PREVALENCE AND PUBLIC HEALTH SIGNIFICANCE OF HELMINTH OVA IN DOMESTIC DOGS IN CALABAR, SOUTHERN NIGERIA

ISSN: 2141 – 3290
www.wojast.com

[1]OKON, O. E., [2]OPARA, K. N., [1]IKPE, U.,
[3]ADEJIMI, A., [4]IBOH, C. I.

[1]Department of Zoology & Environmental Biology, University of Calabar, Calabar, Nigeria
[2]Department of Zoology, University of Uyo, Uyo, Nigeria
[3]Department of Veterinary, Microbiology and Parasitology, University of Ibadan, Nigeria
[4]Department of Biological Sciences, Cross River State University of Technology, Calabar, Nigeria
[2]Author for correspondence

ABSTRACT: Faecal samples collected from 200 domestic dogs (100 local and 100 Alsatians) were processed using formol-ether sedimentation concentration technique and then examined for helminths ova. The result showed the following percentage prevalence among the dogs examined: *Ancylostoma caninum* 86 (43.0%), *Ascaris* species 31 (15.5%), *Diplylidium caninum* 58 (29.0%), *Toxocara canis* 25 (12.5%) and *Trichuris vulpis* 19 (9.5%). The percentage prevalence of the local breeds were as follows. *A. caninum, Ascaris* species, *D. caninum, T. canis* and *T. vulpis* were 59%, 26%, 40%, 21% and 12% respectively. The Alsatian breeds had the following percentage prevalence for the various helminthes: *A. caninum, Ascaris* species, *D. caninum, T. canis* and *T. vulpis* 27%, 5%, 18%, 4% and 7% respectively. The prevalence of the local breeds were consistently higher than the Alsatian breeds although there was no significant difference statistically (P>0.01). Dogs in the Calabar Environment had the tendency to feed indiscriminately in refuse dumps from household activities, market squares, human faeces in areas where there is poor sewage disposal system hence their exposure to helminth infections. There should be concerted effort towards the control of these helminth parasites to prevent possible zoonotic transmission to man and other domestic animals.

INTRODUCTION

The role of dogs as domestic animals and its importance to man can not be over-emphasized. They are mainly kept as pets or watch-dogs in human habitation. Dogs are also often used in hunting expeditions in most rural areas. In the southern region of Nigeria and particularly Calabar where this study was carried out, dog meat is a delicacy and is sold in restaurants. Dogs could be used by the Police and other crime fighting agencies to detect criminals from their hide outs, possibly due to their sensitive olfactory and auditory organs, (Dada, et al 1979).

Like many other domestic animals, dogs are exposed to a number of parasitic infections acquired as a result of their feeding habits, bites of parasitic arthropods and contact with other infected domestic animals. Dogs acquire helminth ova as result as their indiscriminate feeding habits from contaminated soil especially the free-roaming types. They have been incriminated in the transmission of zoonotic diseases such as rabies, larva migrans, echinococosis, toxoplasmosis and myiasis (WHO, 1979; Olufemi and Bobade, 1979; Idowu *et al*., 1977; Edungbola 1982).

Published studies on the endoparasities of dogs in Nigeria are limited to those conducted in the cities of Ibadan and Zaria (Idowu *et al*., 1977, Oduye and Olayemi, 1977, Dada and Belina,

1979, Sowemimo and Asaolu, 2008, Fashuyi, 1981). These is paucity of information on the parasite of dogs in southern Nigeria especially Calabar where dog meat is a cherished delicacy. The aim of this study is to assess prevalence and public health significance of helminth ova of dogs in Calabar, Nigeria. The result well enrich existing baseline data and strengthen the strategy to promote public health education on the possible dangers of strayed dogs and its consequence zoonotic infections.

MATERIALS AND METHOD

Study Area

This study was carried out between (July 2007 - April, 2008) among 200 domestic dogs in Calabar, Nigeria. Calabar the capital of Cross River State, Nigeria is located at latitude 04°58′ N and longitude 08°21′ E along the coastal plains of Nigeria. It is in the rainforest belt located near the Atlantic Ocean with high annual rainfall and high humidity.

Collection and Examination of Faecal samples

Houses were visited in different parts of Calabar city to solicit for the cooperation of dog owners to ensure that fresh faecal samples were collected. The city was zoned into four, each zone was informed of the day of visit by any member(s) of the research team. Information were obtained on the age, sex, breed, degree of restriction and treatment received by each dog in the last one year (Mafiana *et al*., 1993). About 3g of fresh faecal samples were collected into sample bottles with the aid of a spatula. The age, sex and breed of each dog were noted. The freshly collected faecal samples were immediately transported to the laboratory where they were analysed for parasite ova and cysts. The formol-ether sedimentation concentration techniques were used for the analysis of the faecal samples for parasites (Cheesbrough, 2005). Where immediate examination of faecal samples was not possible the collected samples were preserved in 4% formalin. Diagnosis was based on identification of the characteristic helminth ova with a compound microscope using x10 and x40 objectives as described by Cheesbrough (2005).

RESULTS

Studies on the prevalence of Intestinal helminthes among 200 domestic dogs examined between July 2007 and April 2008 revealed the presence of the following parasites: *Ancylostoma caninum* 86 (43.0%), *Ascaris species* 31 (15.5%), *Dipylidium caninum* 58 (29.0%), *Toxocara canis* 25 (12.5%) and *Trichuris vulpis* 19 (9.5%) (Tables 1 and 2).

Prevalence for local breeds of the dogs for *Ancylostoma caninum, Ascaris* species, *Dipylidium caninum, Toxocara canis* and *Trichuris vulpis* were 59%, 26%, 40%, 21% and 12% respectively (Table 2). Moreso, for the Alsatian breeds, the prevalence for *Ancylostoma caninum, Ascaris* species, *Dipylidium caninum, Toxocara canis* and *Trichuris vulpis* were 27%, 5%, 18%, 4% and 7% respectively (Table 2). The prevalence of local breed were consistently higher than the Alsatian breed although there was no significant difference statistically ($P>0.01$).

DISCUSSION

Dogs provide social, economic, security, hunting and meat benefits to man, they have been implicated in the transmission of zoonosis. This study has shown that dogs of different age groups, breeds and sexes haboured various types of helminth parasites. The high prevalence of 69% observed in this study is similar to those recorded elsewhere in Nigeria (Mafiana *et al*., 1993, Anosike, *et al*., 2004). Dogs below the age of 8 months had more infections than the older ones. The plausible explanation could be due to their low resistance and/or due to the possibility of pre-natal infection of the foetus via intrauterine and lactogenic routes (Soulsby, 1982).

Table 1: Age range and percentage prevalence of the helminth ova of domestic dogs in Calabar, Nigeria

			No (%) prevalence of the various helminth parasites				
Age range months	**No of dogs examined**	**(%) Infected**	***Ancylostoma caninum***	***Ascaris species***	***Dipylidium caninum***	***Toxocara canis***	***Trichuris vulpis***
1 – 4	89	(67.4)	43 (48.3)	5 (5.6)	21 (23.6)	17 (19.1)	17 (19.1)
5 – 8	28	(62.2)	17 (37.8)	9 (20.0)	12 (26.7)	4 (8.9)	2 (4.4)
9 – 12	20	(54.1)	8 (11.9)	15 (40.5)	14 (37.8)	1 (2.7)	0 (0.0)
> 12	18	(62.1)	18 (62.1)	2 (6.9)	11 (37.9)	3 (10.4)	0 (0.0)
Total	**138**	**(69.0)**	**86 (43.0)**	**31 (15.5)**	**58 (29.0)**	**25 (12.5)**	**19 (9.5)**

Table 2: Percentage prevalence of the helminth ova in both local and Alsatian dogs examined in Calabar, Nigeria

			No (%) prevalence of the various helminth parasites				
Breed of dogs	**No of dogs examined**	**(%) Infected**	***Ancylostoma caninum***	***Ascaris species***	***Dipylidium caninum***	***Toxocara canis***	***Trichuris vulpis***
Local	86		59 (59.0)	26 (26.0)	40 (40.0)	21 (21.0)	12 (12.0)
Alsatian	52		27 (27.0)	5 (5.0)	18 (18.0)	4 (4.0)	7 (7.0)
Total	**138**	**(69.0)**	**86 (43.0)**	**31 (15.5)**	**58 (29.0)**	**25 (12.5)**	**19 (9.5)**

In addition the younger animals are heavy feeders and a lot more viral than the older animals that are less voracious and active (Anosike *et al*., 2004, Fitzimmons, (1967). The high prevalence of *A. caninum* found in the present study is a public health concern, eggs of Ancylostoma species have been implicated in cutaneous larva migrans in human (Avcioglu and Burgu, 2008). Moreover, the eggs of Ancylostoma spp are extremely resistant to environmental and climatological conditions (Jacob, 1978). It has been reported by Ukoli (1984) that warmth, shade, moisture optimum temperature of 23°C to 30°C and loose humus soil as suitable environmental conditions for the survival of hookworms eggs and larvae. Since these conditions are almost similar to the climatic conditions of the study area, it is possible that the longevity of hookworm eggs and larvae in soil might have been enhancing transmission. Dogs are the chief culprits in spreading human toxocariasis (Visceral larva migrans) because of their indiscriminate defaecatory habits (Ukoli, 1984, Hackett and Fiona (1980).

The rate of infection in the human population depends on the history of pica, the abundance of dogs, personal hygiene and public health, the prevalence of parasites in definitive hosts and the abundance of eggs contaminating the environment (Thompson et al 1986). Public parks can be contaminated by indiscriminate daefecation by dogs. Due to ingesting sand and petting dogs, children are prone to those zoonosis in public parks contaminated with helminth egg (Avcioglu and Borgu, 2008).

The local dogs were significantly more infected than the Alsatian breed. More resistance to infection, regular treatment and better care of the Alsatian breed might have accounted for this observation, Mafiana *et al*. (1993) made similar observations. The importance of controlling feline parasite is not only to relieve clinical symptoms in infected dogs but also to minimize the zoonotic potential of larval nematode infections in human, Adejoka (2005) and Hogan (1983). Helminths infection in dogs should be viewed seriously since this pet animal live in close association with humans. Moreso, in Southern Nigeria especially Calabar dogs are widely consumed as a cherished delicacy. These observations are of special interest to both veterinary and public health workers. Good personal hygiene, adequate environmental sanitation, public health education and treatment of infected dogs are strongly advocated Kamiya et al (1975).

REFERENCES

Adejoke, I. C. (2005). Prevalence of Intestinal Parasites of dogs in Lagos, Nigeria. *Pakistan Journal of Scientific and Industrial Research* 48 (4): 279-283.

Anosike, J. C., Nwoke, B. E., Ukaga, C. N., Madu, N. G. J. and Dozie, I. N. S. (2004). Aspects of intestinal helminth parasites of dogs in World Bank assisted housing estate, New Owerri, Nigeria. *African Journal of Applied Zoology and Environmental Biology* (6): 25-29.

Avcioglu H. and Burgu, A. (2008). Seasonal prevalence of Toxocara ova in soil samples from public parks in Ankara Turkey. *Vector-Borne and Zoonotic Diseases* (8):345-350.

Cheesbrough, M. (2005). *District Laboratory Practice in Tropical Countries*, Second edition, Part 1, Cambridge University Press. Edinburgh, U.K. 454.

Dada, B. J. (1981). Prevalence of Echinococcus granulosus infection in stray Dogs. *Journal of Helminthology*, (54): 249-251.

Dada, B. J. and Blino, E. D. (1979). Prevalence and Public Health significance of Helminth Ova in Dogs in Zaria. *Annals of Tropical Medicine and Parasitology*, (23) 5: 493.

Dada, B. J. Adegboye, D. S. and Mohammed, A. N. (1979). A Survey of Gastro-intestinal helminth parasites of stray dogs in Zaria, Nigeria. The Veterinary Record, (104) 7: 145-146.

Edungbola, L. D. (1982). Cataneous myiasis due to Tiambu-fly, Cordylobia anthropophaga in Ilorin, Kwara State, Nigeria. *Acta Tropica* (39), 355-362.

Fashuyi, S. A. (1981). Helminthiasis in Dogs in Lagos. Bulletin of Animal Health and Production in Africa, (2), 133-134.

Fitzimmons, W. M. (1967). A Survey of Parasites of native Dogs in Southern Malawi with remarks on their Medical and Veterinary importance. Journal of Helminthology 41(1): 15-18.

Hackett, F. and Fiona, M. H. (1980). The Prevalence of Cestodes in Farm Dogs in Mid-Wales. Veterinary Parasitology, (10), 95-101.

Hogan, J. A. (1983). The Intestinal parasites of Dogs in Veterinary Clinic in Calabar. B.Sc. Project submitted to the Department of Zoology, University of Calabar.

Hogan, J. A. (1983). The Intestinal parasites of Dogs in Veterinary Clinic in Calabar. B.Sc. Project submitted to the Department of Zoology, University of Calabar.

Idowu, L. E., Okon, E. D., Dipeolu, O. O. (1977). A three year analysis of parasitic diseases of Dogs and Cats in Ibadan, Nigeria. *Bulletin of Animal Health and Production in Africa*. (25) 2: 165-170.

Jacob, D. E. (1978). Gastro-Intestinal Parasites of Dogs in Great Britain *Journal of Helminthology* (45), 225-227

Kamiya, H. S., Tada, Y. and Kamiya, M. (1975). Helminth of Stray dogs in Saporo II. *Helminthological Abstract* 44(2): 10-15.

Mafiana, C. F. Osakwe, P. N. and Akande, D. (1993). Intestinal Helminths of Dogs in Abeokuta, Nigeria. *Nigerian Journal of Parasitology* 89-93.

Oduye, O. O. and Olayemi, M. F. (1977). An Investigation into some causes of canine diarrhoea in Ibadan. *Journal of Small Animal Practice* (18), 543-546.

Olufemi, B. E. and Bobade, P. A. (1979). Prevalence of gastrointestinal helminth parasites of dogs in Ibadan, *Nigeria Veterinary Journal (*8), 68-70.

Ukoli, F. M. A. (1984) : Introduction to Parasitology in Tropical Africa. John Willey and sons Limited, UK.

Sowemimo, O. A. and Asaolu, S. O. (2008). Epidemiology of Intestinal helminth Parasites of dogs in Ibadan, Nigeria. Nigeria of Helminthology, 82(1) : 89-93.

Soulsby, E. J. L. (1982). Helminth, Arthropods and Protozoa of domesticated animals. The English book Society and Bailliere Tindal, London.

Thompson, D. E., Bundy, D. A. P., Coopes, E. S. and Schantz, P. M. (1986): Epidemiological characteristics of *toxocara canis* zoonotic infection of children in a Caribbean community. Bulletin of World Health Organisation (64), 283 - 290

WHO (1979). Parasitic Zoonosis. Technical report series No. 637. A report of joint FAO/WHO expert committee 107.