

EFFECT OF MAMSYADI KWATHA ON ANXIETY LEVELS: AN EXPERIMENTAL STUDYShreevathsa¹, Rao Ravi S^{2*}, Krishnamurthy M S³, Shenoy Ravishankar⁴, Udupa Raghavendra⁵¹Asst Prof, Dept of Ayurveda Siddhanta, Govt. Ayu. Med. College, Mysore, Karnataka, India²Asso. Professor, P G Dept of Dravyaguna, Alva's Ayurveda Medical College, Moodbidri, Karnataka, India³Asso Professor and Head, PG Dept of Bhaishajya kalpana, Alva's Ayurveda Medical College, Moodbidri, India⁴Professor, Parassinakadavu college of Ayurveda, Parassinakadavu, Kerala, India⁵Asst Prof, Dept of Ayurveda Siddhanta, Alva's Ayurveda Medical College, Moodbidri, Karnataka, India

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ABSTRACT
Mamsyadi Kwatha an Ayurvedic formulation cited in Siddha Yoga Sangraha of Yadavji Trikrumji Acharya is said to be highly effective in various psychiatric conditions. This wellknown formulation contains the ingredients- Jatamamsi (*Nardostachys jatamansi* DC), Ashwagandha (*Withania somnifera*) and Parasika Yavani (*Hyocymus niger* Linn) in 8:4:1 ratio respectively. The test formulation was subjected to assess its effect on Anxiety status. The model selected for this study were Open field behavior test and Elevated Plus Maze Performance Test, in albino mice. The test formulation showed interesting results in anti anxiety property and pro-anxiety property at different phases of study.

Keywords- Mamsyadi Kwatha, Jatamamsi, Ashwagandha, Parasika Yavani. Open Field Behaviour test, Elevated plus Maze Performance Test.

INTRODUCTION

Kala is the supreme spirit /self manifested component which is beyond the initial point and end point¹. The Kala that we observe in nature has no separate existence and is only a mode of being of concrete objects. The concept of time is equivalent to the operation required to estimate duration in the objects of our universe. Inner time is the expression of changes of the body and its activities during the course of life. It is equivalent to the uninterrupted succession of structural, humoral, physiological and mental states which constitute our personality. Kala is the factor which decides drug action.

Effect of medicine always depends on its timely administration and proper duration². Depending on time factor drug acts differently. This is established in Charaka samhita Vimana sthana 1st chapter appropriately while narrating the effects of pippali. Pippali if used in proper dose for proper duration acts as Shubhakara. If pippali is used continuously it causes Tridosha kopa. 'Prayoga Sama Sadgunya' is must in medicine administration ie Oushadha administered in proper time for proper duration provides excellent effects. Here an effort has been made to assess the effect of duration of medicine administration.

Anxiety is defined as the state of apprehension, worry, uneasiness or dread especially of the future³. Everyone has been anxious at sometime. Anxiety is the normal reaction to that which is threatening to one's body, lifestyle, and values or loved ones. A certain amount of anxiety is normal and stimulates the individual to purposeful action. Excess anxiety interferes with efficient functioning of the individual. (Taber's encyclopedic medical dictionary Jaypee brothers)

Anxiety disorders, the most prevalent psychiatric illness in the general community are present in 15-20% of medical clinic patients. Anxiety, defined as a subjective sense of unease, dread or foreboding, can indicate a primary psychiatric condition or it can be a component of or reaction to, a primary medical disease.

Ayurveda gives answer for anxiety disorders. Various interventions of Ayurveda provide excellent effects in psychiatric conditions. Mamsyadi kwatha, an ayurvedic formulation narrated in Siddha Yoga Sangraha⁴ is said to be effective in psychiatric disorders. In the present study the formulation is subjected for experimentation with two dosing schedules i.e Acute and Chronic to assess its effects on anxiety level and also to assess its effect based on duration of administration.

Objectives

1. To assess the effect of Mamsyadi Kwatha on anxiety Status.
2. To assess the effect of the components of Mamsyadi Kwatha viz Jatamamsi, Ashwagandha and Parasika Yavani on anxiety level.
3. To assess the effect of duration of administration of test formulation on anxiety level.

MATERIALS AND METHODS**Animals**

Swiss albino mice of either sex weighing between 20g – 40g were randomly selected & maintained in the animal house attached to the pharmacology laboratory of I.P.G.A & R.A. They were maintained on "Amrut" brand mice pellets. Both food & tap water were given ad libitum. Animals were exposed to natural day & night cycle. 60-85% of humidity was maintained. The drugs under trial were administered orally with help of a specially prepared catheter.

Grouping

Albino mice were divided into 5 groups each containing 6 mice. Control group (cg):- Mice of this group were administered with 80ml/kg/day of distilled water each. Jatamamsi kwatha group (jkg)- Jatamamsi kwatha of 80ml/kg/day was administered to each mouse of this group. Ashwagandha group (ag)- Ashwagandha kwatha was administered in the dose of 80ml/kg/day for each mouse of this group. Parasika yavani group (pyg)- Each mouse of this group was administered with the decoction of Parasika Yavani in the same dose as stated as above.

Mamsyadi kwatha group (mkg)-80ml/kg/day of the mamsyadi kwatha was administered for each mouse.

Route of administration, duration & dose

Freshly prepared decoction of above mentioned drugs administered orally in a dose of 80 ml /kg/day, with the help of specially prepared catheter. The duration was 7 days for chronic study & one day for acute study.

Statistical analysis

Done by employing students't' test for paired & unpaired data & also by non parametric methods, A 'p' value of less than 0.05% was considered as statistically significant.

Experimental procedure

Experiments were carried with 2 dosing schedules.

- 1) Acute Study – Test drugs administered one hour prior to experimentation. On the same day experiments were conducted.

- 2) Chronic Study – Trial drugs were administered for 7 days, on 8th day morning experiments one hour after the administration of test drug.

Test formulation: Mamsyadi kwatha

Reference : Siddha Yoga sangraha

Ingredients:

- 1) Jatamamsi – 1 part
- 2) Ashwagandha – ¼ part
- 3) Parasika yavani – 1/8 part

Preparation of medicine

- 1) Jatamamsi Kwatha: decoction prepared by boiling 1 part of coarse powder of jatamamsi in 16 parts of water & reducing into 1/4th part
- 2) Ashwagandha Kwatha – Prepared as mentioned above
- 3) Parasika Yavani kwatha – Prepared as mentioned above
- 4) Mamsyaadi kwatha – Prepared as mentioned above

For each experimentation fresh decoction was prepared. Here 1ml of decoction consists of the water extractable material of 500 mg of the drug.

The details of the ingredients is given in the table No 01

Experimental models

(A)Open Field Behaviour⁵

This test was carried out in mice of either sex using on open field apparatus as described by Bhattacharya and Co-workers (1993). The apparatus is an open square box of 96 cm x 96 cm dimension, the side wall were high. The floor is divided into 16 equal squares. The apparatus was placed in dim light area and absolute silence was maintained during experimentation. Each mouse placed at one corner of the apparatus, one hour after the administration of test drug, and allowed to explore the arena for three minutes. Number of rearing, number of faecal pellets expelled, number of squares crossed and immobility period were noted during 3 minutes observation period. The control group was administered with an equal volume of plain water.

The experiment is conducted seven days after administration of test drugs i.e. on eighth day and also it is conducted after administration of single dose

(B)Elevated plus maze test⁶

The apparatus consisted of two opposite open arms made of wood 25 cm x 25 cm crossed with two closed arms of the same dimension with walls of 36 cm high. The arms are connected to a central square of 7.5 cm x 7.5 cm dimension. This gave the apparatus the shape of plus sign. The entire apparatus was placed on a 25 cm high platform in a dimly lit room. Test drug administered to each mouse. After exactly one hour, each mouse was placed in the center square of the maze facing on enclosed arm. During next five minutes the number of entries, the mouse makes to both open and closed arms, time spent there and latency of entry into the arms were recorded.

This experiment was also conducted in two phases :

- (1)Test drugs administered for 7 days. On eight day morning, one hour after administration of test drugs experiments were conducted.

- (2)Experimentation done after administering the single dose.

Tap water administered mice served as control group.

OBSERVATIONS AND RESULTS

Effect of Test Drugs on Open Field Behaviour of Albino Mice

Table 02, Depicts data on the effect of test drugs on Open Field Behaviour in Mice

In Jatamamsi, Parasika Yavani and Mamsyadi Kvatha an increase in the number of squares crossed by the mice was observed. However it was not statistically significant. Whereas the increase in number of squares crossed by Asvagandha administered mice was highly significant (P<0.01).

Number of rearing increased in Jatamamsi and Parasika Yavani administered group and it is decreased in Asvagandha and Mamsyadi Kvatha administered group, however, the observed changes were not statistically significant.

The duration of immobility was highly significantly reduced in (P<0.01) Asvagandha. Parasika Yavani and Mamsyadi Kvatha administered group in comparison to control group. There was marginal reduction in duration of immobility in Jatamamsi administered group which is not statistically significant.

The number of pellets excreted was at significant level (P<0.05) in Jatamamsi, Asvagandha and Parasika Yavani administered group and at highly significant level in (P<0.01) Mamsyadi Kvatha administered group.

Table 03 shows the data related to effect of chronic administration of test drugs on "Open Field Behaviour" of Albino Mice. There was an apparent decrease in number of squares crossed in Jatamamsi group (57.28%), however it was not statistically significant. Decrease in number of squares crossed was also observed in Asvagandha. Parasika Yavani and Mamsyadi Kvatha administered group. However this decrease was not statistically significant.

Considerable reduction in number of rearing is observed in Jatamamsi (78.72%), Mamsyadi Kvatha (67.44%) and Asvagandha (65.11%) administered group and slight reduction was observed in Parasika Yavani administered group. None of these changes were statistically significant.

There was significant reduction (P<0.05) in duration of immobility in Jatamamsi administered group. But reduction in duration of immobility in Asvagandha administered group and increase in duration of immobility in Parasika Yavani group and Mamsyadi Kvatha group were not statistically significant.

Reduction in number of pellets observed in Asvagandha and Parasika Yavani administered group was not statistically significant.

The data on the effect of test drugs on different parameters employed to assess behaviour of mice in the elevated plus maze can be observed in Table 04 marginal increase in latency of first entry to open tunnel was observed in Jatamamsi and Mamsyadi Kvatha administered groups and mild decrease was observed in Parasika Yavani administered group which was not statistically significant. However the decrease in Latency of first entry to open tunnel observed in Asvagandha administered group was statistically significant (P<0.05).

The duration spent in open tunnel was reduced in Mamsyadi Kvatha (55.13%) and Asvagandha (42.30%) administered group which was statistically very significant (P<0.01), whereas it was reduced in Parasika Yavani group (34.94%) which was statistically significant (P<0.001) very highly.

Reduction observed in duration spent in open tunnel in Jatamamsi administered group was not statistically significant.

Marked reduction in number of entries to the open tunnel was observed in all the groups but it is statistically significant (P<0.05) in Jatamamsi and Mamsyadi Kvatha administered group.

The data enumerated in the above table(05) shows the effect of test drugs on various parameters employed to assess behaviour of mice in the Elevated plus maze test during chronic administration and marginal decrease in the Latency of first entry to open tunnel was observed in Jatamamsi administered group. A marginal increase in latency of first entry to the open tunnel was observed in Mamsyadi Kvatha (33.59%) and Asvagandha administered groups. More than 154% increase in latency of first entry to the open tunnel was observed in Parasika Yavani administered group. However the prolongation was found to be statistically non significant.

A marginal increase in duration spent in open tunnel observed in Jatamamsi Asvagandha, Parasika Yavani and Mamsyadi Kvatha administered group was found to be statistically non significant.

A marginal decrease in number of entries to the open tunnel was observed in Asvagandha (20%) administered group. A marginal increase in number of entries to the open Tunnel was observed in Jatamamsi and Mamsyadi Kwatha administered group. However the findings were found to be statistically non significant.

DISCUSSION

Mamsyadi kwatha an unique Ayurvedic formulation for various mental disorders is subjected for experimental study .Classical method of preparing the kwatha was followed in the present study as per the reference of Bheshaja Samhita and also based on clinical posology .To evaluate the effect of the test formulation and its components on anxiety levels, open field behaviour test and elevated plus maze performance test were incorporated in the present study. Tests were carried out with two dosing schedules viz Acute and Chronic study.

Open Field Behaviour- in Jatamamsi administered group there was only marginal increase in motor activity and number of rearings. No of faecal pellets decreased. Ashwagandha administered group showed significant increase in motor activity but decrease in umber of rearing, duration of immobility and no of faecal pellets. Almost similar was observed with Parasika Yavani and Mamsyadi Kwatha group. This clearly indicates that the test formulation produces complex CNS activity.

On Chronic administration none of the drugs could produce any of the activity observed as acute dosing. In Jatamamsi treated there was no decrease in motor activity, number of rearing and duration of immobility. Faecal pellet expulsion did not show any change. Other test drugs did not produce any significant effects.

The difference in activity profile in acute and chronic drug administration may be due to changes in CNS levels of neurotransmitters-especially Monoamines. On acute administration the test drugs may elevate the CNS levels of Mono amines and discrete levels. This effect may level off on chronic administration due to feed back mechanism governing the turnover of neuro transmitters. Hence on Acute administration pharmacological activity may be expressed and on chronic administration same may not be observed. It may not be same at all centers. There is likely to

be differences depending on the site of action, because same type of observation was not seen in all the experimental paradigms employed in the study.

Elevated plus Maze is extensively used to assess anxiolytic activity in test drugs. On acute observation pro-anxiety effect was observed with Ashwagandha. Parasika Yavani and Test formulation Mamsyadi Kwatha. There was decrease in both number of entries and duration spent in open tunnel. However this effect was absent when tested after chronic administration. The results clearly indicate absence of anti – anxiety effect in the test drugs. The pro-anxiety effect may be due to elevation of monoamines on acute administration. On chronic administration this effect may be modulated by the adjustment in mono amine turn over mechanism.

On short term drug administration (Acute study) the test formulation showed pro-anxiety effect. While during long term administration (Chronic study), the test formulation showed anxiolytic effect.

CONCLUSION

Mamsyadi Kwatha , an Ayurvedic formulation exhibited both pro-anxiety and anxiolytic effect during acute and chronic dosing schedules respectively. Pro-anxiety effect is represented by decrease in both number of entries and duration spent in open tunnel in Elevated plus maze test. The anxiolytic effect in chronic dosing schedule is represented by decrease in number of rearing, duration of immobility and number of faecal pellets in Open field behavior Test. Duration of drug administration thus one among the factors decides drug action.

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Table -01 Ingredients of Mamsyadi kashaya

Sl.No	Sanskrit name	Botanical name	Family	Guna	Part used
1	Jatamamsi	<i>Nardostachys jatamamsi</i> DC	Valeria naceae	Samjna Sthapana	Rhizome
2	Ashwagandha	<i>Withania somnifera</i> Linn	Solanaceae	Balya brumhana vishagna (Ca) Shothahara Ropana (Su)	Roots
3	Parasika Yavani	<i>Hyoscymus niger</i> Linn	Solanaceae	-	Dried leaves with flowering tops, seeds

Table 2 Acute Single Dose Study

Group	Dose ml/kg	No of squares crossed Mean± SEM	No of Rearing Mean ±SEM	Duration of Immobility (Sec) Mean± SEM	No of Pellets Mean± SEM
Control G	80	22.83 ±8.19	4.83 ±1.108	55.83± 9.346	7.5 ±1.94
Jatamamsi G	80	33.83 ±16.93	6.33 ±3.018	43.33 ±27.38	1.66 ±0.66*
Ashwagandha G	80	69.33 ±6.72	1.83 ±0.6	0.66 ±0.66**	1.83 ±0.6*
P .Y.G	80	45.8 ±16.53	6.5 ±1.72	2.66 ± 2.66**	1.66 ±0.918*
M.K.G	80	45.66 ±21.81	3.83 ±2.315	3.33 ±3.33**	0.666 ±0.49**

*P<0.05 **P<0.01

Table -03 Chronic Administration

Group	Dose ml/kg	No of squares crossed Mean± SEM	No of Rearing Mean ±SEM	Duration of Immobility (Sec) Mean± SEM	No of Pellets Mean± SEM
Control G	80	32 ±15.3	8.6 ±4.69	6.72 ±19.82	3.2 ±0.8
Jatamamsi G	80	13.67± 5.94	1.83 ±1.07	12.5 ±2.71*	3.5 ±0.92
Ashwagandha G	80	22.6±11.89	3 ±0.774	44.4±20.72	1.8 ±0.8
P .Y.G	80	26.83± 15.54	6.33± 1.94	83.33 ±25.77	1.33± 0.49
M.K.G	80	21.4 ±11.27	2.8 ±1.39	82 ±32.77	3± 0.83

* P<0.05

Table -04 Effect of test drugs on "elevated plus maze performance" of albino mice Acute single dose administration

Group	Dose ml/Kg	Latency of First Entry to the Open Tunnels Mean \pm SEM	Duration Spent (Sec.) Mean \pm SEM	Number of Entries to Open Tunnel(Sec.)Tunnel Mean \pm SEM
Control	80	19.83 \pm 2.286	52 \pm 3.17	8.5 \pm 1.17
Jatamamsi Group	80	25.66* \pm 6.878	40.33 \pm 4.477	5.16 \pm 0.307
Asvagandha Group	80	11.5 \pm 1.5*	30. \pm 4.78**	6.16 \pm 0.749
Parasika Yavani Group	80	15.66 \pm 1.763	33.83 \pm 2.44***	5.66 \pm 0.614
Mamsyadi Kvatha Group	80	20.66 \pm 4.58	23.33 \pm 2.4**	4.5 \pm 0.619 *

* P<0.05 **P<0.01 *** P<0.001

Table – 05 Chronic administration

Group	Dose ml/Kg	Latency of First Entry to the Open Tunnels Mean \pm SEM	Duration Spent (Sec.) Mean \pm SEM	Number of Entries to Open Tunnel(Sec.) Tunnel Mean \pm SEM
Control	80	20.66 \pm 8.52	32 \pm 9.08	6.5 \pm 1.11
Jatamamsi Group	80	16.66 \pm 2.29	40 \pm 4.946	6.66 \pm 0.988
Asvagandha Group	80	30 \pm 4.76	35.6 \pm 3.828	5.2 \pm 0.489
Parasika Yavani Group	80	52.5 \pm 16.7	40 \pm 8.004	6.5 \pm 1.056
Mamsyadi Kvatha Group	80	27.6 \pm 5.988	40.6 \pm 4.98	7 \pm 0.836

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