

Prevalence of Intestinal Helminth Infections among School Children in Relation to Occupation of Parents and Toilets Facilities in Maru L. G. A. Zamfara State.

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ABSTRACT

The Study was conducted to study the prevalence of soil transmitted helminth parasites among school age children in Maru L. G. A. Zamfara State. A total 600 hundred school children between the ages of 4- 14 years were examined for Intestinal helminth infections using formol ether concentration technique. A total of 152 (25.33%) were found to be infected with various species of intestinal helminth parasites. The study showed five common intestinal worms in the area. *Ascaris lumbricoides* has the highest prevalence of 32.23% followed by *Enterobius vermicularis* (21.05%), *Trichuris trichuira* (20.39%), Hook worm (13.81%) and *Taenia* spp (12.50%). Mixed Infections (29.60%) with some species of parasites were also encountered. The studies shows a significant difference between infection and the occupation of parents ($P < 0.05$). The study also showed that there was a significant relationship between infection and the type of toilet facilities used ($P < 0.05$). Data suggested that soil transmitted helminths are important public health problems hence actions is imperative against deficiencies in sanitary facilities, improper disposal of human faeces, insufficient supplies of potable water, poor personal hygiene and health education.

INTRODUCTION

Intestinal parasitic infection is one of the major health problems in developing countries. It has been estimated to affect some 3.5 billion people globally and 450 million are thought to be ill as a result of such infections, the majority being children (WHO, 2000).

Infection by soil transmitted helminths has been increasingly recognized as an important public health concern, particularly in developing countries. Due to this significance, there have been regular endeavours to determine and present figures for soil transmitted helminth (STH) infections in Nigeria (Nock *et al.*, 2003). Worm transmission is enhanced by poor socio economic conditions, deficiencies in sanitary facilities, improper disposal of human faeces, insufficient supplies of potable water, poor personal hygiene, substandard housing and lack of education (WHO, 1996).

Thus, this study was undertaken to identify, assess, evaluate the prevalence and epidemiologic factors relating to intestinal helminthiasis and suggest ways by which the level of infection can be reduced in Maru L. G. A. Zamfara State

MATERIALS AND METHODS

Study Area

The study was carried out in Maru L. G. A. it is situated between longitude 6^o24'E and latitude 12^o20'N. It lies on the North West of Nigeria with a total land area of 6,654 square kilometer, it comprises six districts, each has some satellite villages in form of disperse settlements (Mamman *et al.*, 2000). Maru Local Government Area has an estimated population of 293,141 people (NPC, 2006).The research was conducted between the month of August and December, 2010.

Stool Sample Collection

Stool samples were collected randomly from 600 school age children between the months of August and December, 2010. A total of 100 samples were collected from each district of the L G A, Questionnaires were administered to each child from whom the samples were collected. Clean specimen (universal) bottles with tight

covers were given to the children for stool collection each bottle was labeled to correspond with the number of the questionnaires given to them.

Stool Analysis

In order to concentrate the parasites in the faeces, formol-ether concentration technique was employed. Using a stick, about 1g of the faeces mixed with physiological saline was put in a screw-cap bottle containing 4ml of 10 % formol water. The bottle was capped and mixed by shaking for about 20 seconds. Thereafter, the faeces were sieved, and the sieve suspension collected in a beaker. The suspension was transferred to a tube and 3 ml of ether was added. The tube was stopped and mixed by shaking for one minute. Thereafter, the stopper was removed and centrifuged immediately at 3000 rpm for one minute. After centrifuging, four layers were evident; the top layer of ether, thin layer of debris, formalin, and sediment in bottom with parasites. An applicator stick was used to loosen the layer of faecal debris from the side of the tube. The ether, debris and formalin were then carefully poured off. The sediment was mixed, transferred to a slide and covered with a cover glass. The slide was examined under the microscope using first, the 10x objective followed by 40x objective to identify the eggs (Cheesbrough M, 1998). The number of pupils infected with intestinal helminths, and the type of intestinal helminths observed were recorded.

Data Analysis:

Differences in the prevalence of infection between ages and sexes were determined using the χ^2 tests from the contingency tables.

RESULTS:

Prevalence of Intestinal Helminth Infections among School Children:

A total of five species of intestinal helminth parasites were encountered during the study, *Ascaris lumbricoides* had the highest percentage of 49 (32.23%), followed by *Enterobius vermicularis* having 32 (21.05%), *T. trichuira* had 31 (20.39%), Hook worm had 21 (13.81%) and *Taenia species* recording the least percentage of 19 (12.50%), Mixed infection with varying species of intestinal helminth parasites were also recorded having 45 (29.60%) From Table 1, it can be seen that *A. lumbricoides* had the highest prevalence (32.23 %) while *Taenia specie* had the lowest (12.50 %).

Table 1: Prevalence of intestinal helminth infections Among districts

Districts	Total	<i>A. lumbricoides</i>		<i>E. vermicularis</i>		Hookworm		<i>T. trichuira</i>		<i>Taenia spp</i>		Mixed infection	
		M (%)	F (%)	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)
Bingi	26	6(40.00)	2(13.33)	2(13.33)	4(36.36)	2(13.33)	0(0.00)	3(20.00)	4(36.36)	2(13.33)	1(9.09)	5(33.33)	3(27.27)
Dansadau	30	8(38.09)	3(33.33)	4(19.04)	2(22.22)	4(19.04)	1(4.76)	2(9.52)	2(22.22)	3(14.28)	1(4.76)	1(4.76)	1(11.11)
Kanoma	25	7(43.75)	2(22.22)	3(18.75)	3(33.33)	2(12.05)	2(22.22)	3(18.75)	2(22.22)	1(6.25)	0(0.00)	2(12.50)	4(44.44)
Maru	30	8(50.00)	3(21.42)	3(18.75)	2(14.28)	1(6.25)	3(21.42)	4(25.00)	2(14.28)	0(0.00)	4(28.57)	8(50.00)	5(35.71)
Mayanchi	14	2(18.18)	1(33.33)	3(27.27)	0(0.00)	3(27.27)	0(0.00)	1(9.09)	1(33.33)	2(18.18)	1(33.33)	4(36.36)	2(66.66)
R/Doruwa	27	5(27.77)	2(22.22)	4(22.22)	2(22.22)	2(11.11)	1(11.11)	4(22.22)	3(33.33)	3(16.66)	1(11.11)	5(27.27)	3(33.33)
Total	152	36(37.11)	13(23.63)	19(19.58)	13(23.63)	14(14.43)	7(12.72)	17(17.52)	14(25.45)	11(11.34)	8(14.45)	25(25.77)	20(36.36)

Prevalence of intestinal helminth infections in relation to occupation of parents

Children whose parents were farmers had the highest prevalence of 49.34%, followed by children whose parents were businessmen (28.28%), children of civil servants (11.84%) and Children whose parents engaged in public services had the least prevalence of (10.52%). The results show a highly significant difference (P < 0.05) between Infection and occupation of parents.

Table 4: Prevalence of intestinal helminth parasites Infection in relation to occupation of parents

($\chi^2=23.995$, $df=3$, $p\leq 0.05$)

Prevalence of intestinal helminth infections in relation to toilets facilities

Children who used pit latrines had the highest prevalence of 67.76%, followed by children who used open field having 30.26% prevalence, while children that used water closet recorded the least prevalence of 1.52%. The result showed a significant difference ($P < 0.05$) between Infection and nature of toilets facilities used. The result of this study is summarized in Table 3

Table 3: Prevalence of intestinal helminth parasites Infection in relation to toilets facilities

Districts	No. Examined	Water closet (%)	Pit latrine (%)	Nearby bushes (%)	Total
Bingi	100	0(0.0)	12(46.15)	14(53.84)	26
Dansadau	100	0(0.0)	25 (83.33)	5(16.66)	30
Kanoma	100	0(0.0)	15(60.00)	10 (40.00)	25
Maru	100	3(0.0)	24(80.00)	3(10.00)	30
Mayanchi	100	0(0.0)	8(57.14)	6(42.85)	14
R/Doruwa	100	0(0.0)	19(70.37)	8(29.62)	27
Total	600	3(1.52)	103(67.76)	46(30.26)	152

($\chi^2=28.412$, $df=3$, $p\leq 0.05$)

Discussion

Prevalence of Intestinal Helminth Infections among School Children:

The overall prevalence of this studies showed that *Ascaris lumbricoides* (32.23 %), *Enterobius vermicularis* (21.05%), *Trichuris trichiura* (20.05%), hookworm (13.81%) and *Taenia spp* (12.50%) infections, among school children in Maru Local Government Area, Zamfara State. *A. lumbricoides* had the highest prevalence. The higher prevalence of *A. lumbricoides* infection than that of hookworm and *T. trichiura* infection is consistent with the reports of Taiwo and Agbolade (2000) and Adeyeba and Akinlabi (2002), but disagrees with that of Nwaorgu *et al.* (1998). The high prevalence of *A. lumbricoides* infection may be attributed to high level of unhygienic practices among the pupils which enhanced transmission. The presence of *T. trichiura* infections in the study area was not unexpected since it is known that similar conditions which influence the endemicity of *A. lumbricoides* also influence its endemicity (O'Larcain and Holland, 2000). It is also known that *A. lumbricoides* infections are rarely found alone in human communities (Crompton, 1994). The occurrence of intestinal helminth infections in the area was not unusual because the area is a rural area. Parasitic diseases are known to be common in rural areas because of poverty, ignorance and low sanitary conditions (Ukoli, 1992).

Occupation of parents and Prevalence of Intestinal Helminths Infections among School Children:

This study showed that the nature of the occupation of parents influenced infection. Children whose parents were farmers recorded high prevalence of infection and this was similarly observed by Adeyeba and Tijani (2002). This can be attributed to the fact that these children were always in contact with the faecally contaminated soil that served as manure on their farm when assisting their parents with the farm works. Taiwo and Agbolade (2000) observed that they also carried night soils which may contain infective helminth eggs to their farm and spread such soil with their hands, after which they do not normally wash them (their contaminated hand) before eating and in the process they become infected with one species or the other of intestinal helminth parasites. However these studies disagree to the one carried out by Akogun and Badaki (1998) among two communities

along the Benue river valley (Adamawa State) where children of civil servant recorded the higher prevalence of infection.

Toilets facilities Used and Prevalence of Intestinal Helminths Infections among School Children:

The relatively higher prevalence of infection recorded among pupils that used pit latrines (67.76%) compare to those that use open field (30.26%) and water closet (1.52%) may be attributed to the improper usage, poor quality hygiene of the toilet and unacceptably higher numbers of persons per toilet (overcrowding). The high prevalence among those pupils using pit latrine was not surprising since it was known that while the use of pit latrine protect against intestinal helminthes, it must be provided alongside with adequate water supply to ensure personal cleanliness and cleanliness of the latrine. But where the provision of the latrine is not accompanied with adequate supply of water the chances of faecal contamination become higher (Tshikuka *et al.*, 1995). This observation is in line with that of Ali *et al.* (1999).

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