

Efficacy of Moxidectin Against *Toxocara Canis* In Experimentally Infected Dogs

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Abstract: In this study, 6 six-week-old puppies born of a stray bitch were used. Four of them were 5 kg, one of them 7 kg and the last 8 kg. Before egg inoculation, fecal examination by flotation technique showed that the animals had no helminth infection. Each puppy was infected orally with 150 embryonated *Toxocara canis* eggs. When the egg first seen in their faeces after inoculation, Moxidectin (Cyctectin 1% inj) at a dose of 0.2 mg/kgbw was given subcutaneously. Fecal examinations were performed by flotation technique, on day-0 (treatment day), day-7, day-14 and day-21, and EPG values were calculated on the same days. Three dogs which had died of a viral infection at the 15 th day of the experiment were necropsied and their intestines were examined for the adult stage of *T. canis*

On fecal examination, no egg was found on posttreatment days (on days 7, 14, 21) and no adult parasite was seen at necropsy. Based on these findings, Moxidectin was found 100% effective against the adult stage of *Toxocara canis*.

Between 4th and 12th hours after treatment, temporary side effects such as edematous swellings on face and pruritic erythematous dermatitis on the abdominal and inguinal regions were seen in four animals. It was noticed that the animals showed side effect were 2-3 kg less than others.

Key Words: Moxidectin, *Toxocara canis*, dog, treatment.

Moxidectin'in Deneysel Enfekte Köpeklerde *Toxocara Canis*'e Etkisi

Özet: Bu çalışmada bir sokak köpeğinden doğan 5-8 kg, ağırlığında 6 haftalık 6 yavru kullanıldı. Flotasyon yöntemi ile yapılan dışkı yoklamasında hayvanların herhangi bir helmintle enfekte olmadığı belirlendi. Yavruların herbirine içinde canlı larva bulunan 150'şer *Toxocara canis* yumurtası ağız yoluyla verildi. Dışkılarında yumurta görülmesinden bir hafta sonra hayvanlara 0.2 mg/kg dozda Moxidectin (Cydectin %1 enj.) derialtı yolla uygulandı. İlaç uygulaması günü ve ilaç uygulamasını izleyen 7., 14. ve 21. günlerde flotasyonla dışkılar incelendi ve EPG'ler (gram dışkıdaki yumurta sayısı) belirlendi. Çalışmanın 15. gününde başka bir hastalıktan ölen üç köpeğe nekropsi yapılarak bağırsaklarında erişkin nematodlar arandı.

Tedavi sonrası yapılan dışkı yoklamalarında yumurtaya rastlanmaması ve ölen hayvanların nekropsilerinde erişkin parazitlen görülmemesine dayanılarak Moxidectin'in köpeklerde *T. canis*'in erişkinlerine etkisi %100 olarak bulundu.

İlaç uygulamasını izleyen 4. ve 12. saatler arasında 4 köpekte geçici olarak dermatit ve yüzde ödem oluşması gibi yan etkiler görüldü. Yan etki görülen hayvanların vücut ağırlıklarının diğerlerinden 2-3 kg daha az olduğu dikkati çekti.

Anahtar Sözcükler: Moxidectin, *Toxocara canis*, köpek, tedavi.

Introduction

Toxocara canis is a widespread nematode in dogs. Especially, newborn puppies born of infected bitch may die of larval migration in lungs (1-2). Infective larvae of this nematode responsible for visceral larva migrans in various animals and man (3-4). Various chemicals (5-10) have been tested for the treatment of *T. canis* in dogs. In this study, efficacy of Moxidectin was evaluated against the adult stage of *T. canis*.

Materials and Methods

In this study, 5 female and 1 male, 6 week old dogs weighing 5-8 kg were used. They were born of a stray

bitch and exhibited no breed characteristic. In the beginning of the experiment, faecal examinations were performed by flotation technique and no helminth egg was found.

Approximately 150 embryonated *T. canis* eggs were given to each dog orally. When the egg first seen in their faeces after inoculation, moxidectin (Cydectin 1% inj) at a dose of 0.2 mg/kgbw was given subcutaneously. Fecal examinations were performed by flotation technique, on day-0 (treatment day), day-7, day-14 and day-21, and EPG values were calculated on the same days. Three dogs which had died of a viral infection at 15th day of the experiment were necropsied and their intestine were examined for adult stage of *T. canis*. EPG values were

calculated by flotation technique according to the following equation.

$$EPG = (S \times n) / (s \times m).$$

S: Surface area of flotation container.

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

s: Surface area of 2 lamels (18x18).

m: Amount of faeces (g).

The evaluation of drug efficacy was based on the EPG values before and after treatment, and the findings at necropsy.

The dogs were observed one hour intervals after the treatment for adverse reactions until disappeared if developed.

Results

Parasitological findings and the efficacy of moxidectin were given in Table. After treatment, between 4th and 12th hours, a pruritic erythematous dermatitis was observed on the abdominal and inguinal regions of two dogs weighing 5 kg while other two dogs weighing 5 kg had edematous swellings on face. No adverse reaction was seen in the rest of the dogs, weighing 7 and 8 kg.

Discussion

In the last decade, pyrantel pamoate, nitroscanate (9), milbemycin (5,10), ivermectin (8), and a combination of praziquantel, pyrantel embonate and febantel (6-7) were tested for the treatment of *T. canis* in dogs.

Pyrantel pamoate at a dose of 5 mg pyrantel base/kgbw have been tested on 64 dogs (9). On fecal examination, 60 dogs have been found to be negative for *T. canis* eggs after treatment, in 3 dogs decreased egg

count have been detected while in 1 dog the egg count has not been altered. Similar results were obtained from nitroscanate in the same study (9).

In a study (10) in which milbemycin oxime was used at a dose of 0.25 mg/kg orally, it was reported that in 12 out of 18 dogs EPG became negative by 30 days post treatment when no adult worm was recovered and in 4 dogs EPG became negative by 7 days post treatment although they harboured mature or immature worms in the intestine at 30 days after treatment. In the rest 2 dogs, although eggs in the faeces disappeared after 7 days, a few eggs were detected in faeces at 30 days post treatment. According to the findings mentioned above, the efficacy of pyrantel pamoate, nitroscanate (9) and milbemycin oxime (10) were incomplete.

In another study (5), milbemycin was found to be 100 % effective at 0.27 mg/kgbw by oral route. As seen above, results of the studies (5,10) about the efficacy of milbemycin were controversial.

Ivermectin was reported to be 100% effective at a dose of 0.2 mg/kg. subcutaneously (8).

Efficacy of the combination of praziquantel, pyrantel embonate and febantel was determined to be 97.9 % (7) and 98.4% (6) with one application and 100 % (7) with two applications.

In our study, efficacy of moxidectin at a dose of 0.2 mg/kg. subcutaneously was found to be 100 % against adults of *T. canis* in dogs based on EPG and necropsy findings.

Temporary adverse reactions such as pruritic and erythematous dermatitis on the abdominal and inguinal regions and edematous swellings on face were seen in four animals between 4th and 12th hours after treatment in this study. It was noticed that these animals were 2-3 kg lesser than others in body weight.

No of dog	A	S	W	Day-0	Day-7	Day-14	Day-21	N
1	6	F	5	270	0	0	Died	0
2	6	F	5	230	0	0	Died	0
3	6	F	8	300	0	0	0	-
4	6	F	7	330	0	0	0	-
5	6	F	5	530	0	0	0	-
6	6	M	5	300	0	0	Died	0
Mean				327	0	0	0	0
Efficacy(%)				-	100	100	100	100

Table 1. Age¹ (A), Sex (S), Weight² (W) of dogs, EPG values in different days (Day 0, 7, 14, 21), the number of adult parasites recovered from dogs died on day-15 (N) and drug efficacy (%).

¹in week, ² in kg.

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