

EFFICACY EVALUATION OF HERBAL ANTI- INFLAMMATORY DRUG IN DOGS

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ABSTRACT

To evaluate the efficacy of herbal anti-inflammatory drug against induced acute and chronic inflammation in dogs, 18 healthy mongrel dogs aged 1-2 years were divided equally in to 3 groups (Groups A, B and C). Dogs of group A were kept as control. Acute inflammation in dogs of group B was induced by injecting 0.05 ml of turpentine oil subcutaneously. The herbal medicine was administered @ 1 capsule (containing Prajanya 90 mg, Nishakhya 200 mg, Kilim oil 80 mg, Trikatu 30 mg) per animal orally half an hour before turpentine oil injection. The volume of paw oedema was determined at 1, 2, 3 and 4 hour after turpentine oil injection. Dogs of group C were treated for chronic inflammation which was induced by cotton pellet (50 mg) implant in groin region of all dogs for 12 days. The same herbal drug as given in group B was administered @ 1 capsule twice a day for 12 days. The weight of granulation tissue was calculated after removing the cotton pellets on 13th day. The drug showed high efficacy against chronic inflammation which may be attributed to the chemical ingredient of medicinal plant, Prajanya (*Berberis aristata*), Nishakhya (*Curcuma longa*), Kilim oil (9-octadecenoic acid) and Trikatu (*Piper nigrum*).

Key words: Herbal anti-inflammatory drug, dogs, paw oedema, granulation tissue

Inflammation is the reaction of vascularized living tissue to local injury and consists of many interdependent cellular and humoral events which destroy, dilute or isolate the injurious agent and repair the damage tissues. Herbal anti-inflammatory drug, an indigenous veterinary product, has been indicated for dermatitis, eczema, ringworm, mange, wound, mastitis and other inflammatory conditions (Pal *et al.*, 2002). The ingredients of the herbal veterinary product are Prajanya (*Berberis aristata*), Nishakhya (*Curcuma longa*), Kilim oil (9-octadecenoic acid) and Trikatu (*Piper nigrum*). All the ingredients have been reported to possess anti-inflammatory activity (Chopra *et al.*, 1986). The present study was conducted to evaluate the herbal product as an anti-inflammatory drug in induced acute and chronic inflammations in dogs.

MATERIALS AND METHODS

To evaluate the efficacy of ayurvedic anti-inflammatory drug, 18 healthy mongrel dogs aged 1-2 years were divided equally in to three groups (Groups A, B and C). All the dogs were dewormed by administering one deworming tablet (containing praziquantel 50 mg, pyrantel embonate 144 mg and febantel 150 mg)/10 kg body wt once orally. After seven days of deworming, the experimental dogs were vaccinated against rabies followed by an

acclimatization for 21 days under normal feeding and management conditions by keeping them in cages.

Acute inflammation was induced in dogs of group B. Hind paw was selected for studying the effect of drug for acute inflammation as per the procedure described by Di Rosa *et al.* (1971) in rats with slight modifications. Commercially available turpentine oil (0.05 ml) was injected subcutaneously in the space surrounded by callosities of right hind paw of each dog in this group. The herbal drug was administered @ 1 capsule (containing prajanya 90 mg, Nishakhya 200 mg, Kilim oil 80 mg, Trikatu 30 mg) orally half an hour before turpentine oil injection. The volume of paw oedema was determined at 1, 2, 3 and 4 hour after turpentine oil injection by modified mercuric plethysmometer (Sharma 2002). Percent anti-inflammatory activity of drug was calculated by the method of Gupta *et al.* (1971). Percent anti-inflammatory activity = $(1 - T/C) \times 100$ where, T= mean volume of oedema in the drug treated group; C= mean volume of oedema in the control group.

Chronic inflammation was induced by sterilized cotton pellet (50 mg) aseptically implanted in groin region of dogs of group C under local anesthesia for 12 days. The same drug as given in group B was administered orally @ 1 capsule twice a day for 12 days. The weight of granulation tissue was calculated, after removing the

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Table 1
Anti-inflammatory activity of herbal drug against induced acute inflammation in dogs

Group	Treatment	Oedema volume (ml) Mean \pm S.E.				Per cent increase in anti-inflammatory activity in relation to control group			
		1 st hour	2 nd hour	3 rd hour	4 th hour	1 hour	2 hour	3 hour	4 hour
A	Control	4.51 \pm 1.00	6.24 \pm 1.10	6.66 \pm 1.23	6.79 \pm 1.72	-	-	-	-
B	Herbal anti-inflammatory drug	2.40** \pm 0.03	2.98** \pm 0.10	3.24** \pm 0.18	3.70** \pm 0.04	46.79	52.25	51.36	45.51

Number of animal in each group = 6; ** Statistical significance at $P < 0.01$ in relation to control (CRD)

cotton pellets on the 13th day (under local anaesthesia), by subtracting the original weight of cotton pellet.

The data was statistically analysed by Complete Randomized Design (CRD) as per the method outlined by Snedecor and Cochran (1994). The animal care and experimental protocol were approved by the Institutional Animal Ethics Committee.

RESULTS AND DISCUSSION

Curcuma longa has been extensively used for its anti-inflammatory activity. Curcumin, an alkaloid isolated from *C. longa*, has been reported to produce anti-inflammatory activity (Gupta and Modh 1969). Berberine, an alkaloid isolated from *B. aristata*, has been reported to possess anti-inflammatory activity (Halder *et al.*, 1970). Octadecenoic acid also has an anti-inflammatory activity (Tumen *et al.*, 2011). Piperine (*1-peperoyl piperidine*) isolated from *P. nigrum* also has anti-inflammatory activity in rats (Majumdar *et al.*, 1990).

Administration of herbal anti-inflammatory drug significantly reduced the oedema volume in group B when compared to group A (Table 1). It indicated that the drug was effective in reducing acute inflammation in dogs. Administration of this drug also significantly reduced the weight of granulation tissue in group C when compared to group A (Table 2) indicating that the drug was also effective in reducing chronic inflammation in dogs. When per cent increase in anti-inflammatory

activity of herbal medicine was compared with respect to acute and chronic inflammation, slightly better results of this drug were obtained in chronic inflammation (Tables 1 and 2). In case of acute inflammation, maximum per cent increase in anti-inflammatory activity (52.25) was observed at 2 hr. However, in case of chronic inflammation, percent increase in anti-inflammatory activity of herbal drug was 53.27. The present findings could be because of the chemical ingredient of medicinal plant, *Prajanya* (*B. aristata*), *Nishakhya* (*C. longa*) Kilim oil (*9-octadecenoic acid*) and *Trikatu* (*P. nigrum*) (Sharma, 2002).

REFERENCES

- Chopra, R.N., Nayar, S.L. and Chopra, I.C. (1986). Glossary of Indian Medical Plants. CSIR, New Delhi.
- Di Rosa, D.N., Giroud, J.P. and Willoughby, D.A. (1971). Studies on mediators of the acute inflammatory response induced in rats in different sites by carrageenan and turpentine. *J. Pathol.* **104**: 15-29.
- Gupta, M.B., Bhatt, T.N., Gupta, G.P., Mitra, C.R. and Bhargav, K.P. (1971). Anti-inflammatory activity of toxifolin. *Japanese J. Pharmacol.* **21**: 377-382.
- Gupta, S.S. and Modh, P.R. (1969). Anti-inflammatory effect of *Curcuma longa* in relation to inhibition of histamine release from tissue and meat cells. *Indian J. Pharmacol.* **1**: 89.
- Halder, R.K., Neogi, N.C. and Rathore R.S. (1970). Pharmacological investigation of Berberine hydrochloride. *Indian J. Pharmacol.* **2**: 26.
- Mujumdar, A.M., Dhuley, J.N., Deshmukh, V.K., Raman, P.H. and Naik, S.R. (1990). Anti-inflammatory activity of piperine. *Japanese J. Med. Sci. Bio.* **43**: 95-100.
- Pal, S., Roy, S., Dutta, G.K., Roy, M. and Tiwari, S.K. (2002). Efficacy of dermanol and anbioflam in the treatment of sarcoptic mange in dogs. *J. Vet. Parasitol.* **16**: 187-188.
- Snedecor, G.W. and Cochran, W.G. (1994). Statistical Methods. (8th edn.), The Iowa State College Press, Iowa, USA.
- Sharma, A.B. (2002). Studies on the efficacy of certain non-steroidal anti-inflammatory drugs (NSAIDs) in dogs. M.V.Sc thesis. JNKVV, Jabalpur.
- Tumen, I., Akkol, E.K., Suntar, I. and Keleş, H. (2011). Wound repair and anti-inflammatory potential of essential oils from cones of *Pinaceae*: Preclinical experimental research in animal models. *J. Ethnopharmacol.*, **137**: 1215-1220.

Table 2
Anti-inflammatory activity of herbal drug against induced chronic inflammation in dogs

Treatment (Group)	Weight of granulation tissue (mg) (Mean \pm S.E.)	Per cent increase in anti-inflammatory activity in relation to control group
Control (A)	65.30 \pm 1.04	-
Herbal anti-inflammatory drug (C)	30.52** \pm 0.68	53.27

Number of animal in each group = 6; ** Statistical significance at $P < 0.01$ in relation to control (CRD)