Short Communication
The Journal of Animal & Plant Sciences, 24(1): 2014, Page: 350-353
ISSN: 1018-7081

PREVALENCE AND CHEMOTHERAPY OF COCCIDIOSIS IN DOGS IN AND AROUND LAHORE- PAKISTAN

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ABSTRACT

The present study was undertaken to ascertain the prevalence and chemotherapy of coccidiosis in dogs. For this purpose a total of 300 fecal samples were collected from different dogs in and around district Lahore. All the study animals were divided into three age groups. Collected samples were processed and examined with the help of light microscope for the presence of protozoan oocytes. In present study, overall16.33% prevalence of coccidiosis was recorded. The chi-square analysis revealed significantly ($p<0.001$) higher prevalence of coccidiosis in young dogs. The prevalence of coccidiosis in different age groups such as <6 months, up to 6-12 months and 1-2 year age was 75.51, 6.08 and 3.67% respectively. The frequency analysis (OR=1.41[reciprocal =0.71]) showed non-significant difference in both male and female dogs. However it was non-significantly higher in male (18.67%) as compared to female (14%). The efficacy of sulfadimethoxine and Furazolidone was 98.29 and 96.64% respectively, after 14th dayof treatment, showing the useful effects of both drugs in dogs.

Key words: prevalence; coccidiosis; sulfadimethoxine; furazolidone; dogs

INTRODUCTION

Stray dogs are principal and sole transmitter of different diseases in Asian countries including Pakistan (Hossain*et al.,* 2011; Sudarshan *et al.,* 2007). Human beings have developed very close association with dogs as a pet animal.The intestinal parasites are the most common pathogenic agents and constitute one of the major causes of different lesions of the intestinal tract in dogs (Blagburn *et al.,* 1996). Among various common protozoan *Coccidia, Giardia, Entamoeba, Trichomonas* and *Balantidium coli* are important protozoan parasites that cause a wide range of intestinal problems in dogs (Bowman, 2003). Coccidiosis is a common parasitic disease in a variety of wild and domestic animals. However, in dogs *Isospora* having four species like *Isosporacanis*, *I. ohioensis*, *I. neorivolta* and *I. burrowsi* are the causative agents (Susan, 1998). Dogs are the definitive hosts for these species. The disease occurs in dogs having different ages. However some previous studies have shown that the coccidiosis is more prevalent in young animals as compared to old animals (Papazahariadou *et al.,* 2007). The disease is highly contagious presenting clinical signs such as vomiting, abdominal discomfort, inappetance, anorexia, dehydration, watery diarrhea and feces containing blood (Mitchell *et al.* 2007; Lappin, 2010). Clinical signs and presence of Isospora oocysts are mainly used as diagnostic tools for the identification of coccidiosis in dogs. Previously different anti-coccidial drugs like sulfamethazine and amprolium were successfully used for the treatment of coccidiosis in dogs (Olson, 1985). Sulfadimethoxine in combination with ormetoprim was evaluated as a coccidiostat against experimentally induced coccidiosis in young dogs (Dunbar and Foreyt, 1985).The number of coccidiosis cases was seem increasing from last one year in the Lahore and its surrounding areas and deaths have been observed in young puppies of many precious dogs. To overcome this havoc, proper diagnosis and treatment of coccidiosis is very essential. Keeping in view the importance of coccidiosis in dogs, the present study was designed to determine the actual magnitude of coccidiosis in dogs and to evaluate the efficacy of various drugs against coccidiosis.

MATERIALS AND METHODS

Study area: A total of 300 fecal samples (5gms each) were collected from different dogs, presented at Pet Centre, University of Veterinary and Animal Sciences (UVAS), Lahore and various private clinics in urban and peri-urban areas of Lahore during August 2011 to December 2011. After collection, all the samples were kept in sterile plastic bags separately. The collected samples were processed at Medicine Laboratory, UVAS Lahore using direct smear method and flotation techniques for the examination of oocysts of coccidia. The smears were made by putting a drop of clean water on a clean slide and the fecal sample was mixed. Finally

the cover slips were placed and the slides were examined under the light microscope. Fecal samples which were found negative after light microscopic examination were subjected to floatation method. Briefly, 2 gram of fresh fecal sample was mixed in 20 ml of saturated sugar solution in a glass cylinder. After that the cover slip was placed sideways on the top of cylinder. The slides was removed after 10-20 minutes and examined under light microscope (Zajac and Conboy, 2006). The oocysts were identified according to the method as described by Soulsby (1982).

Chemotherapeutic evaluation: For this purpose a total of 60 dogs (n= 45 positive for coccidia; n= 15 healthy) were divided into four groups (A, B, C and D). Each group was comprised of 15 dogs. Group A and B (coccidia positive dogs) were treated with Sulfadimethoxine @ 60mg/kg/day orally for 3 weeks and furazolidone 20 mg/kg/day for one week, respectively. Group C served as a positive control and group D was kept as negative control. Oocysts per gram (OPG) of dogs were counted at day 0 (Pre-treatment) and days 3, 7, 14 (Post-treatment) by using Mc-Master technique as described by Soulsby (1982). Finally, the efficacy of drugs was calculated as per formula described by Varady*et al.*(2004).

[(Pretreatment OPG - Post treatment OPG / Pretreatment OPG] * 100

Statistical Analysis: The data regarding the prevalence was analyzed by frequency analysis using chi-square test. The percentages and 95% confidence limit for some parameters were determined and where appropriate odd ratio was also computed. While data regarding therapeutic trials analyzed by one way ANOVA using statistical package for the social sciences (SPSS).

RESULTS AND DISSCUSION

The results on prevalence of coccidiosis regarding different age groups and sex are presented in table 1. The results revealed that the fecal samples collected from 300 dogs, 49 (16.33%) was recorded positive for coccidiosis. Previously, different studies reported higher prevalence 18.45%, 18.3% and 18% of coccidiosis in dogs (Ariza-Astolfi *et al.,* 1998; Anene *et al.,* 1996; Nisar *et al.,* 2009). The results of present study are also in consistent to the findings of Guclu and Aydenizoz (1995) who reported 14% prevalence of coccidiosis. In contrast to our results lower prevalence 4.4, 3.9, 8.7, 9.0 and 8.1% of coccidiosis in dogs has been reported (Little *et al.,* 2009; Papazahariadou *et al.,* 2007; Buehl *et al.,* 2006; Lopez *et al.,* 2006; Ramirez-Barrios *et al.,* 2004). The variation in prevalence of coccidiosis could be due to different geographical conditions including host and environmental factors such as atmosphere, diet, immunity, environmental conditions, temperature, humidity and anti-protozoan therapy in the areas under study. The use of anti-protozoan drugs plays significant role in prevalence of the intestinal parasites and epidemiological studies in pet dogs (Carlysle *et al.,* 2008). The results showed non-significantly (P>0.05) higher prevalence of coccidiosis in male (18.67%) as compared to female (14%) dogs. Previously, non-significantly difference in prevalence of coccidiosis in male and female has been reported (Ramirez-Barrios *et al.,* 2004; Papazahariadou *et al.,* 2007). However, in present study, significantly (P<0.001) higher prevalence of coccidiosis was recorded in dogs having <6 month of age as compared to all other age groups. Similar results regarding the prevalence of coccidiosis with age of dogs have been reported (Buehl*et al.,* 2006; Lopez *et al.,* 2006) who showed that dogs having less than 4 months of age are more susceptible to coccidiosis. Significantly higher prevalence of coccidiosis has also been reported in young dogs as compared to adults (Papazahariadou *et al.,* 2007).

The results on oocyst counts in groups A-D are shown in table 2. Significant (*P*<0.05) decrease in oocyst count was observed in group A and B as compare group (C) positive control. The results on comparative efficacy of sulfadimethoxine and furazolidone against coccidiosis are presented in table 3. The results showed that the efficacy of sulfadimethoxine and furazolidone was non-significantly different at different days. The results showed that both drugs are effective against coccidiosis in dogs. The results of this study are similar to the results of Dunber and Foreyte (1985) who found that the efficacy of sulfadimethoxine in combination with ormetoprim was 99.8%.The results of the present study revealed that 96.64% drug efficacy of furazolidine against the coccidiosis in dogs is in close agreement with the findings of Nisar*et al.*(2009), who reported the 95% efficacy of furazolidine against coccidiosis in dogs.

In Pakistan, many farmers keep pet dogs among other farm animals as a guard and the infection can be spread from dogs to other animals and humans. This study showed substantial evidence of this infection in dogs in current study area. From the findings of this study it is suggested that further large scale epidemiological studies should be conducted including more districts and more number of cases for identification and molecular diagnosis of causative agents of coccidiosis. Moreover, strategies should be made to eliminate transmission factors like provision of clean infection free environment and right efficacious drug should be administered in proper dosage for achieving complete recovery and to avoid drug resistance.

Table 1: Prevalence of coccidiosis (Isosporiosis) in dogs of different age groups

Sex/ age	No. of Animal	Positive		95% CI	Odd Ratio/ P-value
		N	%		
Male	150	28	18.67	13.03-25.50	OR=1.41[reciprocal =0.71]
Female	150	21	14.00	9.12-20.26	
Total	300	49	16.33	12.47-20.84	
Age groups					
<6 months	49	37	75.51	62.08-86.00	Mantel-Haenszel Chi-sq
6-12 months	115	7	6.08	2.70-11.67	P<0.001
1-2 years	136	5	3.67	1.36-7.96	

Table: 2 Oocysts count at various days before and after treatment.

Parameter/Sampling day	Groups			
	A	B	C	D
	Oocysts count per gram (mean ± SE)			
0	1054±72.40	1043±82.90	1020±80.90	00.00±00.00
3	351.0±68.40	376.0±59.40	1256 ±111.5	00.00±00.00
7	96.00±17.70	117.0±18.90	1594 ±177.1	00.00±00.00
14	18.00±07.80	35.00±11.50	1996 ±274.4	00.00±00.00

(P> 0.05, df = 3)

Table 3: Comparative efficacy (%) of sulphadimethoxine and Furazolidone at various days of treatment

Sampling Days	Drugs	
	Sulphadimethoxine*	Furazolidone*
0	0	0
3	66.69	63.95
7	90.89	88.78
14	98.29	96.64

(P-value = 0.000, *highly significant).

REFERENCES

Anene, B. M., T. O. Nnaji and A. B. Chime (1996). Intestinal parasitic infection of dogs in the Nsukka area of Enugu state, Nigeria. Prev. Vet. Med., 27 (1-2): 89-94.

Ariza-Astolfi, C., O. J. M. Ubeda, V. M. Merida, M. F. Reina, M. Rojas-Alvarez and S. C. Lozano, (1998). Intestinal parasites in stray dogs from Seville province. Medicina-Veterinaria. 15 (9): 494-496.

Blagburn, B. L., D. S. Lindsay, J. L. Vaughan, N. S. Rippey, J. C. Wright, R. C. Lynn, W. J. Keltch, G. C. Ritchie and D. I. Helper. (1996). Prevalence of canine parasites based on faecal floatation. Comp. Cont. Educ. Pract. Vet. 18(5):483-509.

Bowman, D. D. (2003). Georgi's Parasitology For Veterinarians. 8th Edi. Saunders Company, U.S.A. pp. 311-317.

Buehl, I. E., H. Prosl, H. C. Mundt, A. G. Tichy and A. Joachim. (2006). Canine isosporosis - epidemiology of field and experimental infections.J vet Med B Infect Dis Vet Public Health. 53 (10):482-7.

Carlysle, S. P., T. R. C. Andrew, J. T. Rebecca, R. C. Robert and D. R. Ian. (2008). National study of the gastrointestinal parasites of dogs and cats in Australia. Veterinary Parasitology. 151(2-4):181–190.

Dunbar, M. R. and W. J. Foreyt. (1985). Prevention of coccidiosis in domestic dogs and captive coyotes (Canislatrans) with sulfadimethoxine-ormetoprim combination. Am J Vet Res. 46(9): 1899-902.

Guclu, F. and M. Aydenizoz (1995). The prevalence of parasites in the faeces of dogs in Konya. Turkiye-Parazitoloji-Dergisi. 19(4): 550-556.

Hossain, M., T. Bulbul, K. Ahmed, Z. Ahmed, M. Salimuzzaman, M. S. Haque, A. Ali, S. Hossain, K. Yamada, K. Moji and A. Nishizono (2011). Five-year (January 2004–December 2008) surveillance on animal bite and rabies vaccine utilization in the Infectious Disease Hospital, Dhaka, Bangladesh. Vaccine., 29(5): 1036-1040.

Lappin, M. R. (2010). Update on the Diagnosis and Management of Isosporaspp Infections in Dogs and Cats. J. Tcam. doi:10.1053

Little, S. E., E. M. Johnson and D. Lewis (2009). Prevalence of intestinal parasites in pet dogs in the United States. Vet Parasitol. 166:144-152.

Lopez, J., K. Abarca, P. Paredesand E. Inzunza. (2006). Intestinal parasites in dogs and cats with gastrointestinal symptoms in Santiago, Chile.Rev Med Chil.134(2):193-200.

Mitchell, S. M., A. M. Zajac, S. Charles, R. B. Duncan and D. S. Lindsay. (2007). Cystoisosporacanisnemeseri, 1959 (syn. Isosporacanis), infections in dogs: clinical signs, pathogenesis, and reproducible clinical disease in beagle dogs fed oocysts. J. Parasitology.10.1645/ge-1024r.1.

Nisar, M., J. A. Khan, M. S. Khan and I. A. Khan (2009). Prevalance of coccidiosis in dogs along with haematological alterations as a result of chemotherapeutic trial.Pakistan Vet. J., 29(3): 138-140.

Olson, M. E. (1985). Coccidiosis Caused by Isosporaohioensis-like Organisms in Three Dogs.Can Vet J. 26(3):112-4.

Papazahariadou, M., A. Founta, E. Papadopoulos, S. Chliounakis, S. K. Antoniadou and Y. Theodorides. (2007). Gastrointestinal parasites of shepherd and hunting dogs in the Serres Prefecture, Northern Greece. Veterinary Parasitology, 148 (2). 170-173.

Ramirez-Barrios, R. A., M. G. Barboza, J. Munoz, C. F. Angulo, E. Hernández, F. González and F. Escalona (2004). Prevalence of intestinal parasites in dogs under veterinary care in Maracaibo, Venezuela.Vet Parasitol. 121 (1-2):11-20.

Soulsby, E. J. L. (1982). Helminths, Arthropods and Protozoa of Domesticated Animals, 7th Ed. BailliereTindall, London U. K.

Sudarshan M. K., S. N. Madhusudana, B. J. Mahendra, N. S. Rao, D. H. A. Narayana, S. A. Rahman, F. Meslin, D. Lobo, K. Ravikumar and Gangaboraiah (2007). Assessing the burden of human rabies in India: results of a national multi-center epidemiological survey. International J. Infectious Diseases. 11(1): 29-35.

Susan, A. E. (1998). Merck Veterinary Manual 8th Ed. Merck and Co. Inc., USA; pp 140.

Varady, M., A. Konigpva and J. Corba. (2004). A field study to evaluate the efficacy of Fenbandazole on 9 stud farms. Vet. Med. Czech., 49: 42-46.

Zajac, M. A. and G. A. Conboy (2006). Veterinary Clinical Parasitology 7th Ed. Blackwell Parasitology 2121 State Avenue, Ames IOWA 50014, U.S.A.