



PREVALENCE OF PROTOZOAN OOCYSTS IN DOGS AND CHILDREN OF DOG OWNERS IN ZARIA NIGERIA

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ABSTRACT

This study was carried out to determine the main species of protozoan oocysts of intestinal parasites in faecal samples of dog owners' children, children from homes without dogs (CHWD) and dogs in some selected area in Zaria of Kaduna State Nigeria. This was achieved in collaboration with ethnical clearance from the selected schools. It also determined the prevalence of protozoan oocysts in children of dog owners and children from homes without dogs in Zaria.

Keywords: Protozoan *oocysts*, dogs, pupils, prevalence, Zaria.

INTRODUCTION

Different species of dogs have been in existence in different parts of the world and the domestic dogs, *Canis familiaris* serves man in so many ways such as hunting, sporting tending-flocks, herds, crime detection and prevention, leading blind, source of protein and income as commonly known as pets to families. (Robinson and Pugh 2002; Ademola and Ola-Fadunsin 2012). Developing countries neglect many areas or villages in the provision of good health care, veterinary services and health education due to insufficient data on the prevalence of diseases. Due to this, increase in mobility and mortality rates are recorded mostly in these areas. The investigation of nature revealed places in developing countries in the world such as Africa and mostly in Nigeria. Research findings revealed that private household dogs still have relatively close contact with humans with a serious potential source of direct parasitic transmission with reduced prevalence (Naoyuki *et al.*, 2009). The results from animal studies are crucial for closing the knowledge gaps about health and

diseases in both humans and animals Ademola and Ola-Fadunsin (2012).

MATERIAL AND METHODS

Study Area

The study was carried out in Mile Goma, Ahmadu Bello University-(main campus.) Samaru, Palladan, Zango, and Bassawa, all in Zaria area, Kaduna state. Zaria is located between longitude 7^o 44' east and latitude 11^o6' north of the equator. It's located on plateau at a height of about 670.5m above sea level in the center of northern Nigeria and more than 643.7km from the sea (Duze and Ojo 1990). The population of Zaria, according to 1991 census is 277, 187 people Africa concord 1992). Zaria is about 80km north of Kaduna. It has distinct wet and dry seasons. Temperatures usually highest in March and April, the dry season normally start from November to April.

Study Population

It comprises of different ages and sexes. The age ranged between 2-12 years in both nursery and primary schools were randomly selected from the study and were further grouped into

Table 1: Prevalence of protozoan oocysts in children of dog owners and their dogs in Zaria

	CDO			CHWD ^x			Dog		
	Examined	Positive		Examined	Positive		Examined	Positive	
Parasites Protozoan	No.	No.	%	No.	No.	%	No.	No.	%
<i>Entamoeba</i> species	398	36	9.0	134	2	1.49	398	3	0.75
<i>Isoospora</i> species	398	0	0.0	134	0	0.0	398	15	3.77
Multiple infection	398	6	1.5	134	0	0.0	398	18	4.52
Gender									
Male	194	22	5.5	67	0	0.0	194	10	2.51
Female	204	20	5.0	67	2	1.49	204	26	6.53
Total	398	42	10.5	134	2	1.49	398	36	9.04

t-test for CDO = 0.16; t-test CHWD = 0.14; p<0.05 insignificant difference

CDO: Children of dog owners; CHWD: Children from homes without dog(s)

Table 2: Specific protozoan parasite distribution in relation to age groups of pupils and dogs

CDO		CHWD ^x			Dog					
Age	Examined	Positive (%)		Examined	Positive		Age	Examined	Positive	
Years	No.	No.	%	No.	No.	%	Months	No.	No.	%
1.6-4.5	24	1	0.25	9	0	0.0	0.01-9.5	236	15	3.77
4.6-7.5	132	13	3.3	51	2	1.49	9.6-18.5	127	10	2.51
7.6-10.5	126	19	4.77	45	0	0.0	18.6-27.5	26	7	1.75
10.6-13.5	116	8	2.01	29	0	0.0	27.6-36.5	9	4	1.00
Total	398	42	10.5	134	2	1.49	Total	398	36	9.04

Analysis of variance, CDO F = 0.12, P = 0.13, CHWD, F = 0.14, P = 0.18, Std = 1.3,

Chi F = 0.14, P = 0.18, Std = 1.3 Insignificant relationship

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children of dog owners (CDO) and children from home without dog CHWD by balloting, a total of 930 stool samples, of 398 for children of dog owners and 398 from dogs and 134 of children from homes without dogs (CHWD). Each selected child were issued with labeled bottle for their faecal samples. Schools were visited before sampling to discuss the objectives of the study with school head, teachers and pupils to win their cooperation. Collections of faecal samples were demonstrated to the pupils selected and designated specimen bottles and applicator sticks were also issued for collecting their dogs faeces. Questionnaire which contained biodata of children and dogs were sent to their parents. Faecal samples and questionnaire were collected between 8am-9am and was taken to the laboratory for analysis.

Analysis of Faecal Samples

Stool samples were immediately preserved in 1ml of 10% formalin. Simple flotation method was used for faecal samples of dogs, while formal-ethyl concentration technique was used for faecal sample of pupils.

Statistical Analysis

Prevalence was determined as defined by Margolis *et al.*, (1982), t-test to differentiate the significant difference between male and female and analysis of variance to determine the significance relationship between the ages.

RESULTS AND DISCUSSION

Two prevalence protozoan oocysts parasites of children and dogs in this study were *Entamoeba* spp., and *Isoospora* spp., others are multiple parasites. These parasite have been associated with different debilities, morbidity and mortalities in humans and dogs (Table 1). Protozoan oocysts that were found in children of nursery and primary schools and dogs in

Zaria have been reported in different parts of Nigeria Adebote *et al.*, (2002). George *et al.*, (2003); Kawo *et al.*, (2004) in other part of West Africa (Mpoarme *et al.*, (2003) also, developed countries (Juniper Russo 1999-2011). The higher prevalence of these parasites in stool samples of children of dog owners (CDO) compared with children from homes without dogs (CHWD) may be attributed to improper environmental sanitation, ignorance of the children cuddling of dogs and environmental contamination through indiscriminate defecation by dogs. This reports agrees with Smith *et al.*, (2006), Roddie., (2008), Also, infections in dogs such as pot belly are considered as a public health risk due to zoonotic potential. (Naoyuki *et al.*, 2009).

Entamoeba spp and *Isospora* spp. were the only protozoan parasites found in this study, but *Entamoeba* spp was found in CDO, CHWD and dogs while, *Isospora* spp. was restricted to dogs only. The publication is that, *Entamoeba* spp is cosmopolitan and has been associated with amoeba discentry (Wiser, 2002), fever and diarrhea (Smyth 1996) and abscess (Stanley 1997). Loss of weight *Entamoeba* spp has potential zoonotic with CDO, CHWD and dogs in this study.

Sex related infection in CDO and CHWD shows that the males of CDO are likely to be parasitized than males of CHWD, and a similar observation was also reported for females. Male are slightly higher than female. Children from homes without dogs are negligible indicating that least infected. High prevalence of female dogs may be due to cuddle transmammary, transplacental and through licking the fur and body of puppies, supported by (Naoyutu *et al.*, 2009) a similar pattern in Japan. In Nigeria, it was equally showed that female dogs are highly infected. Also, a zoonotic potential was established between dogs and CDO.

The age group 1.6-4.5 years in CDO and CHWD has the least prevalence of infection,

though much higher in CDO than CHWD (Table 2). The lower prevalence in this group may be due to higher parental care and prevention of these children from wandering far away from home. The higher prevalence in CDO than CHWD may be associated with higher variations in exposure to dogs or parasitic agents. Children in the age group 7.6-10.5 years in CDO and 4.6-7.5 CHWD had higher prevalence (Table 2). This age group is considered to be very exploratory, daring and restless, thus, pointing to the reasons of the high prevalence decreased in the children considerably. Puppies and younger dogs have the highest overall prevalence of parasites in this study. Intimate care offered by lactating bitches has been reported to aid transmission of parasites (Adebote, *et al.*, 2002; George, *et al.*, 2003. Naoyuki, *et al.*, 2009). The protozoa decrease as the age of the puppies increased. Children are more engaged in playing with dogs as pet of home not minding the health implication than adults. Therefore, they are more likely to contact protozoan infections than adults.

Multiple infection by these parasites was observed among school children supported by Obiukwu (2007) Zoonotic potential of protozoan parasites of *Entamoeba* spp. was observed. This could lead to Coccidiosis of human nutrition as well as physical, mental developments and school performance reduction. This support with Stephenson and Hollanby (1987), Adebote, *et al.*, (2002); Shehu, *et al.* (2011).

CONCLUSION

Entamoeba spp. and *Isospora* spp. are prevalent in dogs and children of dog owners in Zaria. Children within the age bracket of 7.6-10.5 years are the most infected group. There was no difference in prevalence between males and females. CHWD were least infected whereas zoonotic potential was established between dogs and CDO. Therefore society needs enlightenment on the zoonotic

potential to improve the level of public health in our society.

Regular education on protozoan infections, washing of hands, and veterinary check-ups of dogs are advocated

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