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Prevalence and Public Health Significance of Gastro-Intestinal Parasites in Human and Dog Faeces Deposited in Public Places in Maiduguri, Nigeria

C. O. Nwosu*, H. Abba and A. Mohammed

Department of Veterinary Microbiology and Parasitology, University of Maiduguri, Maiduguri, Nigeria

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ABSTRACT: Faecal materials of human and canine origin and soil samples from different locations in Maiduguri metropolis were examined for the presence of gastro-intestinal parasites between January and March 1996. A total of 362 human and 64 dog faeces, and 80 soil samples were examined with 156 (43.1%), 24 (37.5%) and 10 (12.5%) of them respectively containing the cysts and/or ova of one or more gastro-intestinal parasite. Ascarid and hookworm ova and Entamoeba cysts were the most common parasites encountered in human faeces and occurred in 50 (13.8%), 38 (9.4%) and 34 (9.4%) of the samples respectively. Other parasites encountered in human faeces were Taenia (6.6%), Trichuris (4.4%), Schistosoma (2.8%), Hymenolepis (2.2%) and Giardia (0.6%) species. Only hookworm and ascarid (Toxocara) ova were encountered in dog faeces (37.5% and 3.1% respectively) and soil samples (5.0% and 10.0% respectively) examined during the period. Although public places in most parts of Maiduguri appeared to be highly contaminated with gastro-intestinal parasites of man and dogs, the contamination was significantly more common ($P < 0.05$) in high density than low density areas of the metropolis. The public health significance of these findings are discussed.

Key words: Gastro-intestinal parasites; Human faeces; Canine faeces; Public Health.

Introduction

The prevalence of gastro-intestinal parasites of man (Obiamiwe, 1977; Oyerinde, 1982; Galadima and Olatunde, 1987; Obiamiwe and Nmorsi, 1991; Fashuyi, 1992) and dogs (Dada *et al.*, 1979; Olufemi and Bobade, 1979; Okolo, 1984; Anene and Onamegbe, 1987) have been studied and reported from several parts of Nigeria. However, only very few reports are available on the situation in Maiduguri, the capital and largest urban centre in Borno State. Maiduguri metropolis is known to be home to a high population of stray dogs (Nwosu *et al.*, 1990). Such stray dogs roam the streets and the surrounding community which, as a result of their indiscriminate defaecating habit, they contaminate with their faeces. People and dogs are often seen defaecating openly in public places within the metropolis.

*To whom correspondence should be addressed

As a result of the close association between them, man and dogs share several gastro-intestinal parasites which are transmissible from one to the other (Dunn, 1978; Chatterjee, 1981; Soulsby, 1982). Such parasites constitute a serious public health risk (Cypriss, 1978; Oyerinde, 1982; Okolo, 1984). This paper describes the prevalence and public health significance of gastro-intestinal parasites of man and dogs present in faecal materials deposited in public places in different parts of Maiduguri metropolis.

Materials and Methods

Fresh faecal samples of human and canine origin and soil samples were collected from public places in different parts of Maiduguri metropolis. The city was divided into 9 wards made up of 7 with high and 2 with low density population. In all, a total of 362 human and 64 dog faeces and 80 soil samples were collected from the various wards between 7 and 9 o'clock daily from January to March 1996.

Each sample was respectively examined for gastro-intestinal parasites by the direct faecal smear, and flotation techniques using saturated sodium chloride solution and by the formol-ether sedimentation method (Chatterjee, 1981). In all cases, helminth ova and protozoan cysts present were identified using standard parasitological methods (Dunn, 1978; Chatterjee, 1981; Soulsby, 1982). Results were analysed at the 5 percent level of significance (Compell, 1986).

Results

Out of a grand total of 506 samples examined during the period, 190 (37.5%) contained one or more gastro-intestinal parasites of man and dog. Among the 362 human and 64 dog faeces and 80 soil samples, 156 (43.1%), 24 (37.5%) and 10 (12.5%) respectively contained one or more gastro-intestinal parasites.

Among the various parasites encountered in human faeces, *Ascaris* followed respectively by hookworm ova and *Entamoeba* cysts were more common than other parasites (Table 1). Only ascarid (*Toxocara*) and hookworm ova were encountered in dog faeces and soil samples examined during the same period.

The rest of the results are shown in Table 1.

In general, gastro-intestinal parasites were significantly more common ($P < 0.05$) in human and dog faeces and soil samples examined in areas of the metropolis with high density population than those with low density population (Table 2).

Table 1: Gastro-intestinal parasites encountered in the 362 human and 64 canine faeces and 80 soil samples examined at different locations in Maiduguri, Nigeria.

	Number positive (and percentage)			
	Human	Canine	Soil	All samples
Ascarid ova	50 (13.8)	2 (13.8)	8 (10.0)	60 (11.9)
Hookworm ova	38 (10.5)	24 (37.5)	4 (5.0)	66 (13.0)
Trichuris ova	16 (4.4)	0	0	16 (3.20)
Taenia ova	24 (6.6)	0	0	24 (4.7)
Hymenolepis ova	8 (2.2)	0	0	8 (1.6)
Schistosoma ova	10 (2.8)	0	0	10 (2.0)
Entamoeba cysts	34 (9.4)	0	0	34 (6.7)
Giardia cyst	2 (0.6)	0	0	2 (0.4)
Mixed infections	22 (6.1)	2 (3.1)	2 (2.5)	26 (5.1)

Table 2: Prevalence of gastro-intestinal parasites according to density of population in Maiduguri, Nigeria.

	High density areas			Low density areas			All Samples
	Human	Canine	Soil	Human	Canine	Soil	
No. Examined	256	44	60	106	20	20	506
No. Positive	134	22	10	22	2	0	190
% Positive	52.3	50.0	16.7	20.8	10.0	0	37.5

Discussion

Many of the parasites encountered during this study have been reported previously either in man or dogs (Anene and Omamegbe, 1987; Galadima and Olatunde, 1987). However, this study confirms previous reports that ascarid and hookworm species are the most important gastro-intestinal parasites of man and dogs in most geographical regions of Nigeria. However, in the present study, they were encountered in relatively lower prevalences probably as a result of the differences in climatic conditions between Maiduguri and the other study areas. Moreover, this study was conducted during the dry season when, according to Nwosu *et al.*, (1990), unfavourable conditions for the development, survival and translocation of preparasitic stages of gastro-intestinal parasites pertain in the environment.

All the parasites encountered in human faeces during this study are easily transmissible to other people. This is especially more common in children in whom these parasites are more pathogenic (Cook, 1986; Crompton, 1986). Infection of children and adults with these parasites is contaminative and occurs when infective stages are ingested with food or water. The cultural setting in Maiduguri allows majority of the children to move about unattended and coupled with the poor personal and environmental hygiene, they are easily exposed to infection with these parasites.

In Maiduguri, public conveniences do not exist at strategic locations and when they do people are reluctant to use them because of their unhygienic nature. As a result, many people, adult and children alike, frequently defaecate in public places. Such places, therefore, become sources of disease agents and thus serious public health risks to the rest of the populace.

As a result of the prevailing social problems in Nigeria, dog ownership has increased in many parts of the country (Okolo, 1986; Anene and Omamegbe, 1987). However, because of the economic situations in the country, most of the dogs are allowed to roam the streets and adjoining community in search of food and sexual partners. This situation is very common in Maiduguri (Nwosu *et al.*, 1990) and much more common around the densely populated areas of the metropolis. This may be responsible for the higher prevalence of infection recorded in such areas in contrast to the situation in the low density areas, whose residents are educated and or rich and thus able to keep and feed their dogs in-doors while providing the necessary veterinary and other attention for them.

In the present study, ascarid (*Toxocara* and hookworm (*Ancylostoma*) species were the most common parasites encountered in dog faeces and soil samples. These parasites are also known to infect man leading to various clinical conditions such as ocular, visceral and cutaneous larva migrans (Cypress, 1978; Chatterjee, 1981; Soulsby, 1982). Infection of man with gastro-intestinal parasites of dogs usually occurs as a result of accidental exposures. Such exposures are frequently associated with ignorance, poor personal and environmental hygiene and intimate relationship between man and dogs (Okolo, 1984; Nwosu *et al.*, 1990). Therefore, there is need for public education on the control of dog populations, provision of adequate veterinary and other attention for dogs as well as on the public health risks associated with exposure of man to parasites of dogs.

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