



Prevalence of Feline Giardiasis in Khartoum State, Sudan

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ABSTRACT:

The study was extended for two years and covered different seasons of the years 2021 and 2022. The study was aiming at investigating the prevalence of Feline Giardiasis among cats. A total of 133 cats from different breeds, ages and different localities of Khartoum State were investigated for the presence of Feline Giardiasis. According to parasitological examination, the prevalence of feline Giardiasis in Khartoum State was 39.1% which is high. Male and female cats had the same risk of Giardiasis with the prevalence of 20.3% and 18.8% respectively. All the ages of the cats were susceptible for Giardiasis. Cats were susceptible for the infestation of Giardiasis in all seasons of the year. According to ANOVA test, the season has no significant effect (p-value= 0.962) on Feline Giardiasis. Local and cross breeds of the cats were more susceptible for Giardiasis. According to ANOVA test, breed has no statistical significant differences (p-value= 0.450) between the main feline breeds in the prevalence of Feline Giardiasis. Ninety-two point three of Feline Giardiasis cases respond for the treatment trials using Metronidazole.

This is the first study concerning investigation of Feline Giardiasis in Khartoum State. Vaccination and Deworming programs against different diseases are recommended for cats in Khartoum State.

Key words: Feline; Giardiasis; Khartoum State; Protozoal infestation; Sudan

I. INTRODUCTION:

Giardia is a flagellated parasite, both of them parasitize in the intestine of the most mammals, birds and reptiles [1]. Giardiasis is considered as most prominent intestinal parasitic infection among companion pets (dogs and cats) in the developing countries. Giardia species belong to phylum Fornicata class Trepanonadea family Giardidae; can be classified according to host origin and morphology of the trophozoites basically by the appearance of the median bodies [2, 3]. Depending on the origin of the host, three prominent morphological trophozoites were identified named: Giardia lamblia also known Giardia duodenalis parasites on both birds and mammals, Giardia muris parasites on rodents, and Giardia agilis toads [4]. *G. intestinalis* is classified into eight assemblages that have different host specificities. Assemblages A and B are found in humans and other mammals, C and D in canids, E in ungulates animals, F in cats, G in rodents, and H in pinnipeds. Assemblages A and B are considered zoonotic [5]. *Giardia Felis* is found in cats throughout the world. Cats can do develop clinical signs from infections with *Giardia Felis*. The typical sign is diarrhea [6]. Several formulations of benzimidazoles have activity against *Giardia* infections. A similar treatment (25 mg/kg body weight orally twice daily for two days) did not work in cats [7]. Albendazole has been associated with bone marrow aplasia in one cat when used to treat giardia infection [8]. Fenbendazole has been shown to stop beagles from shedding cysts in their feces at the dosage routinely applied for anthelmintic therapy (50 mg/kg body weight orally once a day for three days) [7]. Other drugs used to treat *Giardia* infections in cats have included quinacrine, metronidazole, and furazolidone [9].

This study was aiming at investigating Feline Giardiasis in Khartoum State, Sudan.

II. MATERIALS AND METHODS:

Area of the study:

The study conducted in Khartoum State during the years 2020, 2021 and 2022.

Samples:

Source of samples:

In this study which lasted for 2 years, 133 cats of different ages and breeds were investigated for presence of Feline Giardiasis. Faecal samples were collected during this investigation from all animals.

Breeds of cats:

The investigated cats were belonged to Local, Shirazi, cross, Persian, Moon face, Himalaya and Chinchilla breeds of cats.

Ages of cats:

The age of the investigated cats was ranged between 2 and 14 months.

Sampling Procedure:

A total of 133 Faecal samples were from 599 cats in different Localities of Khartoum State. Faecal samples were collected directly from rectums of the cats by using swabs. Faecal samples were transported in iceboxes to the Veterinary Laboratory in college of Veterinary Medicine University of Bahri.

Detection of Giardiasis:

Fecal sample was mixed with a drop of normal saline (0.9%) and iodine on a clean glass slide (75 X 26 mm). A cover glass (22 X 22 mm) was placed carefully and then examined by light microscopy using (10x) and (40x) objective lenses. Trophozoites or cysts were identified in canine feces. Trophozoites are pear –shape, with flagella and motile. Cysts are oval non motile [10].

Treatment trial for Feline Giardiasis cases:

All cases of Feline Giardiasis cases were subjected for the treatment trials using Metronidazole [1].

III. RESULTS:

Prevalence of Feline Giardiasis in Khartoum State:

Among 133 cats of different breed, sex and age, 52 (39.1%) were positive for Giardiasis. Male cats represented 20.3% and females represented 18.8% of the positively tested cats. The age of the infected cats ranged in between 2 and 14 months (Table 1 and Figure 1).

Prevalence of Feline Giardiasis in autumn:

The prevalence of Feline Giardiasis in autumn was 14 (36.9%). Male cats represented 13.2% and females represented 23.7% of the positively tested cats (Table 2).

Prevalence of Feline Giardiasis in winter:

The prevalence of Feline Giardiasis in winter was 14 (25.0%). Male cats represented 14.3% and females represented 10.7% of the positively tested cats (Table 3).

Prevalence of Feline Giardiasis in summer:

The prevalence of Feline Giardiasis during the summer was 11 (31.4%). Male cats represented 14.3% and females represented 17.1% of the positively tested cats (Table 4).

Prevalence of Feline Giardiasis in different cat breeds:

Among 52 cats of different breed, the prevalence of Feline Giardiasis was 65.4% in local breed, 21.2% cross, 5.8% Shirazi, 3.8% and 1.9% Persian and Moon face (Figure 2).

Treatment trial for Feline Giardiasis cases:

Ninety-two point three of Feline Giardiasis cases respond for the treatment trials (Figure 3).

Table (1): Prevalence of Feline Giardiasis in Khartoum State.

Breed	Infected	Healthy	Infected	Healthy	Total
	Male	Male	Female	Female	
Local	21	33	13	16	83
Shirazi	1	4	2	12	19
Cross	5	3	6	4	18
Persian	0	2	1	2	5
Moon face	0	2	1	1	4
Himalaya	0	1	2	0	3
chinchilla	0	0	0	1	1
Total	27	45	25	36	133
	(20.3%)	(33.8%)	(18.8%)	(27.1%)	(100.0%)

Table (2): Prevalence of Feline Giardiasis in Khartoum State in autumn.

Breed	Infected	Healthy	Infected	Healthy	Total
	Male	Male	Female	Female	
Cross	5	3	6	2	16
Local	0	10	0	2	12
Shirazi	0	2	1	2	5
Persian	0	1	1	0	2
Moon face	0	1	0	1	2
Himalaya	0	0	1	0	1
Total	5	17	9	7	38
	(13.2%)	(44.7%)	(23.7%)	(18.4%)	(100.0%)

Table (3): Prevalence of Feline Giardiasis in Khartoum State in winter.

Breed	Infected	Healthy	Infected	Healthy	Total
	Male	Male	Female	Female	
Local	7	18	5	9	39
Shirazi	1	5	1	8	15
Himalaya	0	0	0	1	1
chinchilla	0	0	0	1	1
Total	8	23	6	19	56
	(14.3%)	(41.1%)	(10.7%)	(33.9%)	(100.0%)

Table (4): Prevalence of Feline Giardiasis in Khartoum State in summer.

Breed	Infected	Healthy	Infected	Healthy	Total
	Male	Male	Female	Female	
Local	5	7	4	6	22
Shirazi	0	0	1	5	6
Persian	0	1	0	2	3
Cross	0	0	0	2	2
Moon face	0	1	1	0	2
Total	5	9	6	15	35
	(14.3%)	(25.7%)	(17.1%)	(42.9%)	(100.0%)



Fig. (1): Feline Giardiasis under microscopy.

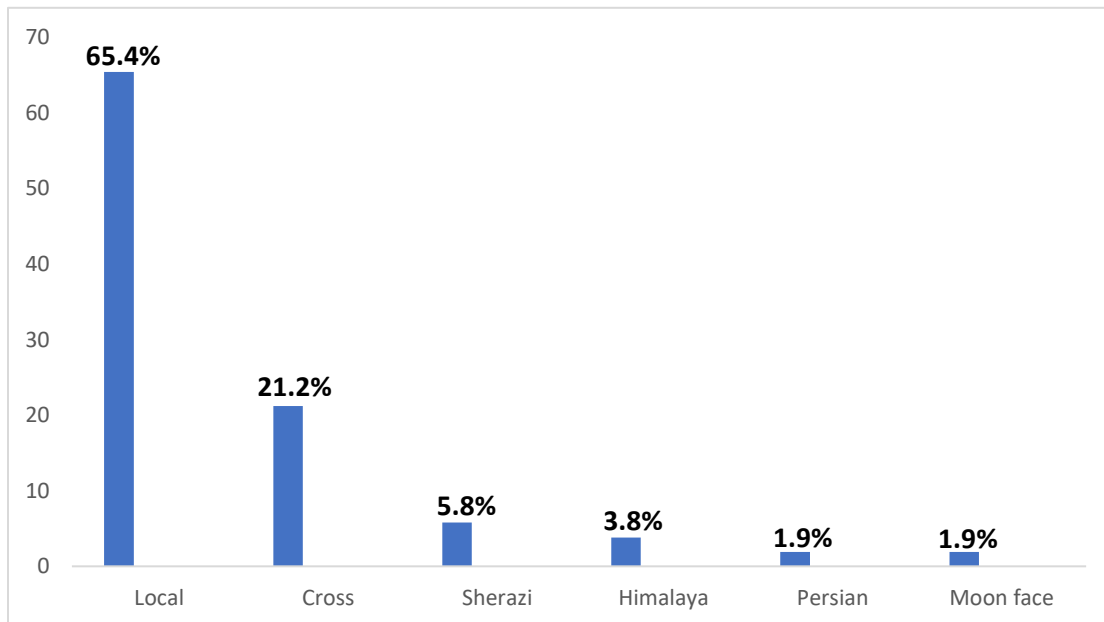


Fig. (2): Prevalence of Feline Giardiasis in different cat's breeds.

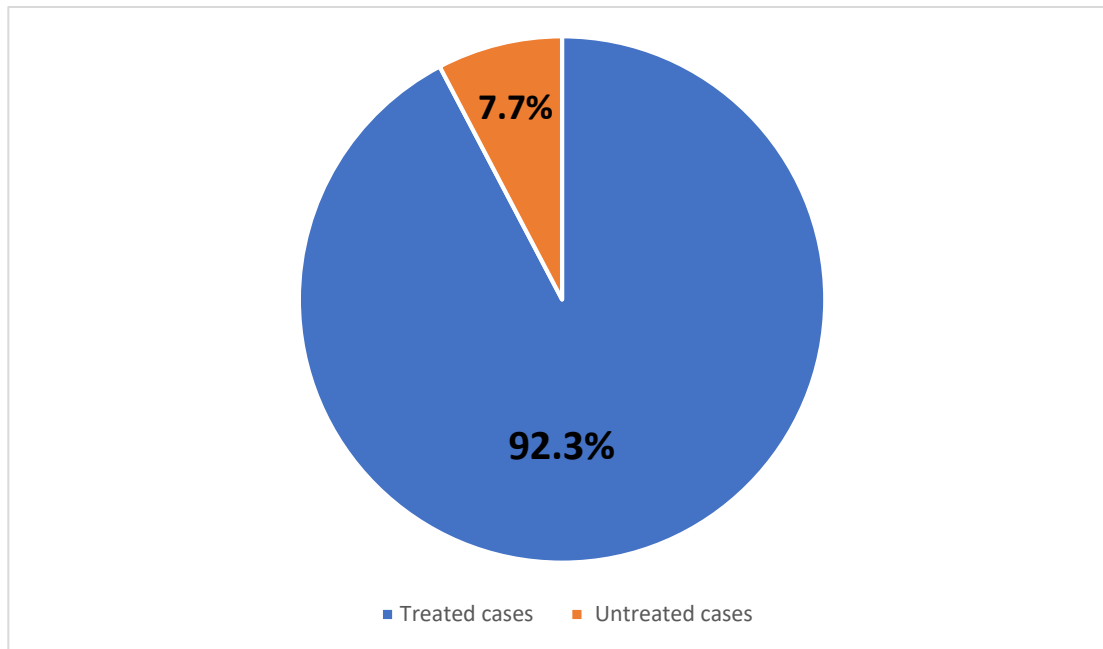


Fig. (3): Treated cases of Feline Giardiasis.

IV. DISCUSSION:

Increasing levels of infection with Giardiasis have several possible reasons, the routine and use of anthelmintic drugs, decreases the prevalence of helminth parasites in contrast, intestinal protozoa are widely unaffected by the anthelmintic and also poor standards sanitations, poor hygiene and large population numbers of stray cats and dogs [1]. In this study the prevalence of Feline Giardiasis in Khartoum State was 39.1%. In Thailand, Wichitrojkitikhun *et al.* [11] reported lower prevalence 0.3% of Feline Giardiasis. Also Khine *et al.* [12] and Tangtrongsup *et al.* [13] reported that the prevalence of feline *G. duodenalis* was 27.3% in Thailand. In USA Carlin *et al.* [14] reported *Giardia* prevalence of 10.8% among tested cats. In UK Maha *et al.* [15] reported that pooled prevalence rates were 12% for Cats. In Brazil Mendoca *et al.* [16] reported prevalence of feline Giardiasis ranging from 1 to 11%. In the present study the prevalence of Feline Giardiasis in male cats was 20.3% and 18.8% in females. In the opposite side in Thailand Pipia *et al.* [17] and in China [18] reported that female cats were more prone to infection than male ones. In the present study the age of the infected cats ranged in between 2 and 14 months. That we were in agreement with [17] in Thailand and Yang *et al.* [18] in China findings that young ages are more susceptible for the disease. In the present study the prevalence of Feline Giardiasis in autumn was 36.9%, in winter 25.0% and in summer was 31.4%. So we are in agreement with Sahatchai Tangtrongsup *et al.* [19] findings that *Giardia* increases during wet and cold seasons. But also we reported high prevalence of Feline Giardiasis during summer. In the present study the prevalence of Feline Giardiasis was 65.4% in local breed, 21.2% cross, 5.8% Shirazi, 3.8% and 1.9% Persian and Moon face breeds. We didn't find similar studies at breed levels to compare with. In this study the survival rate was 92.3% among treated cats and according to Peter *et al.* [20] the treatment of Giardiasis is now very effective.

V. CONCLUSION AND RECOMMENDATIONS:

The prevalence of feline Giardiasis in Khartoum State was 39.1% which is high. Male and female cats had the same risk of infection with the disease. All the ages had the same chance for the infestation. Cats were susceptible for the infestation in all seasons of the year. Local and cross breeds of the cats were more susceptible for the disease. Most cases of Feline Giardiasis were treatable. **Diseased cats must be treated early for good prognosis. Diseased cats must be separated from healthy cats to prevent spread of infection. Hygiene during infection and sanitizing of fomite, food and water dishes must be done.**

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