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IMPORTANCE OF APPLICATION OF SOME ENVIRONMENTAL MEASURES AFTER DEWORMING OF STRAY DOGS INFECTED WITH SOME HELMINTH PARASITES

(With One Table)

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أهمية تطبيق بعض الاشتراطات البيئية بعد علاج الكلاب الضالة المصابة ببعض الديدان المتطفلة

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تبين من هذه الدراسة أن علاج الكلاب الضالة والتي تم حبسها بغرض تجهيزها لإحدا ث عدوى تجريبية ليس كافيا للتخلص من الطفيليات الموجودة بها. وتعزى هذه الظاهرة إلى كل من كفاءة العقار المستخدم بالإضافة إلى التطهير الكامل لأماكن حبس هذه الكلاب ضد الأطوار المعدية لكل الطفيليات الموجودة. وفي هذه الدراسة تم علاج مجموعتين حبيستين من الكلاب باستخدام عقاري البرازيكونتيل (قرص/ 5-7 كجم من وزن الجسم) والفيبندازول (50 مجم/كجم من وزن الجسم) مما نتج عنه التخلص الكامل من كل البويضات والقطع الحاملة لكل من دودة التينيا ودودة الكلب الشريطية كما أدى استخدام عقار الفيبندازول إلى التخلص من كل من دودة الكلب الخطافية ودودة اسكارس الكلاب وذلك بعد أسبوعين من استخدام العقار. وقد بينت إعادة فحص نفس الكلاب بعد ستة أسابيع من العلاج ظهور بويضات اسكارس الكلاب ودودة الكلب الخطافية ودودة التينيا ودودة الكلب الشريطية بنسب 9.09، 3.03، 6.06 ، 6.06 % على الترتيب وذلك في الحيوانات التي تزيد أعمارها عن عام واحد، في حين كانت نسب الإصابة 16.67، صفر، 8.33، 8.33 % على الترتيب في الحيوانات التي تقل أعمارها عن عام مما يعنى حدوث تكرار للعدوى بسبب وجود العوائل الوسيطة لبعض الديدان مثل دودة الكلب الشريطية أو وجود الأطوار المعدية لبعض الديدان في الوسط المحيط بالكلاب أو حتى وجود بعض اليرقات النشطة والتي لم يؤثر العقار عليها كما في بعض الديدان مثل دودة الكلب الخطافية ودودة اسكارس الكلاب. وهذا يشير إلى أن تلوث صناديق تربية الكلاب والوسط المحيط بها يلعب دورا هاما في حدوث العدوى مرة أخرى بالطفيليات الموجودة وخاصة تلك التي تعتمد منها على وجود الحشرات كعائل وسيط أو حتى التي لا تحتاج إلى عوائل وسيطة. ونستخلص من هذه الدراسة أهمية تطبيق الأشتراطات الصحية علي أماكن

تربية هذه الحيوانات وكذلك البيئة المحيطة بها مع محاولة منع وصول أي حيوانات أخري ضالة أو قوارض إلي هذه الأماكن.

SUMMARY

The present study showed that treatment of stray dogs in captivity in order to prepare them for further experimental infection is not enough for elimination of parasites previously recorded in them. This phenomenon is not only related to the efficacy of the drugs used, but also for complete disinfection of places of captivity against infective stages of all included parasites. This study clears that after treatment of 2 groups of stray dogs captive in separate boxes by using Praziquantil (1 Tablet/5-7kg B.W) and Fenbendazole (50 mg/kg B.W) revealed complete disappearance of *Taenia* sp. and *Dipylidium caninum* (*D. caninum*) eggs and their gravid segments. Fenbendazole led to disappearance of previously diagnosed *Ancylostoma caninum* (*A. caninum*) and *Toxocara canis* (*T. canis*) eggs at 2 weeks post treatment. Re-examination of captive dogs in floor pin 6 weeks post treatment revealed presence of *T. canis*, *A. caninum*, *Taenia* sp. and *D. caninum* eggs by percentages of 9.09, 3.03, 6.06 and 6.06 % respectively in animals more than one year; while those less than one year showed incidence of *T. canis*, *Taenia* sp. and *D. caninum* with percentages of 16.67, 8.33 and 8.33 % respectively. On the other hand, re-examination of captive dogs in metal battery 6 weeks post treatment proved that there was no infection among them. This means that re-infection took place as a result of the presence of intermediate host of *D. caninum*, while reappearance of *A. caninum* and *T. canis* may be related to the presence of infective stages contaminating the media surrounding the treated dogs or presence of some migrating larvae that succeeded to escape from the applied treatment. This clears that the previous contamination in these boxes and their surroundings plays an important role in the re-infection of these animals by some parasites especially those depending on arthropod-intermediate hosts or those did not need intermediate hosts. In conclusion, this study denotes the importance of application of restricted measures to these boxes and their surrounding places together with prevention of arrival of other stray animals as well as rodents to these habitats.

Key words: *Helminth parasites, Toxocara, Dipylidium, Anclystoma, Taenia, dog.*

INTRODUCTION

Gastrointestinal parasites are among the most common pathogenic agents encountered by veterinarians dedicated to companion animals and they constitute one of the main causes of pathological lesions in alimentary tract of dogs (Ramirez-Barrios *et al.*, 2004).

Control of these parasites is usually based on using of anthelmintic prophylaxis, so, to obtain a regular deworming, periodic examination of fecal samples and treatment of the infected dogs must be involved (Emde, 1993 and Pullola *et al.*, 2006).

The care of animals has always included the management of internal parasites. As technology has progressed, the medications developed have become more and more broad in the spectrum of parasites they can eradicate. Several researches applied on dogs depending on collection of small numbers of stray dogs of different ages in small boxes and treatment of their natural infection before starting the original experimental trials especially those of parasitic studies. Several number of helminthes are common in dogs required arthropods intermediate hosts including *Dipylidium caninum* (Wang *et al.*, 2006), also others as *Toxocara canis* and *Ancylostoma caninum* (Epe *et al.*, 1996) and did not need intermediate host, where they can still contaminate the boxes underneath the animal. These infective larvae can resist the adverse conditions and survive for longer times (Bugg, 1999). Large numbers of these parasites have zoonotic importance and can pollute the conditions surrounding the human beings and other animals (Martinez-Moreno *et al.*, 2007). Even with application of a restricted control measures to these boxes, arrival of rodents and other stray animals as cats can be considered a source of infection for these places even after application of repeated treatment programs (Pullola *et al.*, 2006).

Helminthes infection of these dogs commonly occurs per os while others are more common infecting dogs prenatally or via milk as *T. canis*. These parasites cause cough, pneumonia, restlessness and anaemia for infected dogs (Parsons *et al.*, 1986).

Treatment of these animals is considered as one of the fastest ways for eradication of these parasites, but without complete eradication to the source of re-infection of these animals is still considered as a source for new infection and spreading of the disease (Thompson and Roberts, 2001).

The present study spot more light on types of parasites infecting stray and captive dogs under hygienically different conditions in separate boxes in Beni-Suef Governorate, Egypt. Source of re-infection by some parasites post specific treatment and the requirement for prevention of this was also evaluated. The present work aims to minimize the role of these animals as a source of dangerous diseases preventing them from acting as infectious foci for their surrounding animals and human beings under the common medium to low hygienic precautions.

MATERIALS and METHODS

I- Selection and grouping of animals:

A total number of 200 stray dogs (140 more than one year and 60 lower than one year) taken from Sharq El-Nile area, Beni-Suef, Egypt were examined during this investigation. Fecal samples of these animals were examined by using sedimentation and floatation techniques according to Soulsby (1982).

II- Treatment of infected animals:

The dogs infected with helminth parasites were treated with Fenbendazole (Panacur®) which is broad spectrum anthelmintic (50 mg/kg body weight once a day for 3 consecutive days as described by producer) used in dogs for elimination of gastrointestinal parasites (Thompson and Roberts, 2001).

Also, Praziquantel (Droncit®) is indicated for the removal of *Dipylidium caninum*, *Taenia* sp. and flukes. The recommended dosage of praziquantel varies according to body weight. Smaller animals require a relatively larger dosage because of their higher metabolic rate. The drug was given in a dosage of one tablet/5-7kg B.W. The medication was given, for each animal, via stomach tube to ensure that all animals received the proper dosage according to their weights in order to reach the full effectiveness of the dewormer therapy.

Four weeks after treatment, these dogs were divided into 2 equal groups; the first is kept in floor pin (1.5 x 1.5 m concrete floor pin with wire door), while the other is kept in a metal battery (60 x 60 x 60 cm). The treated dogs in the 2 groups were examined 2 weeks later.

For examination of reinfection, fecal samples were collected from all animals at days –7, zero, 7, 14, 21, 28, 35, and 42 days post treatment.

RESULTS

Examination of fecal samples of 140 dogs more than one year and 60 dogs less than one year revealed that number of infected dogs by helminth parasites was 33 (23.6 %) in dogs more than one year and 12 (20.0 %) in those less than one year.

Table (1) illustrated that dogs more than one year were found to be infected with *T. canis*, *A. caninum*, *Taenia* sp., *D. caninum* and *H. heterophyes* eggs with percentages of 10.0, 5.0, 2.9, 3.6 and 2.1 % respectively. On the other hand, it was found that the examined dogs less than one year were infected with *T. canis*, *A. caninum*, *Taenia* sp. and *D. caninum* eggs with percentages of 10.0, 5.0, 3.3 and 1.7 % respectively.

Four weeks after treatment of the 2 groups of stray dogs captive in separate boxes by using Praziquantil and Fenbendazole, it was found that stray dogs captive in floor pin were found to be still infected with helminth parasites, where the fecal examination of the captive stray dogs in floor pin revealed that 11 (33.33 %) dogs more than one year were found to be infected; showing 3 (9.09 %) cases were infected with *T. canis*, one dog (3.03 %) was found to be infected with *A. caninum*, while 2 dogs (6.06 %) were found to be still infected with *D. caninum*. Also, 2 cases (6.06 %) were still infected with *Taenia* sp. eggs. On the other hand, it was evident that, 5 dogs (41.67 %) less than one year were found to be still infected 4 weeks post treatment; where 2 cases (16.67 %) were found to be infected with *T. canis* and one dog (8.33 %) was found to be infected with both *Taenia* sp. and *D. caninum*.

Examination of captive stray dogs in metal battery 4 weeks post treatment revealed that there was no parasitic infection could be detected in fecal samples which examined 3, 4, 5 and 6 weeks post treatment.

DISCUSSION

The present investigation was designed to confirm that treatment of stray dogs in captivity in order to prepare them for further experimental infections is not enough for elimination of parasites previously recorded in them.

This phenomenon is not only related to the efficacy of the drugs used, but also to the complete disinfection of places of captivity against infective stages of all included parasites (Dalimi *et al.,* 2006).

The present investigation showed that using of metal battery post treatment was found to be more better than floor pin, where it was revealed that the efficacy of the drug used was not sufficient to eliminate the helminthes, but the complete disinfection of places of captivity against infective stages is much necessary to keep the dogs post treatment free from parasites (Thompson and Roberts, 2001).

Our results go parallel with those obtained by Smith *et al.* (1980) and Mousa *et al.* (2001). In addition, Romero (1999); Eguia-Aguilar *et al.* (2005) and Wang *et al.* (2006) found that several numbers of helminthes common in dogs required arthropod intermediate hosts including *D. caninum*. Also, others as *T. canis* and *A. caninum* did not need intermediate hosts, where they still contaminate the boxes underneath the animals.

The fact which in agreement with our results was evident from the experiment that the captivity of the stray dogs in metal battery is more better than the captivity of dogs post treatment in the floor pin. The results which are obvious in the present study, are that the treated dogs kept in floor pin were found to be still infected with helminth parasites 4 weeks post treatment, while the treated dogs kept in metal battery were found to be free from helminth parasites (Habluetzel *et al.,* 2003; Pullola *et al.,* 2006 and Martinez-Moreno *et al.,* 2007).

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Table 1: Prevalence of different helminth parasites recorded in the examined stray dogs before and after treatment under different environmental conditions.

Examined No.				Infected		*Toxocara canis*		*Ancylostoma caninum*		*Taenia spp.*		*Dipylidium caninum*		*Heterophyes heterophyes*	
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Before treatment		› one year	140	33	23.6	14	10.0	7	5.0	4	2.9	5	3.6	3	2.1
		‹ one year	60	12	20.0	6	10.0	3	5.0	2	3.3	1	1.7	-	-
After treatment	Floor pin	› one year	70	11	33.33	3	9.09	1	3.03	2	6.06	2	6.06	-	-
		‹ one year	30	5	41.67	2	16.67	-	-	1	8.33	1	8.33	-	-
	Metal battery	› one year	70	-	-	-	-	-	-	-	-	-	-	-	-
		‹ one year	30	-	-	-	-	-	-	-	-	-	-	-	-