

Prevalence of Gastrointestinal Parasites of Stray Cats: A Case Study of Two Hospitals in Sokoto Metropolis, Sokoto, Nigeria

Raji AA^{1*}, Magaji AA², Bello MB¹, Lawal MD³, Mamuda A³ and Yahaya MS⁴

¹Department of Veterinary Pathology, Usmanu Danfodiyo University, Sokoto, Nigeria

²Department of Veterinary Public Health and Preventive Medicine, Usmanu Danfodiyo University, Sokoto, Nigeria

³Department of Veterinary Parasitology and Entomology, Usmanu Danfodiyo University, Sokoto, Nigeria

⁴Department of Theriogenology and Animal Production, Faculty of Veterinary Medicine, Usmanu Danfodiyo University, Sokoto, Nigeria

Abstract

Parasitological examination using concentration techniques, which included sedimentation (Formol-Ether) and floatation technique (Sucrose) were employed on the faecal samples of twenty-six (26) cats, comprising of juveniles and adult cats. The cats were stray cats roaming around the study areas. Ten (10) different types of parasites were found to be infecting the cats. Mixed infection with more than one genus of helminthes was also observed. The public health significance of the parasites and the need for their control were discussed.

Keywords: Gastrointestinal parasites; Stray cats; Public health; Hospitals; Sokoto; Nigeria

Introduction

People's reasons for having cats vary, but most owners indicate that personality and appearance are important features [1]. The cat still controls rodents, but closer contact with humans is adding new dimensions of purpose [2]. These stray cats are also important in the epidemiology of feline diseases in Nigeria [3]. They constitute a pertinent reservoir for parasites transmitted to man [4].

It has been known for over 29 years that helminthes parasites of cats are capable of infecting man and causing disease [5], since then, a considerable body of literature has accumulated on the epidemiology and public health aspects of feline helminth parasites [6].

Cats and other felines act as definitive hosts for many intestinal parasites, some of which are responsible for several zoonotic diseases, such as toxocarasis. It is caused by the ascarids of dogs and cats: *Toxocara canis* and *Toxocara cati*, respectively [6,7]. The close association between cats and humans is responsible for the high endemicity of some of these zoonotic diseases [8]. The cestodes, nematodes and acanthocephalans have been identified in the intestine of stray and pet cats in various countries. Transmission of certain helminth parasites of carnivores to domestic animals and man causes economic problems and public health hazards [9]. Therefore, the study of the parasite fauna of carnivores, such as stray cats in various parts of the country is necessary for control of these diseases, which apart from affecting the health of the animal species, also can affect humans.

Gastrointestinal parasites constitute a major source of diseases for cats in the tropics, and have been recognized as important public health problems in several parts of the world [4]. Studies of gastrointestinal parasites of cats in several parts of the country have been limited to the stray cat population [10]. In Sokoto, like it is in so many villages, towns and cities in Nigeria, a large number of cats for which neither housing nor food are provided, roam around to fend for them and breed. These are the categories cats commonly found in the two hospitals in this study.

Materials and Methods

Area of study

The study covers 2 hospitals herein designated as hospital A and

hospital B. Period of sample collection was from February to April, 2007.

Samples collection

Post-mortem examinations were carried out on 26 domestic stray cats collected from Hospital A and Hospital B, Sokoto, after being euthanized with 10% chloroform. After physical examination and before performing necropsy on the cats, their sexes and age-weight were noted, juveniles (<1.4 kg) and adults (>1.5 kg), as described by Sharif et al. [11]. After euthanasia, gastrointestinal tract from the pylorus to the caecum was removed and examined microscopically for parasites using procedure carried out by Abu-Madi et al. [12]. All adult helminthes were collected, preserved and identified as described by Yamaguti [13].

Parasites identification

This was based on microscopic appearance of the eggs, cysts, and/or larvae encountered during examination of each of the samples under 10X and 40X magnification. Microscopic appearances of the parasites were then compared with those in standard texts, literature and micrographs.

Methods of examination

Concentration methods, which included sedimentation using formol-ether and floatation technique using sucrose, were employed. Flotation procedures vary from the simple to the complex. The simplest procedure involves mixing a small amount of feces with flotation solution in a cylinder (shell vial or centrifuge tube), and then adding solution, until the cylinder is nearly full [14]. A further refinement of the flotation technique involves centrifugation to spin down the debris and allow the eggs to float to the surface of the solution, where they can

***Corresponding author:** Raji AA, Department of Veterinary Pathology, Usmanu Danfodiyo University, Sokoto, Nigeria, E-mail: araji@udusok.edu.ng

Received July 16, 2013; **Accepted** August 19, 2013; **Published** August 23, 2013

Citation: Raji AA, Magaji AA, Bello MB, Lawal MD, Mamuda A, et al. (2013) Prevalence of Gastrointestinal Parasites of Stray Cats: A Case Study of Two Hospitals in Sokoto Metropolis, Sokoto, Nigeria. J Bacteriol Parasitol 4: 175. doi:[10.4172/2155-9597.1000175](http://dx.doi.org/10.4172/2155-9597.1000175)

Copyright: © 2013 Raji AA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

be recovered [14]. The procedure of the two techniques was carried, out as described by Dryden et al. [14].

Results

Altogether, 26 stray cats were used in this study. Parasitological examination revealed 10 different parasites (Table 1). Fourteen (14) (53.85%) were males, 12 (46.15%) were females. Based on the ages, matured cats 10 (38.46%) and kittens 16 (61.54%). Overall, 21 (80.77%) of the cats from the 2 hospitals were positive for one parasite or another (Table 2). *Toxocara cati* and *Ancylostoma tubaeforme* had the highest prevalence with 5 (16.67%) prevalence each.

Discussion

Higher figures were reported by Umeche and Ima [10] for *Toxocara cati*, (28.85%), *Ancylostoma tubaeforme*, (19.23%), *Dipylidium caninum* (23.08%) and *Taenia taeniaeformis* (9.61%), in a study on 52 cats undertaken in Calabar, Nigeria. This is in contrast with figures of 16.67% for both *T. cati* and *Ancylostoma tubaeforme*, 13.33% for *D. caninum* and 6.67% for *T. taeniaeformis* reported in this study. This could be from the difference in the techniques employed. Formol-ether and sucrose were used in our study, as against direct smear and zinc sulphate flotation technique used in the other. However, in both two studies, no trematode parasites were detected. *Taenia taeniaeformis* is associated with rodents hunted by cats. This further confirms the stray status of the cats used in this study. Six (6) different genera of both helminthes and protozoan parasites encountered were: in the samples examined namely: *Ancylostoma* spp, *Toxocara cati*, *Gnathostoma spinigerum*, *Toxocara leonina*, *Toxoplasma gondii* and *Dipylidium caninum* are of public health significance. That 21, out of a total of 26 cats, were positive for different parasites, also suggests lack of veterinary medical attention and the stray status of the cats. Abu-Madi et al. [12] reported prevalence rates of 75.8% for *T. taeniaeformis*, 42.8% for *Dipylidium* spp. 17.0% for *A. tubaeforme*, 6.6% for *Physaloptera* spp. and 0.8% for *T. cati* in stray cat populations in Qatar. Compared to results in this study, results for *T. taeniaeformis* and *Dipylidium* spp. and lower for *A. tubaeforme* and *Physaloptera* sp.

For the purpose of this study, stray cats sampled were categorized into two distinct age groups: Juveniles (0-2 years) and adults (2 years and above). Results from this study indicates that adults had a great prevalence of intestinal parasites (100%) than the juveniles (75%) (Table 2). There was no satisfactory significant association. (P=0.1358). This is in agreement with the findings of Abu-Madi et al. [12], who reported higher prevalence of *T. taeniaeformis* and *Dipylidium* spp in adult cats

Parasites	Hospitals A and B
<i>Taenia taeniformis</i>	2 (6.67%)
<i>Aelurostrongylus abstrusus</i>	2 (6.67%)
<i>Ancylostoma tubaeforme</i>	5 (16.67%)
<i>Isospora</i> spp	4 (13.33%)
<i>Toxocara cati</i>	5 (16.67%)
<i>Toxoplasma gondii</i>	4 (13.33%)
<i>Dipylidium caninum</i>	4 (13.33%)
<i>Physaloptera canis</i>	1 (3.33%)
<i>Gnathostoma spinigerum</i>	2 (6.67%)
<i>Toxocara leonina</i>	1 (3.33%)
Total	30 (100%)

Table 1: Parasites identified in the cats from Hospitals A and B (n=30).

compared to the juveniles sampled in this study. This can be attributed to the profound hunting ability of the adult stray cats.

Distribution of intestinal parasites in the stray cats sampled in this study showed that males had a higher prevalence of the parasites (92.8%) than the females (75%). However, this difference in prevalence between males and females is not statistically significant (P=0.3061) (Table 3). The results obtained in this study contradict that of Zibaei et al. [15] in Iran who reported a higher prevalence in the females than the males.

Analysis of the intestinal parasites distribution among the two hospitals studied shows that stray cats in Hospital A had higher prevalence than that of Hospital B. The difference is however not significant statistically (P=0.6348) (Table 4).

These cats constitute health hazards to the patient in particular, as they are found both around the hospital environment as well as within the wards (81%), competing with the patients and their relatives for what to eat. Since many people are not conversant with the public health risks associated with contacts with these cats, they are paradoxically treated as formidable companions, and thus, relished and played with. Despite the remarkable research carried out so far on gastrointestinal parasites of cats in various parts of the country and the world at large, little has been done to investigate and evaluate the prevalence of gastrointestinal parasites of cats in the two hospitals in Sokoto metropolis, Sokoto, Nigeria. The prevalence rates of parasites in stray cats in this study suggest the need to discourage the breeding of stray cats, and to disallow cats gaining access to hospital wards.



Figure 1: Cats in a patient's ward of one of the hospitals.

Age	Number sampled	Positive	Negative	Prevalence
Juveniles	16	12	4	75%
Adults	10	10	0	100%

Fisher's Exact Test: P=0.1358, not significant.

Table 2: Distribution of intestinal parasite in different age groups of stray cats.

Sex	Number sampled	Positive	Negative	Prevalence
Males	14	13	1	92.8%
Females	9	9	3	75%

Fisher's Exact Test: P=0.3061, not significant.

Table 3: Distribution of intestinal parasites in male and female stray cats.

Hospital	Number sampled	Positive	Negative	Prevalence
A	14	12	2	85.7%
B	12	9	3	75%

Fisher's Exact Test: P=0.6348, not significant.

Table 4: Distribution of intestinal parasites of stray cats in the hospitals (A and B).

References

1. Podberscek A, Blacksha J (1988) Reasons for liking and choosing a cat as a pet. *Aust Vet J* 65: 332-333.
2. Beaver BV (1992) *Feline Behaviour: A guide for veterinarians*. WB Saunders Company, Missouri, USA.
3. Omengebe JO (1980) A survey of dogs and their owners seen at two veterinary clinics in the Enugu and Nsukka areas of Anambra State, Nigeria. *Preventive Veterinary Medicine* 27: 89-94.
4. Buijs J (1993) *Toxocara* infection and airway function: An experimental and epidemiological study. Universiteit Utrecht.
5. Beaver PC (1984) *Clinical Parasitology*. (9th Edn), Lea and Fibiger, Philadelphia, USA.
6. Schantz PM (1989) *Toxocara larva migrans* now. *Am J Trop Med Hyg* 41: 21-34.
7. Despommier D (2003) *Toxocariasis: Clinical aspects, epidemiology, medical ecology, and molecular aspects*. *Clin Microbiol Rev* 16: 265-272.
8. Overgaauw PA (1997) Prevalence of intestinal nematodes of dogs and cats in the Netherlands. *Vet Q* 19: 14-17.
9. Dalimi A, Mobedi I (1992) Helminth parasites of carnivores in northern Iran. *Ann Trop Med Parasitol* 86: 395-397.
10. Umeche N, Ima AE (1988) Intestinal helminthic infections of cats in Calabar, Nigeria. *Folia Parasitol (Praha)* 35: 165-168.
11. Sharif M, Nasrolahei M, Ziapour SP, Gholami S, Ziaei H, et al. (2007) *Toxocara cati* infections in stray cats in northern Iran. *J Helminthol* 81: 63-66.
12. Abu-Madi MA, Pal P, Al-Thani A, Lewis JW (2008) Descriptive epidemiology of intestinal helminth parasites from stray cat populations in Qatar. *J Helminthol* 82: 59-68.
13. Yamaguti S (1953) Parasitic worms mainly from Celebes. Part 2. Monogenetic trematodes of fishes. *Acta Medica Okoyama* 8: 203-256.
14. Dryden DM, Saunders LD, Jacobs P, Schopflocher DP, Rowe BH, et al. (2005) Direct health care costs after traumatic spinal cord injury. *J Trauma* 59: 443-449.
15. Zibaei M, Sadjadi SM, Srkari B (2007) Prevalence of *Toxocara cati* and other intestinal helminths in stray cats in Shiraz, Iran. *Trop Biomed* 24: 39-43.

Citation: Raji AA, Magaji AA, Bello MB, Lawal MD, Mamuda A, et al. (2013) Prevalence of Gastrointestinal Parasites of Stray Cats: A Case Study of Two Hospitals in Sokoto Metropolis, Sokoto, Nigeria. *J Bacteriol Parasitol* 4: 175. doi:[10.4172/2155-9597.1000175](https://doi.org/10.4172/2155-9597.1000175)

Submit your next manuscript and get advantages of OMICS Group submissions

Unique features:

- User friendly/feasible website-translation of your paper to 50 world's leading languages
- Audio Version of published paper
- Digital articles to share and explore

Special features:

- 250 Open Access Journals
- 20,000 editorial team
- 21 days rapid review process
- Quality and quick editorial, review and publication processing
- Indexing at PubMed (partial), Scopus, EBSCO, Index Copernicus and Google Scholar etc
- Sharing Option: Social Networking Enabled
- Authors, Reviewers and Editors rewarded with online Scientific Credits
- Better discount for your subsequent articles

Submit your manuscript at: <http://www.omicsonline.org/submission>