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Ayşen GARGILI

Erkut TÜZER

Aynur GÜLANBER

İlker EFIL

Vedat KELEŞ

See next page for additional authors

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Efficacy of Moxidectin Against *Aspiculuris tetraptera* and *Syphacia muris* in Naturally Infected Rats

Ayşen GARGILI, Erkut TÜZER, Aynur GÜLANBER, İlker EFİL, Vedat KELEŞ, Meltem ULUTAŞ, Müfit TOPARLAK

İstanbul Üniversitesi Veteriner Fak., Parazitoloji ABD., 34851 Avcılar, İstanbul-TURKEY

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Abstract: In this study, 56 rats *(Rattus norvegicus)* naturally infected with both *Aspiculuris tetraptera* and *Syphacia muris* were used. The animals were randomly divided into the treatment (37 animals) and control (19 animals) groups. Moxidectin (Cydectin enj., %1 Moxidectin) at 0.2 mg/kgbw was given subcutaneously to the treatment group. The faeces of both groups were examined on days 0, 7, 14, 21, 28. The post-mortem examination of one animal from each group was performed to confirm the EPG results on days mentioned above. The percentage efficacy was measured on the basis of the reduction of the eggs.

The eggs and adults of both parasites were seen in the control and treatment groups on day 0 and in control group on all posttreatment days. In the treatment group on all post treatment days, the eggs and adults of *S. muris* were encountered but no developing stages of *A. tetraptera.*

The results indicated that Moxidectin at 0.2 mg/kgbw was 100 % effective against *A. tetraptera* but ineffective against *S. muris.*

Key Words: *Aspiculuris tetraptera, Syphacia muris,* Rat, Moxidectin, Treatment.

Moxidectin'in Doğal Enfekte Ratlardaki *Aspiculuris tetraptera* ve *Syphacia muris*'e Etkisi

Özet: Bu çalışmada 0.2 mg/kg dozda derialtı yolla uygulanan Moxidectin (Cydectin enj., 1 % Moxidectin)'in ratların (*Rattus norvegicus*) sindirim kanalı nematodlarından *Aspiculuris tetraptera* ve *Syphacia muris* üzerine etkisi denenmiştir. İlacın *A. tetraptera*'ya % 100 etkili, *S. muris*'e ise etkisiz olduğu görülmüştür.

Anahtar Sözcükler: *Aspiculuris tetraptera, Syphacia muris,* Rat, Moxidectin, Tedavi

Introduction

The species of *Aspiculuris* and *Syphacia* occur widespread in laboratory rat colonies (1). The effects of various drugs have been tested against *Aspiculuris tetraptera, Syphacia muris* and *S. obvelata* (2, 3, 4, 5), but no study on Moxidectin was encountered.

In this study, the efficacy of Moxidectin (0.2 mg/kgbw, sc) against *A. tetraptera* and *S. muris* in rats was evaluated.

Materials and Methods

In this study 56 rats aged 3 months and naturally infected with *A. tetraptera* and *S. muris* were used. The existence of parasites was determined by the morphological peculiarities of the eggs in faeces (6, 7, 8, 9). Rats were divided randomly into the treatment (20 female, 17 male) and control (10 female, 9 male) groups. The EPG values were calculated from mixed faeces of animals in each group. Moxidectin (Cydectin enj.) at a dose of 0.2 mg/kgbw was given to the rats in the treatment group subcutaneously. On days 0, 7, 14, 21 and 28, the EPGs of groups were determined and one animal from each group was sacrified to confirm the EPG results. Parasites collected from sacrified animals were identified according to the literature (6, 7, 9). EPG values were calculated as follows.

EPG = (Sxn)/(sxm)

S : Surface area of flotation container

n : Numbers of eggs counted under 2 lamels (18x18)

s : Surface area of 2 lamels (18x18)

m : Amount of faeces (g)

The percentage efficacy of the drug was evaluated according to the following equation derived from Abbott's Formula.

Efficacy (%) = 100 x [1-(EPG_{TA}/EPG_{CA}) x (EPG_{CB}/EPG_{TB})]

($_c$) Control, ($_T$) Treatment groups; ($_B$) Before, ($_A$) After treatment

Results

No adverse effect was seen in the treatment group. Other results are given in Table.

		Syphacia muris					Aspiculuris tetraptera				
Day	Sex	PM[1]	PM[2]	EPG[1]	EPG[2]	(%)	PM[1]	PM[2]	EPG[1]	EPG[2]	(%)
	Male	+	+	18	20		+	+	48	14	
Day 0	Femela	+	+	16	22		+	+	21	18	
	Average			17	21				34.5	16	
	Male	+	+	11	4	67	+	-	32	0	100
Day 7	Female	+	+	16	0	100	+	-	20	0	100
	Average			13.5	2	88			26	0	100
	Male	+	+	14	15	3.6	+	-	38	0	100
Day 14	Female	+	+	17	4	83	+	-	12	0	100
	Average			15.5	9.5	50			25	0	100
	Male	+	+	19	17	19	+	-	25	0	100
Day 21	Female	+	+	30	21	49	+	-	19	0	100
	Average			24.5	19	37			22	0	100
	Male	+	+	9	14	0	+	-	42	0	100
Day 28	Female	+	+	16	20	9.1	+	-	22	0	100
	Average			12.5	17	0			32	0	100

[1]Control and [2]Treatment groups

Table 1. The number of eggs per gram (EPG), existence of the parasites in necropsy (PM) and drug efficacy (%).

Discussion

For the treatment of *Syphacia* and *Aspiculuris* species in mice and rats albendazole, mebendazole, fenbendazole (3), thiabendazole (4), ivermectin (2, 5) were used.

Oral administrations of albendazole, mebendazole and fenbendazole were found to be effective against *S. muris* and *A. tetraptera* in rats (3), thiabendazole (in food) against to *S. obvelata* in rats and mice (4), ivermectin (spraying) against to *A. tetraptera* and *S. obvelata* in mice (2) and ivermectin (in drinking water) against to *A. tetraptera* but not *S. obvelata* in rats (5).

In this study, Moxidectin used at a dose of 0.2 mg/kg given subcutaneously was found 100 % effective against *A. tetraptera* but not *S. muris.* These findings are similar to those obtained from the study (5) on Ivermectin.

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