COMPARATIVE THERAPEUTIC STUDIES IN CANINE DEMODICOSIS

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Abstract

A treatment study was conducted on 24 natural cases of canine demodicosis with four treatment groups 1) ivermectin-200µg/kg/sc fortnightly, 2) amitraz 0.05% topically weekly, 3) combination of ivermectin and amitraz at same dose rate 4) combination ivermectin and amitraz both at same dose rate and levamisole 2.5mg/kg s/c weekly. Therapeutic efficiency based on clinical response to treatment, clearance percentage of mites and per cent clinical improvement based on demodicosis index showed amitraz to be highly effective in clearing the infection. Combination of amitraz with ivermectin and levamisole was found to have a faster response in severe generalized cases of the disease.

Keywords: *Demodicosis, Ivermectin, Amitraz, Levamisole, Demodicosis index.*

Canine demodicosis represents one of the most perplexing treatment problem to the canine practitioners. Generalized demodicosis is one of the severe skin diseases which can often be fatal. Both topical medicaments from ronnel to amitraz and systemic endectocides from ivermectin to milbemycin oxime are used for the treatment of demodicosis. Since immunodeficiency is indicated in the pathogenesis of demodicosis, immunostimulants like levamisole is found to be useful (Bhosale *et al.*, 2000). Present study compares the efficacy of treatment of canine demodicosis with ivermectin and amitraz singly and their combination with and without levamisole.

Materials and Methods

Twenty four positive cases of canine demodicosis presented at University Veterinary Hospitals, Mannuthy and Kokkalai were divided randomly into four, each comprising of a minimum of six cases. First group was given ivermectin at 200 µg/kg S/C fortnightly, second group with ivermectin at same dose rate and amitraz 0.05 per cent topically weekly. Third group was treated with a combination of ivermectin and amitraz, at the same dose rate and schedule and fourth group with ivermectin, amitraz and levamisole at 2.5 mg/kg s/c weekly. Treatment trials were undertaken for a period of minimum eight weeks irrespective of the prognosis or until the skin scrapings were negative. Efficacy of the treatment trials were assessed based on clinical response to treatment, examination of skin scrapings

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for the presence of mites at weekly intervals and determination of demodicosis index. Two consecutive negative results were considered as the indication of a successful treatment. Determination of demodicosis index was done as per Folz *et al.*, 1978. The entire body surface of the dog was divided into four quarters. The percentage of each quarter with gross clinical manifestation was recorded. The portion of each quarter was examined for characteristic lesions of demodicosis and were scored as Many lesions – 4, Moderate lesions – 3, Few lesions – 2 and No lesions – 1. From per cent involvements, mean per cent involvement and from the lesion scores, mean lesion score was calculated. Then the pre and post treatment indices were calculated by multiplying mean per cent involvement and mean lesion score.

$$\text{Per cent clinical improvement} = \frac{\text{Mean pre treatment index} - \text{Mean post treatment index}}{\text{Mean pre treatment index}} \times 100$$

Results and Discussion

Assessment of therapeutic efficacy in terms of examination of skin scrapings and mean per cent improvement is summarized in Table 1 and Table 2. In ivermectin treated group, all the localized cases cleared mites after four treatments (eight weeks) while 33.33 per cent of generalized cases retained mite population even after five treatments (10 weeks). The mean per cent improvement was –132.5 ± 469.80 after seven weeks. This negative mean percent improvement shown in the ivermectin treated group was due to the worsening of the generalised form of demodicosis treated with ivermectin alone. In other three groups, cent per cent of the cases cleared mites after 10 weeks of treatment, but a comparative faster healing rate though not statistically significant was observed in the group treated with ivermectin, amitraz and levamisole both in terms of clearance percentage of mites from the skin as well as per cent improvement.

Ivermectin was found to be effective in only those cases with localized lesions in agreement with Chhabra *et al.* (2001), while Sarma *et al.* (1992) reported recovery in all cases of generalized and localized demodicosis. A higher per cent improvement of 96.13 ± 6.393 by six treatments was noted in the present study in amitraz treated group in comparison with Folz *et al.* (1984) who got a per cent improvement of 92.1 by 3-6 treatments. The higher efficacy in the present study may be due to higher concentration of the drug used and increased frequency of application adopted. The combination of ivermectin and amitraz cured cent per cent of the dogs by 10 treatments while Soni *et al.* (1999) reported cent per cent recovery by seven weeks with ivermectin 200 mcg/kg and amitraz 0.03 per cent weekly. The lower efficacy in the present study may be due to variation in the severity of the lesions and pedal involvement of the cases which delayed treatment response. Bhosale *et al.* (2000) observed 66.67 per cent of cure rate in 40 days with a combination of amitraz (0.03 per cent) and levamisole 2.5 mg/kg weekly while 83.33 per cent cure rate was observed in the present study with ivermectin, amitraz and levamisole which may be due to high concentration of amitraz as well as antiparasitic and immunostimulatory action of ivermectin (Blakley and Rosseux, 1991 and Charach, 1995). The per cent improvement in the treatment groups other than ivermectin showed no significant difference indicating that the three of them were equally effective. But higher per cent improvement and faster clearance of mites observed in the group treated with the combination of three drugs might be due the immunostimulatory and antiparasitic effect of ivermectin and ability of levamisole to stimulate cell mediated immunity by potentiating the rate of T-lymphocyte differentiation (Roberson, 1982) as defect in cell mediated immunity and blastogenesis of T-lymphocyte (Muller *et al.,* 1989) was observed in demodicosis.

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Table1. Clearance percentage of mites from lesions

	0 week	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week	9th week	10th week
No. of dogs positive	6	6	6	6	6	6	4	3	2	2	2
No. of dogs negative	0	0	0	0	0	0	2	3	4	4	4
per cent negative	(0)	(0)	(0)	(0)	(0)	(0)	(33.33)	(50)	(66.67)	(66.67)	(66.67)
A											
No. of dogs positive	6	6	6	6	6	6	3	3	2	0	0
No. of dogs negative	0	0	0	0	0	0	3	3	4	6	6
per cent negative	(0)	(0)	(0)	(0)	(0)	(0)	(50)	(50)	(66.67)	(100)	(100)
I+A											
No. of dogs positive	6	6	6	6	6	5	4	2	1	1	0
No. of dogs negative	0	0	0	0	0	1	2	4	5	5	6
per cent negative	(0)	(0)	(0)	(0)	(0)	(16.67)	(33.33)	(66.67)	(83.33)	(83.33)	(100)
I+A+L											
No. of dogs positive	6	6	6	6	5	5	4	1	1	1	0
No. of dogs negative	0	0	0	0	1	1	2	5	5	5	6
per cent negative	(0)	(0)	(0)	(0)	(16.67)	(16.67)	(33.33)	(83.33)	(83.33)	(83.33)	(100)

I – Ivermectin, A – Amitraz, L – Levamisole Figures in parenthesis indicate per cent

Table 2. Effect of treatments on canine demodicosis in terms of per cent improvement

Treatment group	No.of dogs	Drugs used	Weekly clinical improvement (per c ent) (Mean + SD)						
			1st	2nd	3rd	4th	5th	6th	7th
I	6	Ivermectin	-48.33 ± 163.51	-55.12 ± 218.68	-155.54 ± 505.56	-147.52 ± 506.77	-144.39 ± 508.38	-135.63 ± 513.00	-132.5 ± 469.80
II	6	Amitraz	24.13 ± 17.73	35.93 ± 15.42	65.23 ± 20.35	80.07 ± 16.32	85.08 ± 17.89	96.13 ± 6.39	97.98 ± 2.54
III	6	Ivermectin + Amitraz	20.27 ± 11.51	40.79 ± 14.78	57.35 ± 17.05	76.39 ± 25.40	88.29 ± 19.03	93.52 ± 12.21	96.94 ± 6.12
IV	6	Ivermectin + Amitraz + Levamisole	30.12 ± 16.49	60.38 ± 27.69	72.57 ± 24.69	83.79 ± 19.48	93.86 ± 6.01	97.72 ± 3.29	99.84 ± 0.35

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