of Oppositional defiant disorder.

It is hoped that this study will be useful to provide the positive direction to the parents, teachers & adolescents suffering from Oppositional defiant disorder & may come out with effective management of Oppositional defiant disorder.

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