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Acute toxicological study of folklore drug Commiphora Caudata (Wight & Arn.)

Research Article

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Abstract

In Ayurvedic medical science medicinal plants are considered as the base for treating the illness. The wide uses of medicinal plants are seen since historical period where ancient *Acharyas* have documented many of them in various ailments. But recent studies shows that many of the drugs are exploited and it should be taken care immediately to avoid shortage, which can be done through either conservation or substitution. Here the plant *Commiphora caudate* (Wight & Arn.) is a folklore drug which is used in inflammatory conditions by traditional healers. Hence it is taken to assess the acute toxicity of the drug and the study shows that the oral administration of the *Swarasa* of the drug *Commiphora caudata* (Wight & Arn.) considered to be safe as it didn't exhibit any adverse effect in acute toxicological study on albino rats.

Key Words: Toxicology, Folklore drug, *Commiphora caudata (Wight & Arn.)*.

Introduction

In Ayurvedic system of medicine plants have been the basis for medical treatments through much of human history, and such traditional medicine is still practiced today and also the use of plant is well rooted in medical practice. Traditional healers from ancient periods methodically developed well-defined pharmacopoeias to treat a variety of ailments.

Even though having much awareness about NSAIDS untoward side effects, people are not much keen to use herbal remedies as NSAIDS gives speedy relief. There are abundant numbers of drugs which are having anti-inflammatory action which has been furnished in our ancient text, some of them which may have more potent than NSAIDS, which should be screened out through various researches.

In Ayurveda any inflammation or swelling is called as *Shotha*. The drugs which are used to reduce this symptoms are called as *Shothahara or Shothagna*. In classical text, drugs as such as *Bruhatpanchamoola*, *Lagupanchamoola* and even many single herbal drugs such as *Sudarsana*, *Eranda* etc. are explained as *Shothahara* in different context. Even though there are many available classical herbal drugs for the treatment of *Shotha*, Because of huge demand, many of the drugs are exploited. So it is necessary to find the exact substitutes to overcome this issues, where folklore drugs can be considered to address this area.

The drug *Commiphora caudata* (Wight & Arn.) is a medium sized tree belongs to Burseraceae family commonly found in Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, and in Srilanka. This plant is proven for its Antispasmodic activity, Hypothermic activity, Analgesic(1)(2)(3)(4). The leaf paste of this plant is applied externally in swelling and inflammation, which is widely practised by few traditional healers for acute inflammation, found reference from *Koothuparampu, Kanoor* district in *Kerala.* The plant is seen abundant and easily available, which is even economical too. So before proceeding it for studying the clinical aspects of the drug, it is very important know the toxicological aspect, as it is said to be a folklore drug. Hence the acute toxicity of the drug is widely studied.

Aims and Objectives

The main aim of the study was to find whether the drug is having any toxic effect when it is given orally. The objective was to study the acute toxicological aspect as well as the behavioural changes in the albino's model by giving the leaf extract of *Commiphora caudata* (Wight & Arn.). Single dose and observation done at different time intervals.

Materials and methods

Acute oral toxicity study has been done on the basis of Organization for Economic Cooperation and

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Development guidelines (5) guidelines for the testing of chemicals.

Instruments used

Weighing scale, needle, syringe, Rat Feeding Needles, mono pan balance, oral feeding needle, rubber catheter, mortar & pestle.

Drugs:

Trail group: Leaf *Swarasa* of *Commiphora caudata* (Wight & Arn.)
Control group: Tap water

Selection of Animals:

12 number of healthy albino rats of either sex**,** weighing between 150-200gms were collected from the animal house working in the Alva's Ayurveda Medical College, Moodabidri. The animals were housed under standard laboratory condition, identical feeding and management practices. They were acclimatized at laboratory hygienic condition for 15 days before starting the experiment. The animal study was conducted at the animal house of Alva's Ayurveda Medical College, Moodabidri, after the approval from the institutional animal ethics committee.

Dose Selection

As per the Organization for Economic Cooperation and Development (OECD 425) guidelines the maximum limit test dose for acute toxicity studies is 5000mg/kg body weight, i.e. 5ml/kg (6)

Drug preparation

Samples of the leaves of *Commiphora caudate* (Wight & Arn.) were collected from *Cannanoor* District, Kerala and officially identified by botanist.

Preparation of the *Swarasa (juice)* – As per classical reference *Sarangadhara samhita*(7), the fresh leaves of *Commiphora caudata* (Wight & Arn.) were grinded in *kalvayantra (mortar and pestel),* taken in a cloth and squeezed to get the *swarasa*.

Route of Drug Administration

The trail drug and control drug were administered according to the body weight of the animals by oral route with the help of oral feeding needle.

Grouping

The rats were weighed, divided into trial and control groups with 6 animals in each group.

Procedure

The oral acute toxicity study of *Swarasa* of *Commiphora caudata*(Wight & Arn.) was evaluated on Albino rats were the limit test dose of 5ml/kg according to the Organization for Economic Cooperation and Development (OECD) guidelines. All animals (both test and control groups) were kept fasting overnight, with free access to water before starting the experiment. The control group were then served with tap water and the trial group received the *Swarasa* of *Commiphora caudata*(Wight & Arn.) at dose of 5ml/kg. The animals were observed for any toxic effects for first 4 hours after treatment. Further animal were studied for a period of three days for any toxic effect or behavioural changes and other parameters such as body weight, urination, food intake, water intake, respiration, convulsions, tremors, temperature, constipation, change in eye and skin colour etc.

Observations and Results

After administrating the drug orally the animals are observed very hour for first four hours later observed at 24th hour, 48th hour and 72nd hours respectively. No treatment related toxic symptoms or mortality were observed after oral administration of *Swarasa Commiphora caudata*(Wight & Arn.) at a dose of 5ml/kg body weight. The general behaviour of the trial group and control group was observed for first 4 hours followed by long period of 72 hours, did not show any symptoms of toxicity. The parameters observed for acute toxicity study compared with control group are presented in table no. 1

Table: 1: General appearance and behavioural observations of acute toxicity study for control and treated groups

Observation	Control group		Trial group 5ml/kg	
	Before(0th hour)	After(72nd hour)	Before(0th hour)	After(72nd hour)
Body weight	198.39±5.08gm	194.57±3.40gm	194.89±4.54gm	187.64±3.20gm
Temperature	37.5±0.2°C	37.6±0.1°C	37.7±0.1°C	37.2±0.3°C
Food intake	30gm/day (multigrain flour pellet)	29gm/day (multigrain flour pellet)	30gm/day (multigrain flour pellet)	28gm/day (multigrain flour pellet)
Urination	4.62±0.05ml/24hrs	4.53±0.25ml/24hrs	4.71±0.04ml/24hrs	4.49±0.37ml/24hrs
Rate of respiration	82±4breaths/min	91±3breaths/min	88±4breaths/min	94±1breaths/min
Skin colour	White	White	White	White
Drowsiness	Not present	Not present	Not present	Not present
Eye colour	Red(Normal)	Red(Normal)	Red(Normal)	Red(Normal)
Diarrhoea	Not present	Not present	Not present	Not present
Coma	Not present	Not present	Not present	Not present
Death	Alive	Alive	Alive	Alive

As per the table no. 2, it shows that all the animals are survived without showing any toxicity symptoms.

Table no. 2: Data related to no. of animals showing toxicity symptoms at different time intervals

Group	Dose	CNS DEPRESSION							CNS STIMULATION						
		1hr	2hr	3hr	4hr	24hr	48hr	72hr	1hr	2hr	3hr	4hr	24hr	48hr	72hr
Trial	5ml /kg -bd wt	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6
Control	Tap water	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6	0*/6

6 – Total number of animals included in the study
*** - No. of animals exhibited toxicity signs**

Discussion

Commiphora caudata (Wight & Arn.) is a folklore drug which is widely used by traditional practitioners for its potent action on reducing the inflammation, there is no much evidence regarding the effectiveness and the safety of the drug. So to evaluate the safety and the acute toxicity of the drug *Commiphora caudata* (Wight & Arn.), the study has been carried out. In the present study after administrating the drug orally, the animals are observed every hour for first four hours later observed at 24th hour, 48th hour and 72nd hours respectively, several parameters were assessed to study the acute toxicity. In general appearance and behavioural observations of acute toxicity study for control and treated groups, it shows there were no significant changes in body weight, temperature, food intake, urination, and respiration rate. In acute toxicity study administration of single dose of 5ml/kg body weight did not show any symptoms of toxicity or mortality such as change of skin colour, eye colour, drowsiness, diarrhoea, coma and death during the entire observation period. Therefore the approximate lethal dose (LD_{50}) of the drug *Commiphora caudata* (Wight & Arn.) is estimated to be greater than 5ml/kg body weight and is nontoxic at this dose level.

Conclusion

The present study shows that the oral administration of the *Swarasa* of the drug *Commiphora caudata* (Wight & Arn.) considered to be safe as it didn't exhibit any adverse effect in acute toxicological study on albino rats. Pharmacological experiments are generally based on animal organs or tissues. As such it is not expected to find these experimental findings correlating with human therapeutics in exact manner. So further detailed evaluation of chronic toxicity study can be done to have a better understanding of safety of the drug.

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