EMPRO

Current Research in Pharmaceutical Sciences

Available online at www.crpsonline.com

crps online CRPS

ISSN 2250 – 2688

Received: 22/01/2013
Revised: 15/02/2013
Accepted: 29/02/2013

D Kumar, H V Hegde, R K Joshi, A K Sharma, S Roy
Regional Medical Research Centre (ICMR), Belgaum-590010, Karnataka, India

P A Patil
Department of Pharmacology, USM-KLE, Belgaum-590010, Karnataka, India

A K Sharma
Department of Pharmacy, GSVM Medical College, Kanpur-208002, Uttar Pradesh, India

Correspondence
D Kumar
Regional Medical Research Centre (ICMR), Belgaum-590010, Karnataka, India

E mail:
dushyant2007bms@gmail.com

Evaluation of Traditional Formulation for Anti-pyretic Activity in Milk Induce Pyrexia Model of Rabbits

D Kumar, H V Hegde, P A Patil, R K Joshi, A K Sharma and S Roy

ABSTRACT

A formulation of *Andrographis paniculata* is widely used by traditional healers for the treatment of fever in rural northern Karnataka. The present study was undertaken to evaluate the safety and efficacy of the formulation milk induced pyrexia model. After 1 hr intraperitonial administration of milk, decoction was given in the oral dose of 0.7 ml/kg, which, were shown to be significant in reducing reduced the elevated body temperature of rabbit.

Keywords: *Andrographis paniculata*, anti-pyretic, traditional formulation

1. INTRODUCTION

Traditional healers still play a significant role in health care delivery system, particularly in rural parts of India. A formulation of *Andrographis paniculata* is found to be widely used for the treatment of fever in rural northern Karnataka. *A. paniculata* belongs to Acanthaceae family and commonly known as Kalmegh. It is widely distributed throughout India in the plains, also in forest as under growth. Reported chemical constituents of *A. paniculata* are andrographolides and flavones [1]. Andrographolid was reported to be having antipyretic, anti-inflammatory and analgesic effects [2]. *A. paniculata* formulation has been reported as hepatoprotective against CCl_4 induced hepatotoxicity [3]. It has also been reported for antimalarial activity [4]. The chloroform extract of *A. paniculata* has been reported for antihyperglycemic and renal protective activities [5]. The present study was undertaken to evaluate the safety and efficacy of the traditionally used formulation "Milk induced pyrexia model".

2. MATERIALS AND METHODS

2.1 Materials

The plant incorporated in the formulation i.e. *A. paniculata* was authenticated and their voucher specimens (RMRC-0925) were deposited in the herbaria at Regional Medical Research Centre (ICMR), Belgaum. The parts of medicinal value from the plants were collected with the help of traditional practitioners.

2.2 Preparation of formulation

Five hundred grams of *A. paniculata* stem were ground to get coarse powder and macerated with five liters of distilled water for seven days. On 8th day, extract was filtered with muslin cloth and placed on hot water bath, until it reduced to 100 ml. This 100 ml concentrated liquid of *A. paniculata* contains approximately 31 g extract.

2.3 Animals

Albino rabbits of New Zealand strain of either sex weighing between 1.5-2.0 kg were procured from Shri Venkteshwara Traders, Bangalore 560021 India. They were housed in iron cages at room temperature (22 ± 3 ºC) in disturbance free room were fed with tap water and standard diet. The experiment was started after getting the approval from IAEC, constituted as per CPCSEA guidelines.

2.4 Drug and chemicals

Paracetamol (Calpol) was purchased from local medical shop manufactured by Glaxo Smith Kline Pharma Ltd. Mumbai.

2.5 Acute toxicity studies

Albino mice weighing 20-30 g were used in the study. After acclimatization for a week under laboratory condition, animals were fasted overnight which received a single oral dose (2000mg/kg) of herbal formulation and the observation were carried out as per OECD guidelines 423. The animals were observed for first 24 hours (with special attention during first 4 hrs) and intermittent observation was carried out for next 14 day. On 2nd day the experiment was repeated in two more animals and observation were carried out [6].

2.6 Antipyretic activity

After one week acclimatization to laboratory condition, animals were starved for 4-6 hrs prior of experimentation. Basal rectal temperatures were recorded by inserting a liquid paraffin lubricated animal's rectal thermometer up to 6 cm in the rectum. Once daily rectal temperature were taken for about a week and animals showing variation in the temperature ≥ 0.5ºF were not included in the study. After recording 0 hr rectal temperature boiled and cooled up to room temperature. It was injected intraperitoneally in the dose of 0.5ml/kg body weight to induce pyrexia in all three groups. Eighteen animals were divided in three groups (n=6). Milk injection group I (control) received 2% gum acacia solution group II (standard) received Paracetamol 150mg/kg bode weight and third group (test) received test formulation 0.7 ml/kg body weight. All treatments were administered in different assigned groups of animals after 1 hr of milk injection. Rectal temperature was recorded at 0.5, 1, 2, 3 and 4hrs after milk injection [7].

3. RESULTS & DISCUSSION

3.1 Stastical analysis

The results are expressed as Mean ± SEM, data was analyzed by one way ANOVA followed by Dunnett's *post hoc* test using graph pad software. *P* value ≤0.05 was considered as significant.

3.2 Acute toxicity studies

In acute toxicity studies, animals were found safe up to a maximum dose of 2000 mg/kg body weight. There were no sign and symptoms of toxicity.

3.2 Antipyretic activity

Pyrexia has started after 1 hr in all three groups. The increased temperature in all animals of Group I (control) confirmed that the temperature is continuously increased up to 4th hr, which was significantly suppressed in standard and test formulation treated groups (Table 1).

Test formulation was significant (P<0.05) at 2nd and 3rd hr and has showed significant (P<0.01) however on 4th hr where temperature increased once again. Finally, it may be concluded that traditionally used formulation has significant (P<0.05) antipyretic activity but with short duration (2-3h). Our experimental data supports the claims of traditional practitioners for formulation as an antipyretic remedy.

Table 1: Rectal temperature of various treated groups at various times intervals

Group ↓	Time					
	0 h	**0.5 h**	**1 h**	**2 h**	**3 h**	**4 h**
Group I (Contol)	102.3± 0.12	102.96± 0.14	103.0 ±0.15	104.2± 0.2	104.63± 0.27	104.73± 0.28
Group II (Standard)	102.16 ±0.06	102.63± 0.12	102.93 ±0.19	103.3± 0.20*	103.3±0 .13**	103.76± 0.16*
Group III (Test)	102.2± 0.05	102.63± 0.12	103.3 ±0.32	102.93± 0.36*	103.33± 0.35**	103.8± 0.34

n=6, * = P<0.05, **=P<0.01

4. CONCLUSION

Pyrexia is the common problem encountered in clinical practice. Pyrexia is the protective mechanism of body which is in the response of the injury, damage and infection to the tissue. To maintain the increased temperature plenty of therapeutic agents are available. The products available in the market to treat pyrexia is paracetamol, which produced several adverse effects such as hepatotoxicity, platelets imbalance etc [8-9]. Traditionally used herbal formulations are a source of new drug and have been used to treat the various disorders. Plenty of plants, *Cassia occidentalis*, *Peperomia pellucida*, *Enicostema littorale* are reported to have antipyretic activity Hence the traditional formulation was taken in our study to evaluate the safety and efficacy by milk induced pyrexia model.

It has shown significant antipyretic activity in rabbit, which supports the claim of traditional practitioners. The possible mechanism of herbal formulation may be due to cyclooxegenase inhibitory effect. Finally it could be concluded that traditionally used formulation in our study may be used in the treatment of increased body temperature as an potent antipyretic formulation.

5. ACKNOWLEDGEMENT

Authors are thankful to Department of AYUSH for financial support to carry out work. Thanks are due to traditional practitioners for sharing their information through Belgaum Integrated Rural Development Society (BIRDS), Naganur, Belgaum, Karnataka, India.

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