

Comparative efficacy of doramectin and ivermectin in rabbit mange

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Abstract

The comparative efficacy of drug doramectin and ivermectin was evaluated against *Notoedrus cati var cuniculi* in rabbits. For this, 18 rabbits severely infected with *N. cati* were divided into three groups (six animals in each group). Group 1 and Group 2 were treated with doramectin and ivermectin @ 400 µgkg⁻¹ of body weight subcutaneously, respectively, while Group 3 was kept as infected control and injected normal saline (Placebo). The rate of cure was assessed on the basis of decrease in mite count in skin scrapings and clinical improvement. Complete absence of mites was observed between 9-12 days in doramectin and 15 days in ivermectin treatment group. The rabbits of doramectin treated group showed complete recovery with new hair growth by day 21 of application while ivermectin treated animal showed the same by day 30. The animals in infected group continued to show depreciation in their body condition and two heavily infested rabbits died.

Keywords: Rabbit, Doramectin, Ivermectin, *Notoedrus cati*.

Introduction

The mange *Notoedrus cati var cuniculi* is a borrowing mite commonly associated with skin problems in rabbits. The disease is very common in subtropical countries like India especially during rainy and winter season due to low temperature and high humidity (Kumar, 1998). Many drugs have been tried for chemotherapy of these mites. Ivermectin (since inception) has been drug of choice against parasitic nematodes and arthropods due to its high efficacy, easy applicability and wide range of safety margin. Recently introduced doramectin (Dectomax, Pfizer India Ltd.), a genetically engineered compound of ivermectin is reported to have wide spectrum of action (Goudie *et al.*, 1993). The drug has been tried in dogs against sarcoptic mange (Jagannath and Yathiraj, 1999), cattle against sarcoptic mange (Gupta, 2002) and rabbits against *N. cati* (Singari *et al.*, 2001). But there are few reports comparing efficacy doramectin with parent compound ivermectin. As such no work on comparative efficacy of both drugs involving mite counts/sq.cm. percentage reduction and morphological improvement have been reported. Hence, the present study was carried out.

Materials and Methods

Eighteen rabbits naturally infested with mange mites were selected from Punjab Veterinary Vaccine Institute, Ludhiana for the present study. The mites were identified as described by Greiner (1994). The affected animals were divided randomly into three groups of 6 animals each. All the rabbits were kept in separate cages so that no cross transmission may occur. Group 1 animals were treated with doramectin and Group 2 with ivermectin, both @ 400 µgkg⁻¹ b.w. subcutaneously. While Group 3 animals were kept as infected control and injected with normal saline solution (Placebo). The skin scrapings were collected from 1 cm² area of the most affected part in 10% KOH and warmed. The mites were counted in the scrapings on day 0 (before treatment), 3, 6, 9, 12, 15, 21, 30 day and efficacy was judged on the basis of reduction in mite count, post treatment. The results presented are as mean ± S.E. Percentage efficacy of the individual drug was calculated using the formula:

$$\text{Percentage reduction} = \frac{a - b}{a} \times 100$$

Where a = mite count on day 0 (before treatment)

b = mite count of the same treatment group on day 3, 6, 9, 12, 15, 21 and 30

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Simultaneously, the clinical lesions were observed for the improvement in general body condition.

Results and Discussion

The mite infecting rabbits was identified as *N. cati* var. *cuniculi*. The decrease in mite count and percentage reduction are presented in Table 1. As depicted in Table 1, the mite count decreased in both, Group 1 and 2 but in Group 3, it increased throughout the period of study. It is pertinent to point out that in Group 1, the reduction in number of mites was faster when compared to Group 2. It was observed that by day 3 the reduction in Group 1 was better than Group 2 by more than 6% while on day 9, the difference of about 4% was observed. The faster reduction in mite count in doramectin treatment group showed a higher bio-availability of doramectin over ivermectin at the same dose rate (Toutain *et al.*, 1999). The improvement in clinical symptoms was also better in the same group. Here it may also be appreciated that in Group 1, on day 9, the mites were absent from 3 rabbits while the remaining showed small crusts on ears indicating that the blood concentration was minimum in ears (Mckellar *et al.*, 1992). Similarly, in Group 1, the same condition was observed on day 12 post-treatment. It was also observed that the mite count was zero in all the animals in Group 1 on day 12 post-treatment, however, in Group 2, on day 12 none of the animals were devoid of mites.

As far as the improvement in lesion is concerned, Group 1 showed complete shedding of crusts and new hair growth on day 12 while in Group 2 it was observed on day 15 post-treatment. In Group 1, hair growth was almost complete by day 21 and by day 30 it was almost normal whereas in Group 2, hair growth was almost complete by day 30 only. Throughout the period of study of 30 days, animals of both treatment groups remained free of mite with

normal hair growth. In group 3, the mite count continued to increase and two animals died after showing the sign of the severe irritation and itching (day 9 and 15). From these results, it is apparent that doramectin is having better efficacy as compared to ivermectin at same dose rate and route. The possible cause is that plasma concentration of doramectin is higher as compared to ivermectin (Gayrard *et al.*, 1992; Toutain *et al.*, 1999).

The present findings are quite similar to that of Singari *et al.* (2001) who reported zero mite count on day 10 with doramectin given @ 400 $\mu\text{g kg}^{-1}$ b.w. Singla *et al.* (1996) and Singh and Gill (1989) also reported complete absence of mites on day 7 in rabbits on treatment with ivermectin @ 400 $\mu\text{g kg}^{-1}$ b.w. given subcutaneously. The possible reason of this difference is the intensity or duration of infection in those animals. It is also a possibility that the drug ivermectin showed reduced activity against these parasites due to its extensive use for treatment of ectoparasites.

Acknowledgement

The authors are thankful to Punjab Veterinary Vaccine institute, Ludhiana for providing the animals for the present study. The authors are also thankful to Pfizer India Limited for providing the required miticide for the present study.

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Table 1: Mite count upto 30 days post-treatment

Group		Days							
		0	3	6	9	12	15	21	30
1	Mite count	225.16 ± 26.34	59.66 ± 7.37	20.16 ± 1.95	3.32 ± 1.10	0.00	0.00	0.00	0.00
	% reduction	NA	73.10	90.01	98.53	100	100	100	100
2	Mite count	222.16 ± 23.70	89.33 ± 8.32	38.16 ± 2.44	17.93 ± 1.84	5.87 ± 1.17	0.00	0.00	0.00
	% reduction	NA	66.98	86.60	94.00	98.29	100	100	100
3	Mite count	226.00 ± 13.27	233.50 ± 11.24	250.17 ± 11.98	258.80 ± 8.08	274.00 ± 10.11	274.75 ± 5.14	280.00 ± 5.49	288.25 ± 4.49

The values given are mean \pm S.E. of 6 animals.

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