EFFECT OF PANCHGAVYA ON CENTRAL ACTIONS IN ALBINO RATS

Ritu Paliwal1*, Y. P. Sahni2, Swatantra K. Singh3 and Sulochana Sen4

1 In-charge Laboratory Animal, BIONEEDS-Preclinical Services and Drug Testing Laboratory, Bangalore
2 Director Research Services, NDVSU, Jabalpur
3 Assistant Professor, Pharmacology and Toxicology, COVSc&A.H., Rewa
4 PhD Scholar, NDRI, Karnal

ABSTRACT

The ancient ayurvedic literature including Vir Charak Samhita, Sushrut and Gad Nigrah suggests a number of pharmacological applications of the substances obtained from Panchgavya. Panchgavya (PG) is combination of five major substances obtained from cow that includes cow dung, urine, milk, curd and ghee. All these five products of PG have been claimed to possess medicinal properties against several disorders such as renal disorders, arthritis, hyperlipidemia, immunosuppression and stress. In the present study PG obtained from CCRAS, New Delhi was evaluated for central actions in albino rats. PG was administered orally at the dose rate of 50 mg per rat for 30 consecutive days. The experiment was designed in different groups of rats consisting six rats in each group including control and various treatments. The central actions of PG was determined on Spontaneous Motor Activity, muscle tone and pain by actophotometer, rota rota rod test and hot plate method respectively in rats.

Keywords: Panchgavya, Central action, Albino rats.

INTRODUCTION

Panchgavya is the combination of five major substances obtained from cow that includes milk, ghee, curd, urine and dung. All the five products possess medicinal properties against many disorders and are used for the medicinal purpose singly or in combination with some other herbs. This kind of treatment is called Panchgavya therapy or cowpathy [1].

The ancient ayurvedic literature including Vir Charak Samhita, Sushrut and Gad Nigrah suggests a number of pharmacological applications of the substances obtained from Panchgavya. These substances are abundantly used in Ayurveda for treatment of several disorders such as leucoderma, hyperlipidemia, arthritis, renal disorders, dietary disorders, gastrointestinal disorders, acidity, asthma and as an antistressor. Panchgavya acts as a general tonic or immunomodulator to enhance the immunity of animals [2] [3]. These remedies seem to be potent anticancer and anti HIV agents [4]. In poultry, it is given along...
with water to have better protection against diseases and to increase both quality and quantity of eggs \cite{5}. Cowpathy is used to encounter deleterious effects of pollutants in food chain such as feeds containing pesticide, heavy metal or mycotoxin residues and to maintain good health of animals and birds \cite{1}. Recently, cow urine has been granted U.S. Patents (No. 6410059 and 6896907) for its medicinal properties, particularly for its use along with antibiotics for the control of bacterial infections and fight against cancers. Cow urine has been claimed to act as an anti-oxidant, antistressor, anti-toxin, anti-allergic and as bioenhancer. A systematic work needs to be carried out on biological activity and pharmaceutical aspects of Panchgavya to validate its medicinal properties.

**MATERIAL AND METHODS**

**Experimental Animals**

The study was conducted on 42 adult healthy albino rats of either sex weighing between 150-200 gm. The experiment was approved by the Institutional Animal Ethics Committee of College of Veterinary Sciences and Animal Husbandry, Madhya Pradesh Pashu Chikitsa Vishwa Vigyan Vishwa Vidyalaya, Jabalpur and all the protocols were followed according to the guidelines directed by the Committee for the Purpose of Control and Supervision of Experiments of Animals (CPCSEA). Before the start of the experiment, rats were kept in laboratory conditions for a period of 7 days for acclimatization. All the experimental animals were kept under constant observations during the entire period of study. The rats were maintained with good hygienic conditions and provided with standard feed and water ad libitum.

**Procurement of Panchgavya**

Panchgavya was obtained from Central Council for Research in Ayurveda and Siddha (CCRAS), New Delhi. Panchgavya was administered orally for 30 consecutive days at the dose rate of 50 mg per rat in different groups of rats consisting of six rats in each group as follows.

**Effects of Panchgavya on Central Actions**

Effects of Panchgavya on central actions viz. pain (algesia), muscle tone and Spontaneous Motor Activity (SMA) in rats was recorded as follows.

**Evaluation of Panchgavya on Pain**
Analgesic activity of Panchgavya was studied by using hot plate analgesiometer as per the method described by kulkarni [6]. The rat was placed on the hot plate of analgesiometer heated up to 55±0.5°C. The time between putting the rat on hot plate and start of licking hind paw, was taken as reaction time or latent period for analgesic activity. Panchgavya was given daily orally for 30 days. Observations were recorded on day 0, day 15 and day 30 of experiment.

Evaluation of Panchgavya on Muscle Tone
The effect of Panchgavya on muscle tone was evaluated by Rota rod apparatus as per the method described by Kulkarni [6].

Evaluation of Panchgavya on SMA
The SMA in rats was measured by Actophotometer as per the method described by Kulkarni [6]. The rats were kept in Actophotometer for 10 min to observe their cumulative count. The second observation was taken after 30 min of first observation. The percent change in activity was measured.

Statistical Analysis
The data generated under various experiments were subjected to analysis of variance (ANOVA) using complete randomized design with interaction. Mean and standard error were obtained as per standard procedure. Each parameter was analyzed by using the method of complete randomized design with treatments allotted to the group of 6 animals each. Treatments were tested statistically for their significance [7].

RESULTS
Effect of Panchgavya on Central Actions
The central actions of Panchgavya on muscle tone and Spontaneous Motor Activity (SMA) were evaluated in rats by rota rod and actophotometer. In addition analgesic activity of Panchgavya was also determined by hot plate analgesiometer. The results have been depicted in Table 1, Table 2 and Table 3.

The central action of Panchgavya on muscle tone activity in albino rats was evaluated on day 0 (pre treatment), day 15 and day 30 (post treatment) of the experiment. The muscle tone activity was 4.84±0.22 min on day 0 (pre treatment) which increased significantly with Panchgavya as 6.87±0.02 min. on day 15 and 9.49±0.34 min on day 30 (post
treatment). The results indicated significant increase in muscle tone activity with Panchgavya.

The central action of Panchgavya on pain in albino rats was evaluated on day 0 (pre treatment), day 15 and day 30 (post treatment) of the experiment. The reaction time was 3.83±0.31 sec on day 0 (pre treatment) which increased significantly with Panchgavya as 6.00±0.52 sec on day 15 and 7.50±0.22 sec on day 30 (post treatment). The results indicated significant analgesic activity of Panchgavya on contact heat induced by hot plate analgesiometer.

Similarly the central action of Panchgavya on spontaneous motor activity in albino rats was determined on day 0 (pre treatment), day 15 and day 30 (post treatment) of the experiment. The cumulative count of SMA was 720 on day 0 (pre treatment) which reduced significantly with Panchgavya as 412.5 on day 15 and 289 on day 30 (post treatment). The results indicated significant decrease in SMA with Panchgavya.

**TABLE 1: MEAN VALUES OF MUSCLE TONE ACTIVITY (MINUTES) IN ALBINO RATS TREATED WITH PANCHGAVYA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group III Panchgavya (50mg/rat) daily for 30 days</th>
<th>CD at P&lt;0.01</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean values ± SE</td>
<td>CD at P&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>Day 0</td>
<td>Day 15</td>
</tr>
<tr>
<td>Muscle tone activity (minutes)</td>
<td>4.84±0.22</td>
<td>6.87±0.20</td>
</tr>
</tbody>
</table>

**TABLE 2: MEAN VALUES OF REACTION TIME (SECONDS) IN ALBINO RATS TREATED WITH PANCHGAVYA FOR ANALGESIC ACTIVITY**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group III Panchgavya (50mg/rat) daily for 30 days</th>
<th>Percent increase in analgesic activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean values ± SE</td>
<td>Day 0</td>
</tr>
<tr>
<td></td>
<td>Day 0</td>
<td>Day 15</td>
</tr>
<tr>
<td>Reaction time (seconds) for analgesic activity</td>
<td>3.83±0.31</td>
<td>6.00±0.52</td>
</tr>
</tbody>
</table>

Values are mean of six observations.

The mean values with different alphabets as superscript in a column differ significantly from each other, SE: Standard Error;
### TABLE 3: MEAN VALUES OF SPONTANEOUS MOTOR ACTIVITY (CUMULATIVE COUNT) IN ALBINO RATS TREATED WITH PANCHGAVYA

<table>
<thead>
<tr>
<th>Group III Panchgavya (50mg/rat, daily for 30 days)</th>
<th>Time interval</th>
<th>Spontaneous Motor Activity (cumulative count)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day 0</td>
<td>Day 15</td>
</tr>
<tr>
<td>30 min after Panchgavya administration</td>
<td>752</td>
<td>493</td>
</tr>
<tr>
<td>60 min after Panchgavya administration</td>
<td>688</td>
<td>332</td>
</tr>
<tr>
<td>Average cumulative count</td>
<td>720</td>
<td>412.5</td>
</tr>
</tbody>
</table>

Values are mean of six observations

**DISCUSSION**

The pharmacological evaluation of Panchgavya on central nervous system was also determined in the present study. The efficacy of Panchgavya on central nervous system was assessed on muscle tone, Spontaneous Motor Activity (SMA) and heat induced algesia in albino rats. The observations were recorded at different time intervals on oral administration of Panchgavya (50 mg/rat, orally) daily for 30 consecutive days. The findings indicated a gradual increase in the muscle tone activity from 4.84±0.22 min on day 0 to 6.87±0.20 min on day 15 and 9.49±0.34 min on day 30. A report published by Achliya [8], indicated the effect of cow ghee containing ayurvedic preparation Unmadnashak ghrita on muscle tone activity evaluated by rota rod performance and suggested a significant increase in muscle tone activity by Unmadnashak ghrita.

However, Panchgavya exhibited a reduction in SMA on day 30 post treatment. The reports of Achliya [9] and Achliya [8] also mentioned reduction in SMA on oral administration of Bramhi ghrita and Unmadnashak ghrita respectively containing Panchgavya component cow ghee. The aforementioned reports of various co-authors are in close agreement to our findings indicating the effects of Panchgavya on muscle tone and SMA.

The efficacy of Panchgavya on heat induced algesia was also evaluated by using hot plate analgesiometer as per the method described by Kulkarni [6]. The observations were recorded on day 0 (pre-treatment), day 15 and day 30 (post treatment) after oral administration of Panchgavya (50 mg/rat) for 30 consecutive days. The findings indicated
a gradual increase in analgesic activity in terms of reaction time from 3.83±0.31 sec on
day 0 to 6.00±0.52 sec on day 15 with 36 percent increase in analgesic activity and
7.50±0.22 sec on day 30 (post treatment) with 48 percent increase in analgesic activity.
Achliya [9] also studied the effect of Bramhi ghrita on nociception (pain) by tail flick
analgesiometer and reported that Bramhi ghrita caused a significant increase in reaction
time on its oral administration in the dose of 500 mg/kg. The present study also
substantiates the work of Achliya [9] suggesting the analgesic activity of Panchgavya on
its oral administration for 30 consecutive days. The detailed study is needed to find out
the involvement of pain mediators on analgesic activity of Panchgavya to further explore
its mechanism of action.

REFERENCES

   wisdom & modern science. The Indian cow. 23: 2-22.
   Study of immunomostimulant activity of Ashtamangal ghrita in rats. Indian J.
   immunomodulatory activity of Haridradi ghrita in rats. Indian J. Pharmacol.,
   35: 51-54.
   on immunity of White Leghorn layers. The Indian cow, 2: 45-48.
   anticonvulsant activities of Unmadnashak Ghrita. J. Ethnopharmacol., 94(1): 77-
   83.

For Correspondence:
Dr. Ritu Paliwal
Email: divyanshu.paliwal@gmail.com