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THE PREVALENCE OF ASCARIASIS IN STRAY DOGS IN ANKARA

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Ankara sokak köpeklerinde ascariasis'in yayılışı

Özet: *Ankara sokak köpeklerinde görülen askarit türlerinin yayılışını saptamak amacıyla* 182 *köpeğin dışkı ve otopsi bakısı yapıldı. Otopsi bakılarında* 126 (% 69.23) *köpekte askarit enfeksiyonu tespit edildi. Bakısı yapılan köpeklerin* 95 (% 52.19) *inde Toxascaris leonina*'ya, 40 (% 21.97) *inda Toxocara canis'e,* 1 (% 0.54) *inde de Toxocara cati'ye rastlandı.*

Dışkı bakılarında ise ancak 95 *(%* 52.19*) köpekte askarit enfeksiyonu saptandı. Bu yöntemle köpeklerin* 62 *(%* 34.06*) sinde T. leonina,* 32 *(%* 17.58*) sinde T. canis* ve 1 *(%* 0.54*) inde de T. cati yumurtası tespit edildi. Ayrıca bir köpeğin dışkı bakısında Ascaris lumbricoides yumurtası saptandı. Ancak otopside parazite rastlanılmadı.*

Summary: *This study was carried out to determine the prevalence of ascarid species in stray dogs in Ankara. Determination of the prevalence of infections was based on both faecal examination and autopsy. Of the* 182 *stray dogs autopsied* 126 *(*69.23 %*) were found to be infected with different ascarid species consisting of Toxascaris leonina (*52.19 %*), Toxocara canis (*21.97 %*) and Toxocara cati (*0. 54 %*).*

Whereas, 95 *(*52.19 %*) of the* 182 *faecal samples examined by flotation technique were positive for ascarid eggs. Ascaris lumbricoides eggs were observed in faecal examination of one dog, but adult parasites were not found at autopsy.*

Introduction

Ascariasis is one of the common helminth diseases of dogs in many parts of the world (1, 2, 5, 6, 23, 32). Previous studies indicate

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that ascarid species, especially *Toxascaris leonina* and *Toxocara canis* are also very common helminths of dogs in Turkey (7, 10, 17, 18, 25, 29). In addition to their well known veterinary importance some ascarid species such as *T. canis* and *T. cati* are also the most prevalent causes of visceral larva migrans in man. Therefore the prevalence of ascarid species of dogs has both veterinary and public health interest (11, 26, 33).

Nowadays, keeping of dogs as pets is becoming more popular in Turkey. Further, there is a large number of stray dogs. Especially, the incidence of infection is highest in these animals (1, 8, 9, 21). The purpose of this study was to determine a more recent prevalence of ascarid species in these animals in Ankara based on records of both faecal examinations and autopsy findings.

Materials and Methods

One hundred eighty-two stray dogs of different ages and sexes were examined in this study. Dogs were supplied as dead by dog-shooters of the State Veterinary Department during their campaing on destruction of stray dogs in Ankara. The age (under 1 year and over 1 year) and sex of each animals were recorded.

Faecal samples were taken from rectum of dogs and examinations were performed by the use of saturated salt (NaCl) flotation technique. Ascarid eggs found by flotation were identified using morphological criteria (11, 14).

At necropsy, the gastro-intestinal tract was examined for ascarids. Recovered worms were fixed in 5 % formalin and were identified microscopically. Identification was based on the description of Dunn (11), Georgi et al. (14), Sprent and Barret (28). Especially, the presence or absence of a ventriculus intercalated between the esophagus and intestine was important criterion in the identification of immature, adult *T. leonina* and *T. canis* (Figure 1).

Results

Of the 182 stray dogs autopsied 126 (69.23 %) were found to be infected with a total of three ascarid species. The most frequently observed ascarid species was *Toxascaris leonina* with percentage of 52.19. *Toxocara canis* and *Toxocara cati* were found in 21.97 % and 0.54 % of the dogs respectively (Table 1).

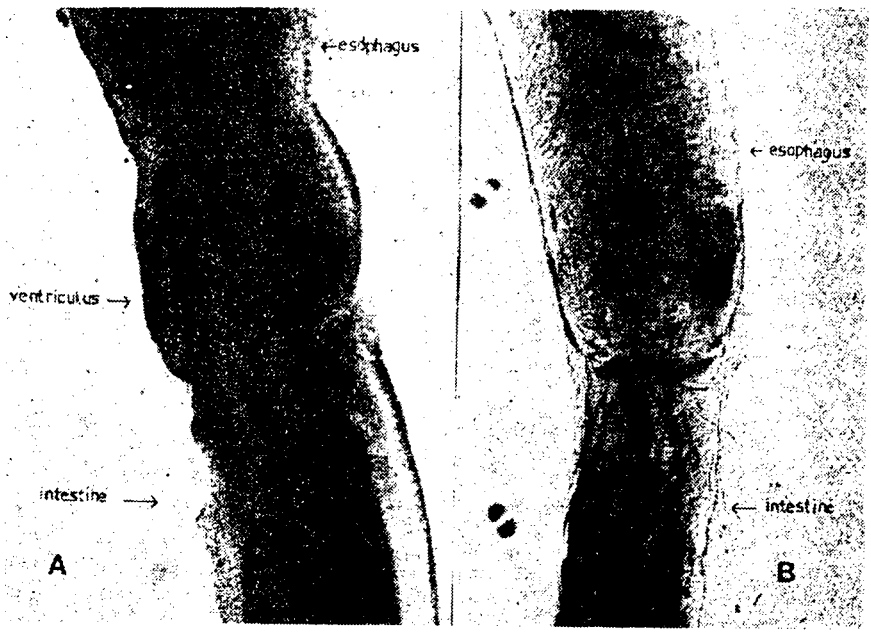

Figure 1. Junction between esophagus and intestine in Toxocara canis (A) and Toxascaris leonina (B).

Table 1. Prevalence of ascarid species found by faecal flotation and autopsy of dogs.

Ascarid species	In faeces examination		At autopsy	
	No. of dogs infected	%	No. of dogs infected	%
Toxascaris leonina	62	34.06	95	52.19
Toxocara canis	32	17.58	40	21.97
Toxocara cati	1	0.54	1	0.54
Ascaris lumbricoides	1	0.54	—	—

The infection rate of female dogs (72.72 %) was higher than that of males (65.95 %). But there were no significant differences in prevalence rates between age groups (under 1 year and over 1 year). The distribution of ascarid species in relation to age and sex are shown in Table 2 and 3, respectively. Contrary to the prevalence of *T. leonina*, *T. canis* infections were found in young dogs more frequently than n adults (Table 2). As shown in Table 2 polyinfections were less common than infections with a single ascarid species.

Table 2. Relation of infection rate of ascarid species to age of dogs

Ascarid species	Young dog (under 1 yr.)			Adult dog (over 1 yr.)		
	No. of dogs examined	No. of dogs infected	%	No. of dogs examined	No. of dogs infected	%
T. leonina	58	18	31.03	124	67	54.03
T. canis	58	17	29.31	124	13	10.48
T. cati	58	1	1.72	124	—	—
T. leonina + T. canis	58	5	8.62	124	5	4.03
Total	58	41	70.68	124	85	68.54

Table 3. Relation of infection rate of ascarid species to sex of dogs

Ascarid species		Female			Male		
		No. of dogs examined	No. of dogs infected	%	No. of dogs examined	No. of dogs infected	%
Mono İnfect.	T. leonina	88	42	47.72	94	43	45.74
	T. canis	88	15	17.04	94	15	15.95
	T. cati	88	—	—	94	1	1.06
Poly İnfect.	T. leonina+T. canis	88	7	7.95	94	3	3.19
Total		88	64	72.72	94	62	65.95

The number of worms collected per dog ranged from 1 to 90. The mean worm burden of *T. leonina*, *T. canis* and *T. cati* was 8.7, 6.3 and 5, respectively (Table 4).

On the other hand, 95 (52.19 %) of the 182 faecal samples examined by flotation technique were positive for ascarid eggs. The comparison of flotation and autopsy findings are summarized in Table 1. In addition to the Toxocara *(T. canis, T. cati)* and Toxascaris *(T. leonina)* eggs, *Ascaris lumbricoides* eggs were observed in faecal samples of one dog. But adult *A. lumbricoides* was not found at autopsy in this animal.

Discussion

In general, results from this study show ascarid patterns consistent with those reported by others (4, 7, 9, 18, 22, 29) using autopsy and faecal examination although some differences were noted.

In the present study, 126 stray dogs autopsied out of 182 (69.23 %) were found to be infected with ascarid species. Also the infection rate was detected of 52.19 % in faecal examinations. As shown in Table 5, this infection rates are higher than in the reports previously mentioned in Turkey (4, 12, 16).

Of the as carid species detected at autopsy, *T. leonina* was found most frequently with a percentage of 52.19. This result is similar to those reported by Budak et al. (4), Doğanay (9), Mimioğlu et al. (22), Taşan (29) and Zeybek (33). Contrary to findings of Güralp et al. (17), Pamukçu and Ertürk (24) and Tınar et al. (30). Whose reports indicate that *T. canis* infections were found most commonly in dogs. Generally, the incidence of *T canis* has been also found higher than that of *T. leonina* in other countries (2, 6, 19, 20, 23, 31, 32). The prevalence of *T. canis* in this study is close to that reported in some of the earlier papers in Turkey (9, 21, 21, 29).

Toxocara cati was detected in one dog (0.54 %) in this study. This ascarid species has been also found in two dogs in Turkey by Pamukçu and Ertürk (24).

The prevalence of *T. canis* infection in young dogs is known to be much higher than in adult dogs (3, 8, 9, 13, 15). *Toxocara canis* infections were also found in young dogs (under 1 year) more frequently

Table 4. Severity of worm burdens found at autopsy of dogs

Age group of dogs	Sex of dogs	Number of worms found									Total
		T. leonina			T. canis			T. cati			
		M.	F.	İm.	M.	F.	İm.	M.	F	İm.	
Under 1 yr.	Male	11	16	6	9	13	3	2	3	—	63
	Female	70	97	32	49	67	16	—	—	—	331
Over 1 yr.	Male	116	128	23	32	37	7	—	—	—	343
	Female	110	171	49	8	8	2	—	—	—	348
Total		307	412	110	98	125	28	2	3	—	1085
		829			251			5			
No. of worms per dog min-max (Average)		1–90 (8.7)			1–37 (6.3)			5			

M: Male F: Female Im: Immature

Table 5. Prevalence of ascarid species found in dogs in Turkey

Authors	Method	Total percentage of ascariasis %	Incidence of ascarid species			
			T. leonina %	T. canis %	T. cati %	A. lumbricoides %
Mimioğlu et al., (1959)	autopsy	—	28	20	—	—
Güralp, (1957)	faecal	28.57	38.88*	54.16*	—	6.94*
Pamukçu and Ertürk, (1961)	autopsy	—	—	13.24	0.32	—
Merdivenci, (1962)	faecal	—	23.5	22.7	—	1.4
Ertürk and Tanzer, (1973)	autopsy	4.5	0.19	4.10	—	—
Güralp et al., (1977)	autopsy	—	28.57	44.76	—	—
Taşan, (1982)	autopsy	—	67	26	—	—
Doğanay, (1983)	autopsy faecal	—	62 42	24 16	—	—
Budak et al., (1986)	autopsy	9.33	67.86**	32.14**	—	—
Tınar et al., (1989)	autopsy	—	25	39	—	—
Çerçi, (1990)	faecal	—	42.97	13.22	—	—
Saygı et al., (1990)	autopsy	—	80	28	—	—
Zeybek et al., (1992)	autopsy	—	51.15	15.15	—	—
Hasslinger et al., (1993)	faecal autopsy	—	38.75 23.33	15.0 36.66	—	—
Present authors	autopsy faecal	—	52.19 34.06	21.97 17.58	0.54 0.54	— 0.54

* Percentage of ascarids collected ** According to infected animals

than in adults (over 1 year) in present study. But there were no significant differences observed in the overall incidence of ascariasis between age groups. Also, no significant differences were observed in the prevalence rates in male and female dogs. This results is in agreement with the reports of others (8, 23, 27).

It was interesting to note that one dog showed *Ascaris lumbricoides* eggs in the faeces, but not in autopsy. Also, the similar results had been reported by Güralp (16) and Merdivenci (21) who accepted this cases as a pseudoparasitism.

In conclusion, these results indicate that ascariasis is the most prevalent helminth infection in dogs in Turkey, Therefore, these animals may play a significant role as visceral larva migrans reservoirs in this country.

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