The Prevalence And Socio-Economic Factors Of Intestinal Helminth Infections Among Primary School Pupils In Ozubulu, Anambra State, Nigeria

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Citation

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Abstract

260 stool samples were randomly collected from pupils in four primary schools in Ozubulu, Anambra State. The samples were collected from pupils of both sexes whose ages ranged from 5-16 years old. Using formol- ether concentration method, the stool samples were processed. Questionnaires were also distributed to check for relationship between infection and occupation. 125 (48.08%) were positive for various intestinal helminthes with hookworm accounting for 66 (25.38%), Ascaris lumbricoides 40 (15.38%) Trichuris trichura 15 (5.77%), and mixed infections of Ascaris and hookworm 4 (1.54%). Females had the highest prevalence rate of 76 (55.47%) compared to the males with the rate of 49 (39.84%) which was statistically significant (P<0.05). Among the four primary schools examined, Nza Central School had the highest infection rate of 45 (69.23%) and the least infection 22(33.85%) was found in Amakwa Central School, and was statistically significant (P<0.05). The infection was detected in all the age groups examined, with the 11-13 years age group recording the highest infection rate of 77(85.77%). The infection occurred most in pupils whose parents were farmers 73 (59.84%). This has shown an index of the prevailing unhygienic environment, poor personal hygiene and poverty so there is an urgent need for mass deworming in all the public primary schools examined

INTRODUCTION

Helminth infections are the most common and infective agents of mankind and are responsible for morbidity and mortality throughout the developing world. The infection was ranked highest in morbidity rate among school aged children who often present with much heavy worm infections because of their vulnerability to nutritional deficiency (Bethony et al, 2006). Ova of helminths can also be isolated on the underneath of fingernails of these children (Dyek, 2001) and on the surface of the Nigerian currency notes which they handle and also leak (Ekejindu et al, 2005).These infections are of major public health concerns because factors that predispose man to the infections are bound in the sub-region which include poor environmental hygiene, poverty, malnutrition and ignorance (Ijagbone and Olagunju, 2006)

In many developing countries, the only education children receive is primary school and this is the age when they are more severely infected by helminthes and may thwart the efforts of a country to provide basic school education especially in Nigeria where 70% of school-aged children are enrolled in primary schools (Ola and Oyeledun, 1999). These infections are widespread in Africa with high prevalence rate in Nigeria, Ivory Coast, Angola, New Guinea, Rhodesia and Kenya (Muniz, 2008). Anosike et al,2008 recorded that in a world of 2,200 billion inhabitants, there existed over 2,000 million helminth infections with about 1.5 million Nigerians suffering from Ascariasis alone while there are several thousand with Strongyloidiasis, Trichuriasis, Enterobiasis and hookworm infections. A study of 286 randomly selected children aged 1-18 years in rural Guinea showed that 53% of children were infected by at least one type of soil-transmitted nematode (Glickman et al, 1999). In Nigeria, 68.2% prevalence rate of intestinal helminthes from stool samples of children aged 0-17 years was reported from Ibadan (Dada-Adegbola et al 2005).

The main objective of this investigation is to determine the prevalence and relationship of parent's occupation with helminthes infections in Ozubulu Town, Ekwusigo Local Government Area of Anambra State, Nigeria.

MATERIALS AND METHODS

Study Area: Ozubulu is a rural community situated about 25km East of Onitsha made up of four villages. The natural vegetation is mainly tropical rain forest and the inhabitants are mostly farmers. There are also traders and civil servants in the area. The streams closer to some of the primary schools were used as sources of drinking water, domestic activities and as refuse dumps. There are ten public schools in Ozubulu. Four out of the ten schools were randomly selected for the study.

Distribution of questionnaires: A simple primary school based questionnaire was distributed to the pupils to determine the name, age, sex, socio-economic background, and sanitation situation in their schools and homes.

Collection and examination of faecal samples: Wide mouthed transparent containers were given to 260 randomly selected pupils in the selected schools. The pupils were asked to take the containers home and return same the next morning to school with fresh voided stool samples. The name, age and sex of each pupil were noted after the samples have been collected and labeled. The samples were then transported to the laboratory for analysis using the formol ether concentration technique (Cheesbrough, 2000) as follows;

Formol Ether Concentration Technique: With an applicator stick, 1g of the stool sample was emulsified in 4ml of 10% formol ether contained in a tube. Additional 4ml of 10ml formol ether was added to the added to the tube and homogenized. The emulsified faeces was sieved and collected in a tube. The suspension was transferred to a centrifuge tube into which 4ml of diethyl ether was added. The tube was stoppered and mixed for 1minute. The stopper was loosened and the tube centrifuged at 1000g for 1 minute. After centrifuging, the faecal debris was loosened and decanted along with the ether and formol water leaving the sediment at the bottom of the tube. The bottom of the tube was then tapped to re-suspend and mix the sediment. The sediment was placed on the slide, covered with cover slip and examined microscopically (Cheesbrough, 2000).

RESULTS

Out of the 260 stool samples examined, 125 (48.08%) were positive for various intestinal helminth parasites and some pupils haboured mixed infections. This is distributed as follows; eggs of hookworm 66(25.38%), eggs of Ascaris 40(15.38%), eggs of Trichuris trichuria 15(5.77%) and mixed infection of Ascaris and hookworm 4(1.54%). The distribution according to schools is shown in Table 1.

Figure 1

Table 1:FREQUENCY OF INTESTINAL HELMINTHS FOUND IN THE PRIMARY SCHOOLS EXAMINED IN OZUBULU.

INTESTINAL HELMINTH FOUND	FREQUENCY	NO OF POSITIVE (%)
Hookworm	260	66 (25.38%)
Ascaris lumbricoides	260	40 (15.38%)
Trichuris trichiura	260	15 (5.77%)
Mixed infection (*Ascaris* and Hookworm)	260	4 (1.54%)
Total		125 (48.08%)

Figure 2

Table 2: THE DISTRIBUTION OF MALES AND FEMALES IN THE PRIMARY SCHOOLS EXAMINED IN OZUBULU.

PRIMARY SCHOOLS EXAMINED	MALES		FEMALES		TOTAL	
	No. Examined	No Positive	No. Examined	No. Positive	No. Examined	No. Positive (%)
Nza Central School	29	17	36	28	65	45 (69.25)
Egbema Community Primary School	34	10	31	20	65	30 (46.15)
Eziora Central School	40	13	25	15	65	28 (43.08)
Amakwa Central School	20	9	45	13	65	22 (33.85)
TOTAL	**123**	**49**	**137**	**76**	**260**	**125 (48.08)**

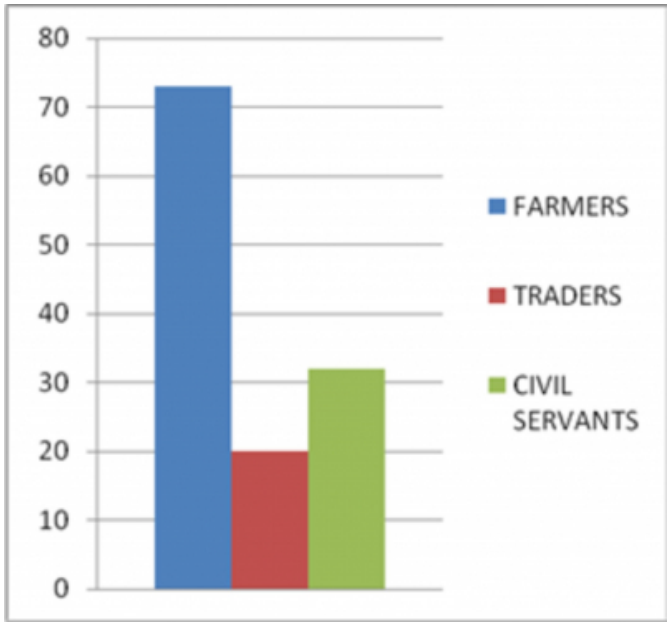
Figure 3

TABLE 3: DISTRIBUTION OF INTESTINAL HELMINTH INFECTIONS IN RELATION TO THE PUPILS' AGE GROUP IN PRIMARY SCHOOLS EXAMINED IN OZUBULU.

PUPILS' AGE GROUP	No. of pupils in school	Total No. examined	No. of Hookworm (%)	No. of *Ascaris lumbricoides* (%)	No. of *Trichuris trichiura* (%)	Mixed infection (*Ascaris* and hookworm) (%)	Total No. (%) infected
5 – 7	304	26	0 (0.00)	2 (7.69)	1 (3.85)	0 (0.00)	3 (11.54)
8 – 10	278	83	16 (19.28)	9 (10.84)	9 (10.84)	1 (1.20)	35 (42.17)
11 – 13	215	131	42 (32.06)	5 (3.82)	5 (3.82)	2 (1.53)	77 (58.77)
14 – 16	194	20	8 (40.00)	0 (0.00)	0 (0.00)	1 (5.00)	10 (50.00)
Total	**991**	**260**					**125 (48.08)**

Figure 4

Fig 1: DISTRIBUTION OF INTESTINAL HELMINTH INFECTIONS BASED ON PUPILS PARENTS' OCCUPATION IN THE PRIMARY SCHOOLS EXAMINED.



The prevalence of helminth eggs with respect to schools were; Nza central School 45(69.23%), Egbema Community Primary School 30(46.15%), Eziora Central School 28(43.08%) and Amakwa Central School 22(33.85%) Prevalence of the infection is higher in females (55.47%) than in males (39.84%). Mixed infections were also observed, Table 2.

Table 3 shows that the prevalence rate of helminth parasites were higher among the 11-13 years age group 77(58.77%) with hookworm having the highest rate 42(32.06%) followed by Ascaris 28(21.37%). Age group 5-7 years had the prevalence rate of 11.54%.

Fig 1 shows the distribution of intestinal helminth infections based on pupils' parents' occupation in the primary schools examined. Pupils whose parents' are farmers had the prevalence of 73(59.84%), traders 20(46.51%) and civil servants 32(33.68%).

DISCUSSION

The results of this investigation revealed a 48.08% helminth content from the study group and this comprised of eggs of Ascaris, Hookworm, and Trichuris. This may illustrate the general trend of the problem among school pupils throughout the country since the same environmental conditions abound everywhere.

Similar observations have been made from other parts of Nigeria (Adeyeba and Akinladi, 2002). Ozubulu is still a virgin area and no study on helminth infection has been done in this area. The pupils are hardly been dewormed thus attributing to the high prevalence of helminth eggs in the stool samples. The environment of this community and the socio-cultural habits of the people could be responsible for the high prevalence of intestinal helminth infections in this area. The highest infection was recorded in Nza Central School because there was no toilet facility in school premises and the pupils defaecate indiscriminately in the nearby bushes and around the school compound. Some of the pupils had mixed infection of Ascaris and Hookworm. This corresponds to the work of Akogun and Badaki (1998) who reported that mixed infections appear to be the norm in many Nigerian parasite communities.

The finding that Hookworm has the highest prevalence rate is similar to what was reported by Aisen et al, (2002). This may be due to the unhygienic habit of wearing barefoot to school and farmlands. This is consistent with earlier reports that intestinal helminthiasis caused by hookworms and roundworms are common diseases especially among rural populations in Nigeria (Chukwuma et al, 2009). The high incidence of the infection among the females is attributed to the variations in the frequency and intensity of occupational exposures to the contaminated environment in this area. The females also assist their parents in farm work and carry out domestic chores in the house and at the stream than the males. The difference in infection rate and sexes was significant ($P<0.05$). This is in accordance with the report of Ndamukong et al,(2000) and Chukwuma et al,(2009) who reported a very high incidence rate in females (91.6%) than in males (83%).

The prevalence of hookworm and Ascaris increased with increase in age. Dada-Adegbola et al (2005) supported this finding and reported a prevalence of 81.6%, 63.3% and 52.4% among children aged 12-17 years, 6-11 years and 0-5 years respectively. This age group walks and assist in the farm barefooted and eat foods and snacks wrapped with ordinary papers from doubtful source and also not washing their hands properly before eating and after playing in the school and working in the farms.

There is a high prevalence among pupils whose parents' occupation are farming. These children follow their parents

to the farmland. This trend was also reported by Akogun and Badaki (1998).

The finding of this study supports the need for mass chemotherapy and community education and awareness in Ozubulu. This would reduce the worm burden, reduce contamination of the environment by these pupils and enable them perform better in schools. It is also necessary that public health promotion be stepped up. Parents and teachers should serve as role models and mentors so as to reduce helminth infection in particular and promote health in general.

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