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Research Article

STUDIES ON THE EFFICACY OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS AND SERRATIOPEPTIDASE IN DOGS

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ABSTRACT

Twenty four healthy mongrel dogs of 1-2 years ofage were divided in to four groups (group A-D). Dogs of group B were treated with ibuprofen @ 10 mg/kg b. wt orally, those of group C were treated with nimesulide @ 05 mg/kg b. wt orally and group D with serratiopeptidase @ 02 mg/kg b. wt orally while dogs of group A acted as control. To produce hind paw oedema, 0.05 ml commercially available turpentine oil was injected subcutaneously (s/c) in the space surrounded by callosities of right hind paw of dogs of each group. The drugs were administered orally half an hour before turpentine oil injection. The paw volume was measured by modified mercury plethesmometer before and at 1st, 2nd, 3rd and 4th hour after turpentine injection.All the NSAIDs tested produced a significant reduction in hind paw oedema volume, compared with control group. However, serratiopeptidase produced maximum anti-inflammatory activity followed by ibuprofen then nimesulide.

Key words: Ibuprofen, nimesulide, serratiopeptidase, callosities, modified mercury plethesmometer.

Inflammation is the reaction of vascularized living tissue to local injury and consists of many interdependent cellular and humoral events, which serves to destroy, dilute or isolate the injurious agent and repair the damaged tissues. Many of the non- steroidal anti-inflammatory drugs act on inflammatory conditions including rheumatic arthritis and also possess analgesic and antipyretic activities (Satoskar and Bhandarkar, 1991).

Ibuprofen has analgesic, antipyretic and anti-inflammatory properties (Satoskar and Bhandarkar, 1991). Flubiprofen and nimesulide have been reported to possess marked anti-inflammatory, analgesic and antipyretic activities (Rossi *et al*., 1991). Certain anti-inflammatory enzymes, like serratiopeptidase having very useful therapeutic profile against acute inflammatory condition, but their detail mechanism of action are obscure (Portanova *et al*., 1996). By breaking down abnormal exudates and protein and by promoting the absorption of decomposed products through blood and lymphatic vessels serratiopeptidase improves aggravate circulation in the inflammation (Anon., 2002). In a previous study, we have observed that a herbal medicine containing Prajanya, Nishakhya, Kilim oil and trikatu was highly effective against chronic inflammation in dogs (Misraulia *et al.*, 2012).

MATERIALS AND METHODS

Experimental Design: To evaluate the efficacy of anti-inflammatory drugs, 24 healthy mongrel dogs of 1-2 years of age were divided in to four groups (Groups A-D). Group A was kept as control group, group B was treated with ibuprofen @ 10 mg/kg b. wt orally, group C with nimesulide @ 5 mg/kg b. wt orally and group D with serratiopeptidase @ 2 mg/kg b. wt orally. The study has been conducted at College of Veterinary Science and A.H., Mhow (M.P.). All the dogs were dewormed by administering praziquantel 50 mg, pyrantel embonate 144 mg and febantel 150 mg containing deworming tab/ 10 kg body weight. After seven days of deworming, the experimental dogs were vaccinated against rabies. An acclimatization period of 21 days was allowed, following anti-rabies vaccine, under normal feeding and management conditions by keeping them in cages prior to starting the experimental work. The animals were fasted overnight but water was given *ad lib* before starting the experiment.

Anti-Inflammatory Activity: Dog hind paw was selected for studying the effect of drugs against 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 (s/c) in the space surrounded by callosities of right hind paw of each dog of all groups. All drugs were administered orally half an hour before turpentine oil injection. The volume of paw oedema was determined at 1st, 2nd, 3rd and 4th hour after turpentine oil injection by modified mercuric

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Table 1
Anti-inflammatory activity of anti-inflammatory drug against induced acute inflammation

Group no.	Treatment	Oedema volume (ml; Mean±S.E.)				Per cent increase in anti-inflammatory activity			
		1st hour	2nd hour	3rd hour	4th hour	1st hour	2nd hour	3rd hour	4th hour
A	Control	4.51±1.00	6.24±1.10	6.66±1.23	6.79±1.72	-	-	-	-
B	Nimesulide	2.16**±0.25	2.96**±0.28	2.30**±0.06	2.97**±0.07	46.79	52.25	51.36	45.51
C	Ibuprofen	1.97±0.21	2.08±0.27	2.37±0.30	2.39±0.28	-	-	-	-
D	Serratiopeptidase	1.80**±0.04	2.47**±0.18	2.64**±0.17	2.76**±0.14	46.79	52.25	51.36	45.51

Number of animal in each group = 6 ** Statistical significance within a column at P< 0.01 in relation to control

plethesmometer (Sharma, 2002). Percent anti-inflammatory activity of the drug was calculated by the method of Di- Rosa *et al*. (1971).

Per cent anti-inflammatory activity = (1- T/C)×100

Where, T= mean volume of edema in the drug treated group; C= mean volume of edema in the control group.

RESULTS AND DISCUSSION

The result of the anti-inflammatory activity of the drug against acute inflammation (Table 1) revealed a significant reduction in the paw oedema volume in all treatment groups. In all the treated groups, reduction in the paw oedema volume was observed starting from one hour post treatment. Serratiopeptidase led to maximum reduction in paw oedema volume followed by ibuprofen and nimesulide in decreasing order.

The potent activity of serratiopeptidase may be attributed to its proteolytic and mucolytic actions on the abnormal inflammatory exudate and also to accentuated absorption of decomposed products through blood and lymphatic vessels (Anon., 2002). However, its action on other inflammatory mediators can not be ruled out and it needs further investigation.

The remaining NSAIDs viz. ibuprofen and nimesulide revealed more or less similar efficacy in the acute inflammation. The findings of these NSAIDs are in agreement with the reports of Harada *et al.* (1998) and Sharma (2002).

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