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Evaluation of the Antipsychotic Activity of Jatamansi Using Actophotometer.

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ABSTRACT: This research work was performed to evaluate the antipsychotic activity of jatamansi against dexamethasone induced psychosis in rats. Antipsychotic potentials of the jatamansi were compared with haloperidol. Dexamethasone induced severe behavioural changes in experimental animals. Behavioural abnormalities were studied in rats by using climbing behaviour apparatus and actophotometer. Rats of either sex were divided into 9 groups of 6 animals in each group. Group I- Distilled water (Vehicle), group II- Saline water, Group III- Dexamethasone (2 mg/kg), Group IV- Jatamansi (200 mg/kg), Group V- Haloperidol (1 mg/kg), Group VI- Dexamethasone + Haloperidol, Group VII- Jatamansi + Dexamethasone, Group VIII- Jatamansi + Haloperidol, Group IX- Jatamansi + Dexamethasone + Haloperidol. All test solutions were freshly prepared daily and administered to animals by intraperitoneal (i.p.) route. After giving dose, each animal was check to induced psychosis by using climbing behaviour apparatus and actophotometer. Our result showed that Dexamethasone exposure result increased climbing behavioural scores and also increased locomotor activity in rats. Jatamansi (200 mg/kg) and jatamansi (200 mg/kg) + Dexamethasone (2 mg/kg) showed significantly decreased climbing score to climbing behaviour apparatus and locomotor activity to actophotometer. These results support that Jatamansi (200 mg/kg) reduced psychotic behaviour and prevent psychosis induced by Dexamethasone. Jatamansi not equally potent to as Haloperidol (1 mg/kg).
KEYWORDS: Dexamethasone, Haloperidol

I. INTRODUCTION

In psychosis, there is abnormal condition of mind that involves loss of contact with reality, personality changes and thought disorder (Kelly and Evelyn, 2001). Psychosis causes the changes in person's feel, behave, think and unable to distinguish between reality and their imagination (NHS; Feidhmeannacht Na Seirbhise slainte; www.nhs.uk). There are many antipsychotic drugs used today but have serious adverse effect so that the demand of herbal drugs is increasing day-by-day. Nardostachys jatamansi have wide variety of pharmacological activities from its different parts. Ethanolic extract of Nardostachys jatamansi give the neuroleptic activity with different antipsychotic model (Jash et al., 2013).

Psychosis is a mental disorder has become highly prevalent due to lifestyle, urbanization and stressful environment. Psychosis is a one of the most severe, complex and costly illness. It alters a person's ability to think clearly, make good judgments, respond emotionally, communicate effectively, understand reality, and behave appropriately. It is characterized by three types of symptoms: positive symptoms, negative symptoms and cognitive symptoms. Positive symptoms are those in which there is loss of contact with reality and comprise of hallucinations, delusions, bizarre behaviour and positive formal thought disorder. Negative symptoms are those in which there is absence of normal behaviour and includes flat effect, alogia, avolition and anhedonia. Cognitive symptoms includes deficit in memory, learning, concentration and executive function (abstract thinking, problem resolving). About 1% of the population suffers from the illness across worldwide (Yadav et al., 2015).

There are several antipsychotic drugs which are in use today but the safety profile is not considered because there are serious adverse effects of these drugs such as tardive dyskinesia, muscle dystonia etc. These antipsychotics may act on dopaminergic pathways in the brain permanently dysfunction.

Demand of herbal drugs is increasing and herbal drugs have minimal adverse effects (Jash et al., 2013). Jatamansi has been widely used for medical and in perfumery for century in India. Jatamansi was discovered in 1790s, Sir William Jones, a famous orientalist, that 'Nardus' of Greeks, 'spikenard' of holy bible, 'sumbul-e-Hind' of Arabians, and 'balchir' of India are jatamansi of Sanskrit (Leaman, 2007). In 1821, De Candolle described it as Valeriana Jatamansi and finally in 1830 as Nardostachys jatamansi. It is generally found in alpine area of India (Jammu & Kashmir, Himanchal Pradesh, Uttarakhand, Sikkim), Pakistan, Nepal, Tibet, China and

Yunan (Kokate et al., 1994). Nardostachys jatamansi shows wide spectrum of pharmacological activity such as antioxidant, cardiotonic, hair growth, antihyperglycemic effect, antiparkinson (Ahmed et al., 2013), anticonvulsant, hepatoprotective, antidepressant (Monga and Kumar, 2013), antiulcer activity (Syed et al., 2016), antifungal and antibacterial, anticancer, radioprotective (Sahu et al., 2016), hypolipidemic, neuroprotective (Singh et al., 2009). As a flavouring agent, jatamansi oil is used in the preparation of medicinal oil and it also contains antiarrhythmic activity (Kokate et al., 2010).

II. MATERIAL AND METHOD

Preparation of Jatamansi extract:

The plant material (dried rhizome) was procured from local market of Bareilly, Uttar Pradesh, India in December 2017. The plant material was identified and the voucher specimen was deposited in the institutional herbarium. The dried root of Nardostachys jatamansi was grounded to small pieces and further dried under shade for 24 hours. Then it was converted into coarse powder. To get uniform particle size, powder had passed through 40 mesh sieve (Ahemad et al., 2009). Jatamansi root extract would be prepared by 100 grams of jatamansi root powder in 90% ethanol at 50^{O}C to 60^{O}C by using soxhlet extractor for 72 hrs. Then it would be concentrate. The extract was suspended in distilled water and administered orally (Damodara et al., 2013).

Authentication:

The collected rhizomes of *Nardostachys jatamansi* was authenticate by Department of Plant Science, M.J.P. Rohilkhand University, Bareilly.

Animals:

Albino rats (150-250gm) were selected from the animal house of our Department of Pharmacy, M.J.P. Rohilkhand University, Bareilly. The animal should be housed in 9 groups in two apparatus and were feed on standard pallet diet and water ad libitum and kept in the evvironment controlled 22±2^{O}C on a 12 hrs light/dark cycle and 50+5% humidity.

Drugs and Chemicals:

All drug solution was freshly prepared daily before use. Haloperidol (RPG Life Science Limited, Gujarat, U.P.) was diluted in normal saline solution. Jatamansi extract was dissolved in distilled water. Dexamethasone (Candila Pharmaceutical, Gujarat, U.P.) was dissolved and diluted in normal saline solution.

Actophotometer apparatus:

The spontaneous activity is assessed with the help of actophotometer. Each animal has been observed for a period of time in a square closed arena (36cm×36cm×14cm) equipped with six photocells in the outer wall and wire mesh bottom, in which the animal moves. The arrangement of six lights and photocells in such a way that single animal can block only one beam. When the animal moves, they interrupt a beam of light that is falling on a photocell, at which a count is recorded and displayed digitally (Habibur et al., 2010; Tirumalasetti et al., 2015).

Fig. Actophotometer apparatus

Experimental protocol for Actophotometer apparatus:

Treatment:

Rats of either sex were divided into 9 groups of 6 animals in each group which are mentioned below. All test solution were freshly prepared daily and administered for one day except haloperidol. Haloperidol administered for 5 days and administered by i.p. route in animals.

Normal Saline Group (Group I, n=6)

Rats were administered normal saline (30 ml/kg, p.o.) 30 minutes before to test the locomotor activity.

Distilled Water Group (Group II, n=6)

Rats were administered normal saline (30 ml/kg, p.o.) 30 minutes before to test the locomotor activity.

Dexamethasone Treated Group (Group III, n=6)

Rats were administered dexamethasone (2 mg/kg, i.p.) 10 minutes before to test the locomotor activity.

Haloperidol Treated Group (Group IV, n=6)

Rats were administered haloperidol (1 mg/kg, i.p.) continue for 5 days and 6^{th} day test the locomotor activity.

Jatamansi Treated Group (Group V, n=6)

Rats were administered jatamansi (200 mg/kg, p.o.) 1 hour before to test the locomotor activity.

Dexamethasone + Haloperidol Treated Group (Group VI, n=6)

Haloperidol (1 mg/kg, i.p.) administered for 5 days and on 6^{th} day, administered Dexamethasone (2 mg/kg, i.p.) 10 minutes before to test the locomotor activity.

Dexamethasone + Jatamansi Treated Group (Group VII, n=6)

Rats were administered jatamansi (200 mg/kg, p.o.) 1 hour before to test the locomotor activity and dexamethasone (2 mg/kg, i.p.) 10 minutes before to test the locomotor activity.

Haloperidol + Jatamansi Treated Group (Group VIII, n=6)

Haloperidol (1 mg/kg, i.p.) administered for 5 days and on 6^{th} day, administered Jatamansi (200 mg/kg, p.o.) 1 hour before to test the locomotor activity.

Dexamethasone + Haloperidol + Jatamansi Treated Group (Group IX, n=6)

Haloperidol (1 mg/kg, i.p.) administered for 5 days and on 6^{th} day, administered Jatamansi (200 mg/kg, p.o.) 1 hour before and Dexamethasone (2 mg/kg, i.p.) 10 minutes before to test the locomotor activity.

GROUPS	TREATMENT
Group I	Distilled water (vehicle, p.o.)
Group II	Normal saline (0.9%, p.o.)
Group III	Dexamethasone (2 mg/kg, i.p.)
Group IV	Haloperidol (1 mg/kg, i.p.)
Group V	Jatamansi (200 mg/kg, i.p.)
Group VI	Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.)
Group VII	Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.)
Group VIII	Jatamansi (200 mg/kg, p.o.) + Haloperidol (1 mg/kg, i.p.)
Group IX	Jatamansi (200 mg/kg, p.o.) + Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.)

Table. Animal group treatments

Actophotometer test:

Each and every treated animal was placed individually in cages. Interruption the photocells beam is recorded by mean of electronic counting device. Note the basal activity score for each animal. Calculate the percentage decrease in motor activity (Tirumalasetti et al., 2015; Bogicevic, 2015).

Statistical Analysis:

All results were expressed as mean ± SEM. Data was analyzed using one way ANOVA followed by Dennett's test and standard t-test using graph pad prism. $P < 0.05$ was considered to be statistically significant.

III. RESULT

Following groups were evaluated by using **Actophotometer Apparatus**. Locomotor activity was noted down, during the time session of 10 minutes. According to this procedure, graphs were plotted and the psychotic activities in animals were evaluated.

1. EFFECT OF DISTILLED WATER AND NORMAL SALINE USING ACTOPHOTOMETER APPARATUS TEST:

Distilled water and Normal saline administered rat groups was found out that there was no significant difference between Distilled water and Normal saline on locomotor activity of animals in actophotometer apparatus, during trial conducted on only one day (Table. 1 & Fig. 1).

2. EFFECT OF DEXAMETHASONE AND HALOPERIDOL USING ACTOPHOTOMETER APPARATUS TEST:

Dexamethasone (2 mg/kg, i.p.) administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus as compared to Normal saline administered rat groups. Haloperidol (1 mg/kg, i.p.) administered rat groups was found decreasing locomotor activity in actophotometer apparatus as compared to Normal saline treated rat group, during trial conducted on only one day (Table. 2 & Fig. 2).

3. EFFECT OF JATAMANSI USING CLIMBING ACTOPHOTOMETER APPARATUS TEST:

Jatamansi (200 mg/kg, p.o.) administered rat group was found out that there was decreasing locomotor activity in actophotometer apparatus as compared to Distilled water treated rat groups, during trial conducted on only one day (Table. 3 & Fig. 3).

4. EFFECT OF DEXAMETHASONE, HALOPERIDOL AND JATAMANSI USING ACTOPHOTOMETER APPARATUS TEST:

Dexamethasone (2 mg/kg, i.p.) administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus as compared to Haloperidol (1 mg/kg, i.p.) administered rat group and when Dexamethasone (2 mg/kg, i.p.) administered rat groups was compared with Haloperidol (1 mg/kg, i.p.)

administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus, during trail conducted on one day (Table. 4 & Fig. 4).

5. EFFECT OF DEXAMETHASONE AND DEXAMETHASONE + JATAMANSI + HALOPERIDOL USING ACTOPHOTOMETER APPARATUS TEST:

Dexamethasone (2 mg/kg, i.p.) administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) + Haloperidol (1 mg/kg, i.p.) administered rat groups, during trail conducted on one day (Table. 5 & Fig. 5).

6. EFFECT OF HALOPERIDOL + JATAMANSI AND DEXAMETHASONE + HALOPERIDOL + JATAMANSI USING ACTOPHOTOMETER APPARATUS TEST:

Haloperidol (1 mg/kg) + Jatamansi (200 mg/kg, p.o.) administered rat groups was found significantly decreasing locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg) + Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg) administered rat groups, during trail conducted on one day (Table. 6 & Fig. 6).

7. EFFECT OF JATAMANSI, HALOPERIDOL AND HALOPERIDOL + JATAMANSI USING ACTOPHOTOMETER APPARATUS TEST:

Jatamansi (200 mg/kg, p.o.) administered rat groups was found slight increasing locomotor activity in actophotometer apparatus as compared to Haloperidol (1 mg/kg, i.p.) administered rat groups. Jatamansi (200 mg/kg, p.o) administered rat groups was found slight decreasing locomotor activity in actophotometer apparatus as compared to Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) administered rat groups, during trial conducted on one day (Table. 7 & Fig. 7).

8. EFFECT OF DEXAMETHASONE + JATAMANSI, DEXAMETHASONE + HALOPERIDOL AND DEXAMETHASONE + HALOPERIDOL + JATAMANSI USING ACTOPHOTOMETER APPARATUS TEST:

Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) administered rat groups. Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) administered rat groups was found significantly increasing locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) administered rat groups, during trial conducted on one day (Table. 8 & Fig. 8).

Treatment	**Distilled water**	**Normal saline**
Value	249.17±13.76	250±12.87

Table. 1 Effect of Distilled water and Normal saline on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity which was obtained from actophotometer apparatus which is conducted for psychosis test.

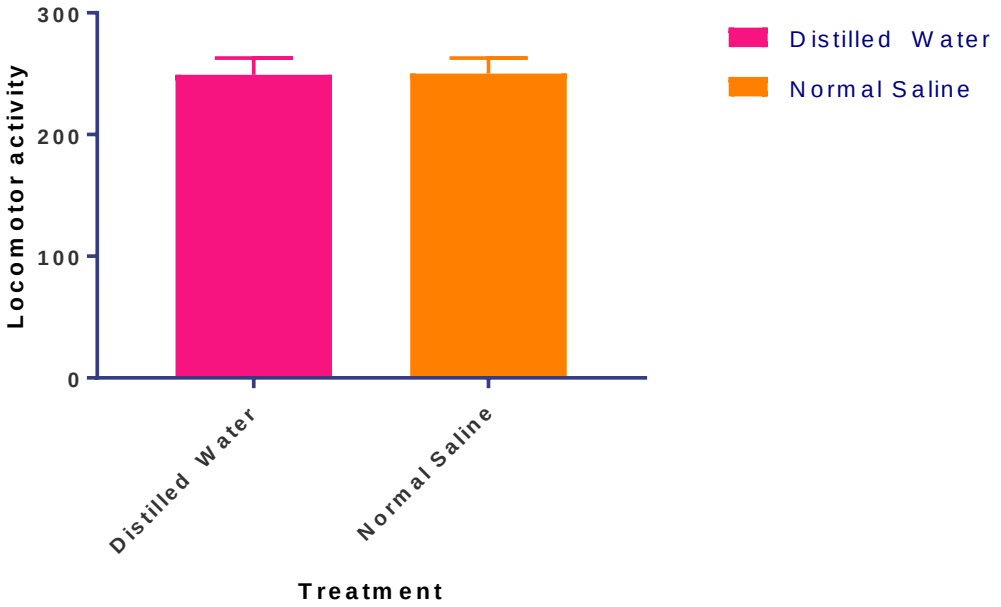

Fig. 1 Effect of Distilled water and Normal saline on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. There is no significant difference between Distilled water and Normal saline, obtained p value is 0.9657.

Treatments	**Normal saline**	**Dexamethasone**	**Haloperidol**
Value	250±12.87	380.83±45.31	204.17±7.83

Table. 2 Effect of Normal saline, Dexamethasone and Haloperidol on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

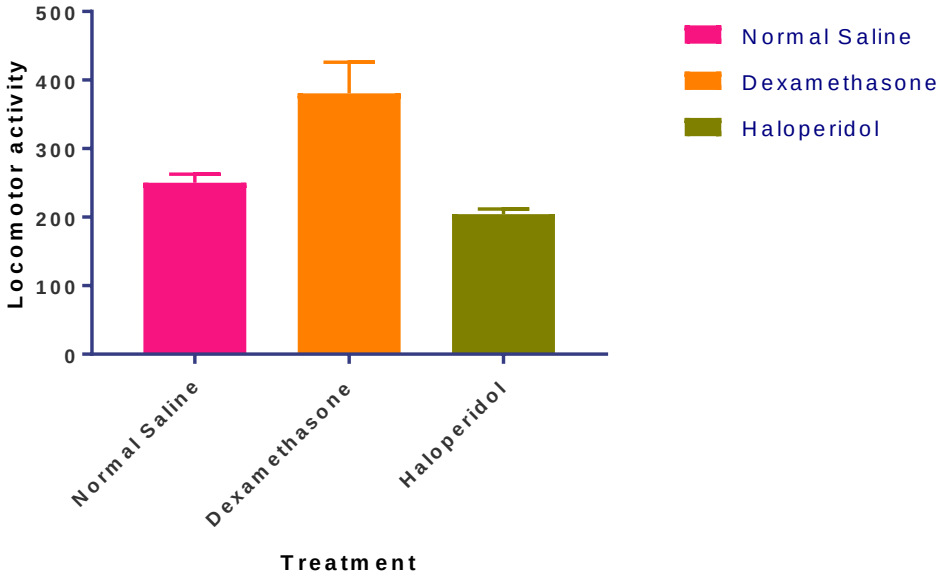

Fig. 2 Effect of Normal saline, Dexamethasone and Haloperidol on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day and was found significant difference between normal saline and Dexamethasone (2 mg/kg, i.p.) treated rat groups, (p value 0.0081). Normal saline treated rat groups showed no significant difference in locomotor activity as compared to Haloperidol (1 mg/kg, i.p.) treated rat groups, (p value 0.4142).

Treatments	**Distilled water**	**Jatamansi**
value	249.17±13.76	237.67±21.93

Table. 3 Effect of Distilled water and Jatamansi on locomotor activity in actophotometer apparatus.
Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

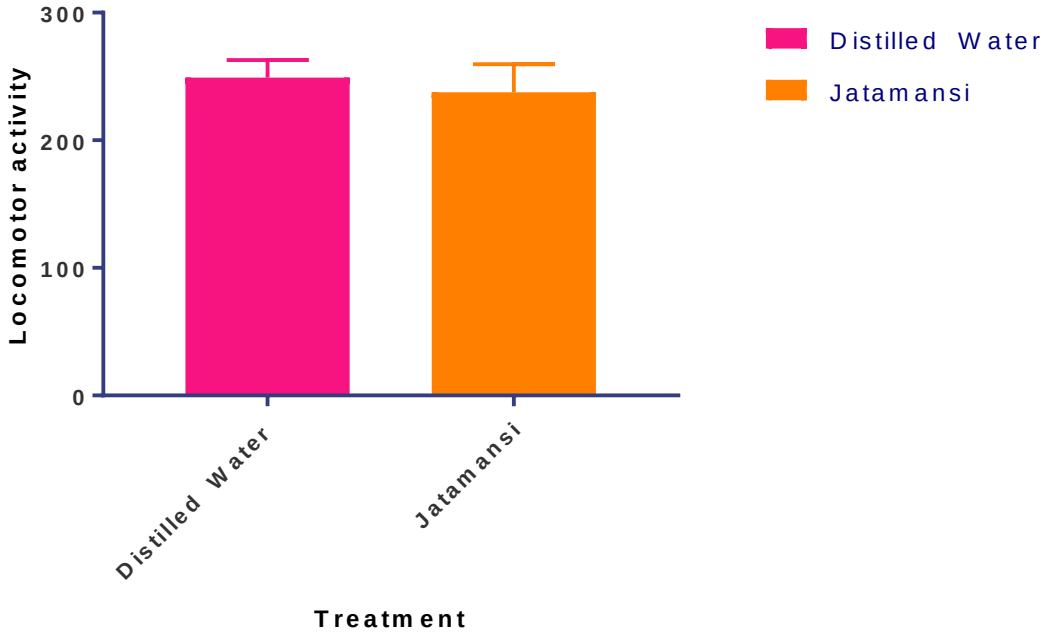

Fig. 3 Effect of Distilled water and Jatamansi on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. Distilled water treated rat groups showed no significant difference in locomotor activity of actophotometer apparatus as compared to Jatamansi (200 mg/kg, p.o.) treated rat groups, (p value 0.6664).

Treatment	**Dexamethasone**	**Haloperidol**	**Jatamansi**
Value	380.83±45.31	204.17±7.83	237.67±21.93

Table. 4 Effect of Dexamethasone, Haloperidol and Jatamansi on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

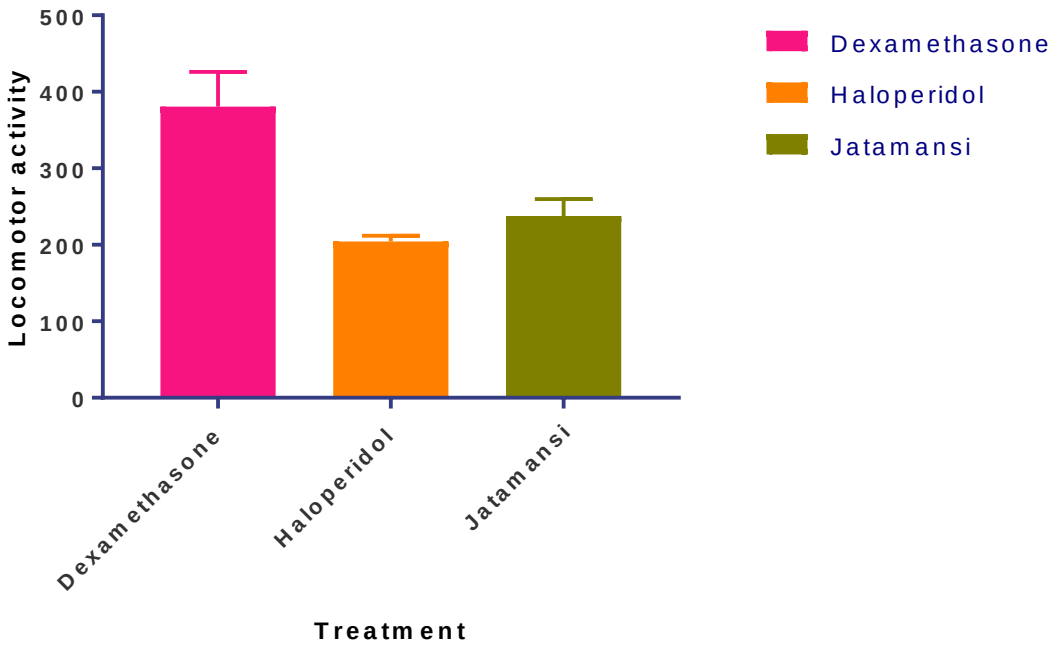

Fig. 4 Effect of Dexamethasone, Haloperidol and Jatamansi on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. Dexamethasone (2 mg/kg, i.p.) treated rat groups showed a significantly difference in locomotor activity in actophotometer apparatus as compared to Haloperidol (1 mg/kg, i.p.) treated rat group, (p value 0.0014) and also Dexamethasone (2 mg/kg, i.p.) treated rat groups showed a significantly difference in number of locomotor activity in actophotometer apparatus as compared to Jatamansi (200 mg/kg, p.o.) treated rat groups (p value 0.0068).

Treatment	**Dexamethasone**	**Dexa+Halo+Jata**
Value	380.83±45.31	258.83±19.12

Table. 5 Effect of Dexamethasone and Dexamethasone+Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

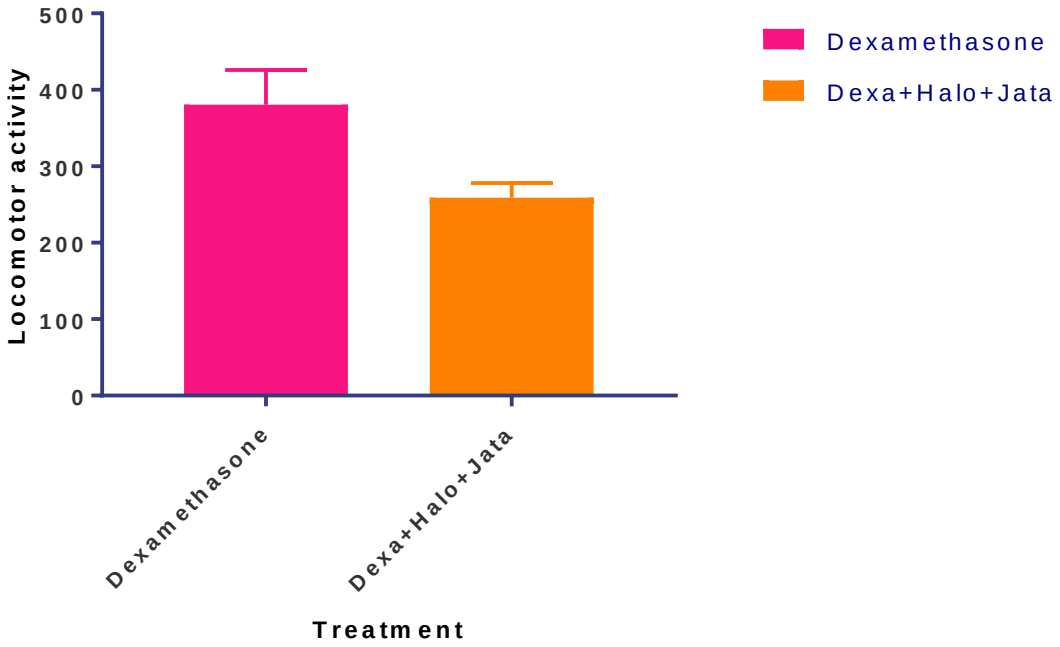

Fig. 5 Effect of Dexamethasone and Dexamethasone+Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. Dexamethasone (2 mg/kg, i.p.) treated rat groups showed a significant difference in locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups (p value 0.0325).

Treatment	**Halo+Jata**	**Dexa+Halo+Jata**
Value	194.67±12.45	258.83±19.12

Table. 6 Effect of Haloperidol+Jatamansi and Dexamethasone+Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.
Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

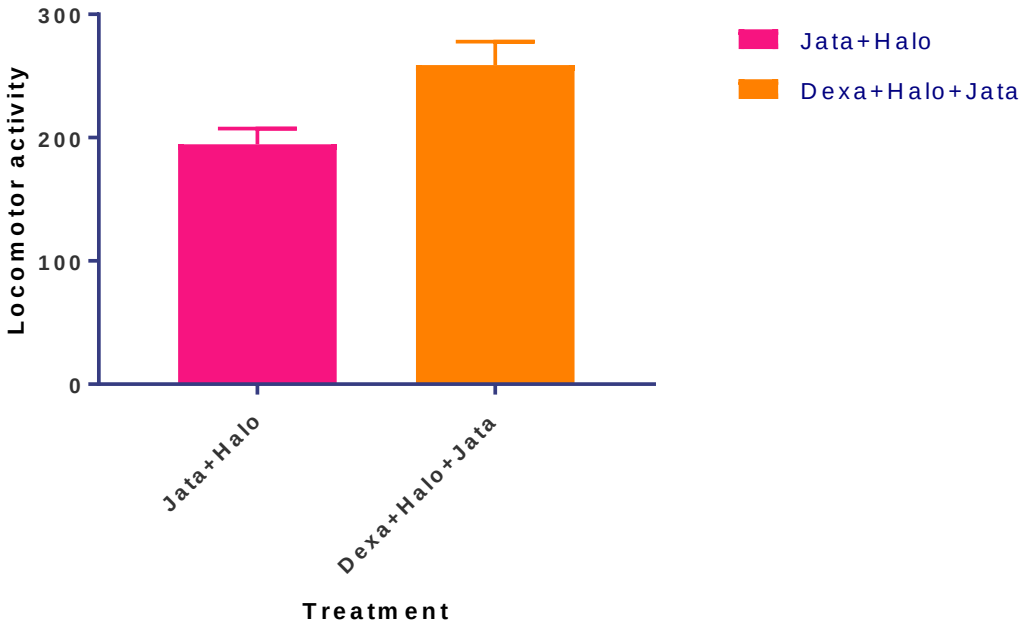

Fig. 6 Effect of Haloperidol+Jatamansi and Dexamethasone+Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups showed significant difference in number of locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups (p value 0.0188).

Treatment	**Jatamansi**	**Haloperidol**	**Halo+Jata**
Value	237.67±21.93	204.17±7.83	194.67±12.45

Table. 7 Effect of Jatamansi, Haloperidol and Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

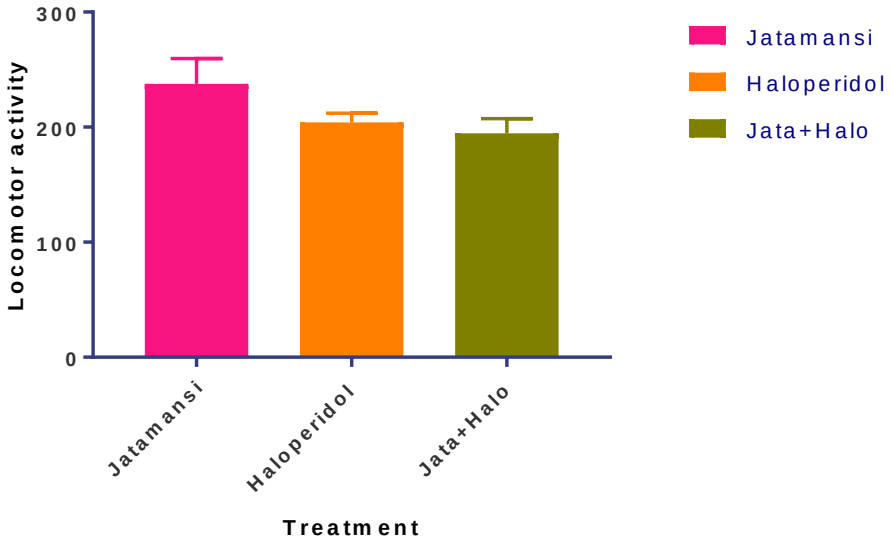

Fig. 7 Effect of Jatamansi, Haloperidol and Haloperidol+Jatamansi on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day. Jatamansi (200 mg/kg, p.o.) treated rat groups showed no significant difference in locomotor activity in actophotometer apparatus as compared to Haloperidol (1 mg/kg, i.p.) treated rat group, (p value 0.2404) and also to Haloperidol (1 mg/k, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups (p value 0.1151).

Treatment	Dexa+Jata	Dexa+Halo	Dexa+Jata+Halo
Value	269.5±17.50	259.5±15.51	258.83+19.12

Table. 8 Effect of Dexamethasone+Jatamansi, Dexamethasone+Haloperidol and Dexamethasone+Jatamansi+Haloperidol on locomotor activity in actophotometer apparatus.

Each value are expressed as mean ± SEM of locomotor activity obtained from actophotometer psychotic test conducted on one day.

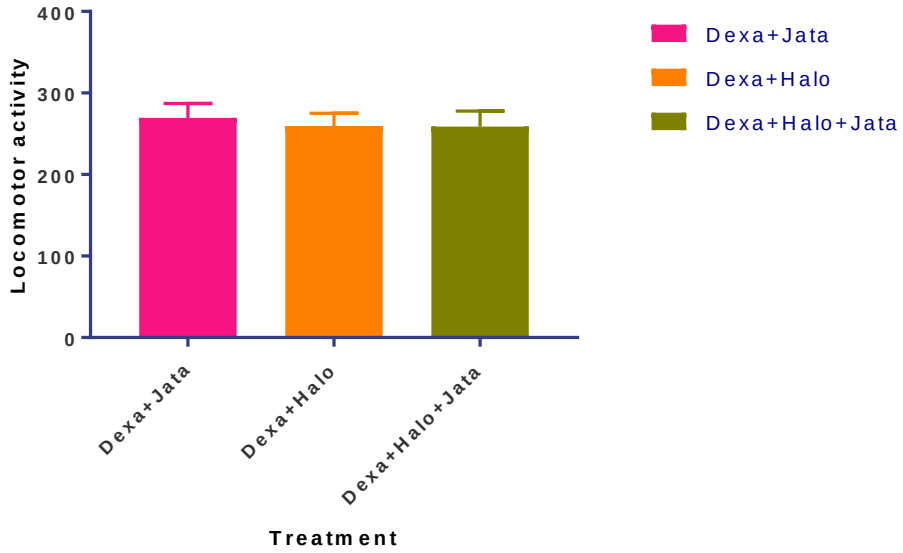

Fig. 8 Effect of Dexamethasone+Jatamansi, Dexamethasone+Haloperidol and Dexamethasone+Jatamansi+Haloperidol on locomotor activity in actophotometer apparatus.

Each value of locomotor activity is the mean value obtained from actophotometer psychostic test conducted on one day**.** Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups showed no significantly difference in locomotor activity in actophotometer apparatus as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) treated rat groups (p value 0.8885). Dexamethasone (2 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups showed no significantly difference in locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.) + Haloperidol (1 mg/kg, i.p.) + Jatamansi (200 mg/kg, p.o.) treated rat groups (p value 0.8744) in actophotometer apparatus.

IV. DISCUSSION

In the present study, the psychotic activity of jatamansi against dexamethasone induced psychosis in rats was studied by using actophotometer apparatus, to test the locomotor activity. When the animals decrease the number of locomotor activity, it indicates the neuroleptic effect (antipsychotic effect). When the animals increase the number of locomotor activity, it indicates psychosis in animals.

Control group (Distilled water & Normal saline treated rat group) showed no significant difference in their locomotor activity during locomotor test. This result shows that Distilled water & Normal saline not effect the locomotor activity of rats.

Dexamethasone (2 mg/kg, i.p.) treated rat group was significantly increasing number of locomotor activity as compared to Normal saline treated rat group. This indicates that the Dexamethasone induce psychosis in rats due to disturbance in dopamine neurotransmitter in brain. In response to stress, glucocorticoid release is increased and psychiatric disturbance are frequently observed in patient suffering from glucocorticoid excess (Sonino et al., 2010). This is due to impairment of dopamine-mediated neurotransmission (Soliman et al., 2012). The excess of glucocorticoid affect the messenger ribonucleic acid (mRNA) expression and distribution of dopamine (D_1R & D_2R). After dexamethasone administration, D_1R expression is decreased in cortical & straital region and increased level of dopamine in the synaptic cleft. Prolonged treatment with dexamethasone may increase the synthesis and storage of dopamine in vasicular and thus increase dopamine outflow in the cortex (Minton et al., 2009).

Haloperidol (1 mg/kg, i.p.) (reference drug) treated rat group was significantly decreasing number of locomotor activity in actophotometer apparatus as compared to Normal saline treated rat group, trial conducted on only one day. This result showed that Haloperidol decrease the psychosis in rats.

Jatamansi (200 mg/kg, p.o.) treated rat group was found decreasing number of locomotor activity as compared to Distilled water treated rat group, during trial conducted on one day. Jatamansi (200 mg/kg, p.o.) treated rat group was found increasing number of locomotor activity as compared to Haloperidol (1 mg/kg, i.p.) treated rat group, during trial conducted on one day.

Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.) treated rat group was found decreasing number of locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.) treated rat group, during trial conducted on one day. Jatamansi (200 mg/kg, p.o.) treated rat group was found increasing locomotor activity as compared to Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.) treated rat group, during trial conducted on one day. Dexamethasone (2 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group was significantly increasing number of locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.) & Dexamethasone (2 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.). This result shows that Jatamansi (200 mg/kg, i.p.) decrease the locomotor activity but not potent as to Haloperidol (1 mg/kg, i.p.).

V. SUMMARY AND CONCLUSION

The present study is designed to investigate the antipsychotic activity of *Nardostachys jatamansi* against Dexamethasone induced psychosis in rats by using actophotometer apparatus.

In actophotometer apparatus, habituate the animal for 10-15 minutes and returned to their cage. Placed the individual animal for 10 minutes, after drug administration & note the locomotor activity. The rat ability to climb in wire mesh side cage and locomotion in actophotometer was assessed high & it indicates the psychotic behaviour in rats.

The following silent findings may be summarized on the basis of result obtained in present study.

- Control treated rat group (Distilled water & Normal saline) showed no significant difference in locomotor activity.

- Dexamethasone (2 mg/kg, i.p.) treated rat group showed a significant difference in locomotor activity as compared to Normal saline treated rat group. This result shows that Dexamethasone (2 mg/kg, i.p.) induced psychosis in rat due to neurodegeneration.

- Dexamethasone (2 mg/kg, i.p.) treated rat group showed a significant difference in locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group. This result shows that Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group more decrease the locomotor activity against Dexamethasone (2 mg/kg, i.p.) treated rat group, which induce psychosis in rats.

- Dexamethasone (2 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group showed no significant difference in locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.) & Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.). This result shows that Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group produce synergetic effect against Dexamethasone (2 mg/kg, i.p.) induced psychosis in rats.

- Haloperidol (1 mg/kg, i.p.) treated rat group showed no significant difference in locomotor activity as compared to Normal saline treated rat group. This result shows that Haloperidol (1 mg/kg, i.p.) produce neuroleptic effect in rats.

- Jatamansi (200 mg/kg, p.o.) treated rat group showed no significant difference in locomotor activity as compared to Distilled water. This result shows that Jatamansi (200 mg/kg, p.o.) not produces neuroleptic effect in locomotor activity.

- Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.) treated rat group showed significant difference in locomotor activity as compared to Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group. This result shows that Jatamansi (200 mg/kg, p.o.)+Haloperidol (1 mg/kg, i.p.) treated rat group was antipsychotic effect against Dexamethasone (2 mg/kg, i.p.)+Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group.

- Jatamansi (200 mg/kg, p.o.) treated rat group showed no significant difference in locomotor activity as compared to Haloperidol (1 mg/kg, i.p.) & Haloperidol (1 mg/kg, i.p.)+Jatamansi (200 mg/kg, p.o.) treated rat group. This result shows that Jatamansi treated rat group produce neuroleptic effect but less potent to Haloperidol treated rat group.

Finally, it may be concluded that Jatamansi (200 mg/kg) exert antipsychotic effect against dexamethasone induced psychosis in rats. The antipsychotic effect of Jatamansi may be due to neuroprotective effect. Jatamansi is less potent to Haloperidol but in combination produce synergetic antipsychotic activity against Dexamethasone induced psychosis in rats.

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