IAMJ

Review Article International Ayurvedic Medical Journal ISSN:2320 5091

ACUTE TOXICITY STUDY OF SEED KERNEL OF MANGIFERA INDICA LINN (SKMI)

Ashalatha M[1], Shivakumar[2], Suresh janadri[3], Shyla RJB yoganand[4]

[1]Professor and HOD, [2]PG Scholar, [4]Professor, Department of PG Studies in Dravyaguna, Government Ayurveda medical college, [3]Assistant professor; Department of pharmacology Acharya & BM Reddy College of Pharmacy, Bangalore, Karnataka, India

ABSTRACT

With the globalization of Ayurveda it is need of the time to prove the available data in texts on scientific basis through experiments. In ancient Ayurvedic literature many references are available regarding drug testing on animals for safety of mankind. In *Charaka samhita* it has been explained to test the food whether it is poisonous or not by testing on fire and by reaction of different birds and animals after consuming or merely seeing the poisonous substances. In *Sushruta Samhita Kalpashtana* there is similar reference dealing with observations animal experiments. *Acharya Vagbhata in Ashtanga Hridayam Sutrasthana* has also explained the same. The Mango fruit is commonly eaten by human beings and seed is thrown out considering it as waste, but there is reference about medicinal value of amrabeejamajja1 *(Mangifera indica*, Linn) in Ayurveda current study is taken to evaluate its effect. As per OECD 423 guidelines acute toxicity study was conducted and this drug proved to be non-toxic.

Keywords: *Amrabeejamajja, Mangifera indica*

INTRODUCTION

Indigenous system of medicine namely *Ayurveda*, has been existing since centuries. In recent years *Ayurvedic* drugs have kindled interest, on account of their efficacy for curing several human ailments with little or no adverse effects if properly administered. But still there is lack of data on efficacy, safety and toxicity of herbal drugs. Hence there is need to find herbal drugs which are effective, freely available, economical, producing minimum ADR's and toxic effects. The seed kernel of *Amra(Mangifera Indica.*Linn*)* is of *kashaya rasa pradhana, rukshaguna, sheeta virya, katu vipaka, atisaranashana chardinashana,* and *hrudayadahanashana*[1,2]. The literature survey reveals that the seed kernel is rich source of natural antioxidants, nutrients, fat, starch and protein, and reported to have antidiabetic, anti-inflammatory, antiviral, antibacterial, cardioprotective and antimutagenic activities.

AIMS AND OBJECTIVES OF THE STUDY

To study the acute toxicity of seed kernel of *Mangifera Indica.*Linn

MATERIALS AND METHODS

The Seeds of *Mangifera Indica.*Linn were collected from fruit vendour at Rajajinagar Bangalore. Seeds were carefully checked for the presence of infested ones and after removing them, washed with water to remove dust. Seed cover removed and seed kernel was collected and Sample was then dried under shade. Completely dried seed kernels were then pounded to convert them into fine powder and sieved and preserved in air-tight food grade plastic containers. Powder thus obtained was used for preliminary phyto-

chemical analysis and toxicological studies. Healthy female albino mice three in number were selected for the study. The standard guidelines for the housing and feeding of the animals mentioned in the OECD Guidelines were followed. Approval was obtained from Institutional Animal Ethics Committee (IAEC) with reference no: IAEC/ABMRCP/2014-15/05 dated 28/06/2014.

The study was carried out for a total period of 14 days following the OECD guidelines no.423[3].

Preparation of animals: The albino mice were procured from Acharya & BM Reddy college of pharmacy Bangalore, marked to permit individual identification, and kept in their cages for at least 5 days prior to dosing to allow for acclimatization to the laboratory conditions. The temperature in the experimental animal room 22ºC (+ 3ºC) and Lighting was artificial, the sequence being 12 hours light, 12 hours dark. For feeding, conventional laboratory diet was used with an unlimited supply of drinking water.

Preparation of dosage form: Powder of SKMI dissolved in 1% w/v of carboxy methyl cellulose, prepared just prior to administration.

Administration of doses: The animals were made to fast overnight prior to dosing (withheld for 3-4 hours and Ad libitum) following which they were weighed, doses calculated according to body weight. Trial drug is proved to be non toxic with 50mg, 300mg and 2000mg/kg body weight in a single dose with oral gavage. Therefore the herbal drug is in powder form and has low toxicity hazard; acute toxicity is tried with 5,000 mg/kg body weight[3].The animals were withheld from food for a further 1-2 hours after administration of the doses.

TEST PROCEDURE:

- Three mice were used and marked accordingly.
- Single dose of 5,000 mg/kg body weight of SKMI powder was administered to each mice
- The animals were observed individually after dosing, at least once during the first 30 minutes then periodically up to 24 hours, with special attention given during the first 4 hours.
- They were observed daily thereafter for a 14 days.
- Absence of mortality indicates the drug belonging to Category 5

(Testing of animals in category 5 (5000mg/kg) is considered when there is a low toxicity hazard and that have direct relevance for protecting human or animal health.)

OBSERVATIONS AND RESULTS

The mice were observed for tremors, convulsions, salivation, diarrhea, lethargy, sleep, coma, changes in behavioural pattern and somatomotor activity. The respiratory, circulatory, autonomic and central nervous systems were also observed for any adverse symptoms. None of the experimental animals died during study period. Food and water consumption, nature of excreta and behaviour remained unaltered throughout study period. Observations during the first 30 minutes, 24 hours and 14 days showed no changes in any of the above mentioned parameters. There were no mortalities observed. After sacrificing mice stomach organ sent for histopathological evaluation and results showed no histopathological changes.

Table no: 1

Albino mice	Dose	Histopathological study of stomach	Changes in behavioural and somatomotor activity

1st mice	5000mg/kg body wt	Normal	No changes
2nd mice	5000mg/kg body wt	Normal	No changes
3rd mice	5000mg/kg body wt	Normal	No changes

Histopathological study of stomach of Mice

Figure 1: Normal histopatholgical study of all 3 mice

DISCUSSION

Purpose of choosing higher dosage of powder was to establish the safety of the test drug with respect to vital organs. Dose fixation was in accordance with OECD Guidelines. As this herbal drug in powder form is of low toxic hazard and didn't show toxicity till 2000mg/kg, toxic study was tried with 5000mg/kg[3]. None of the animals died during study period. Changes pertaining to their behaviour patterns were very vital to prove non-toxic nature of test drug. Absence of any abnormal behaviour with dose 5000mg/kg body weight and histopathological changes makes this powder safe for longer use with dose of 500mg/kg body weight.

CONCLUSION

Amrabeejamajja (SKMI) is practically non-toxic drug and its safety is thus established with the present study. SKMI powders in the dose up to 5g/kg didn't show any kind of variations in mice, so 1/10th part of 5gm/kg i.e.500mg/kg body wt. can be conveniently used for experimental study for longer duration

REFERENCES

1. Bhavamishra, "Bhavaprakasha Nighantu", commentary by Dr. Chunekar K.C, edited by Dr. Pandey G.S, Varanasi: Chaukambha Bharathi Academy, Reprint 1999.
2. Ayurvedic Pharmacopeia of India. Vol. 3. New Delhi: Govt. of India, Ministry of Health & Family welfare. Dept. of ISM&H; 2000.
3. OECD 423 guideline for the testing of chemicals; adopted on 17th December 2001, Acute Oral Toxicity-Acute toxic class method.
4. Kailash chaudra, B.G.Chaudhari, B.P. Dhar "Database on medicinal plants used in Ayurveda", Vol 5, CCRAS, 2007.
5. Vaidhya Baghel M.S., Researches in Ayurveda, Ed II, 2005. Jamnagar; Mridu Ayurvedic publications and sales.
6. Vogel. H.Gerhard, Drug discovery and evaluation, pharmacological assays, co-edited by Vogel.H.Wolfgang, *et.al*, 2nd edition, New York; Springer- Verlag Berlin Heidelberg.

CORRESPONDING AUTHOR

Dr. Shivakumar

Email: Shivahiremath60@gmail.com

Source of support: Nil
Conflict of interest: None Declared