

URINARY SCHISTOSOMIASIS AMONG SCHOOL CHILDREN IN ESIE COMMUNITY KWARA STATE NIGERIA.

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ABSTRACT

A total of 624 randomly selected primary school pupils in Esie, Kwara state Nigeria were examined to determine the prevalence and intensity of urinary schistosomiasis in the village. A moderately high prevalence of 30.6% was recorded. Infection rate was significantly higher among males (38.5%) than females (21.7%) ($p < 0.05$); reaching the peak in the 11-14 year age group in both sexes. Intensity of infection was higher among males than females in all age groups ($p < 0.05$) with disproportionately high egg output among few infected children. High rate of haematuria (84.8%) was recorded among infected individuals. Prevalence and intensity of infection was higher among pupils of the public (ZEB) schools than among pupils of the private nursery schools. ($P < 0.05$). Malacological study along surrounding streams and river confirmed *Bulinus (physopsis) globosus* as the intermediate host.

INTRODUCTION

Schistosomiasis is one of the most widespread parasitic diseases that put about 400-600 million people world wide at risk, while 200 million are already infected (1). In Nigeria, review of literature (2) revealed wide distribution of the disease with numerous endemic foci particularly in rural riverine areas where infection rate as high as 90% have been recorded. Recent studies (3-5) indicate that the disease may be increasing in prevalence and importance particularly in the remote poorly accessible rural communities. It is against this background that this study was carried out to determine the prevalence and intensity of *Schistosoma haematobium* infection among school children in Esie.

Apart from hospital records which are not comprehensive, there is no documented report of any study on schistosomiasis in Esie. School aged children were chosen for the study because of the general consensus that they are most representative of a community and least prone to migration (6-8).

MATERIALS AND METHODS

The study area

Esie is a rural community located 53km south east of Ilorin Kwara State, Nigeria (Fig.1). It is a typical guinea savannah community with a population of 10,000 people comprising old farmers and young children, The first National Museum (Esie

STONE IMAGES) is sited in this village thus making it an important tourist center with access road and basic infrastructure. The village is well drained by the perennial Osin river as well as Endu and Osuolo streams which together almost encircle the village (Fig. 1). These river and streams serve as supplement to pipe borne water supply from nearby small dam about 2.5km south west of the town.

Data collection.

A preliminary study was conducted during the rainy season in June, while the main study was carried out in the dry months of November to February. Prior to survey, permission was sought from the headmaster, thereafter the children were informed on the importance of the investigation. Pupils from all the four primary schools in the village, comprising two boarding nursery/primary schools and two public (ZEB) schools were parasitologically examined for the study. Terminal urine samples were collected from each pupil in well labeled clean vials between 12.00-2.00pm each day. With the assistance of teachers, questionnaires were administered to obtain information such as name, sex, parental occupation, religion, water contact behaviour and history of haematuria from the pupils. The urine samples were promptly transported to the laboratory where 5ml of thoroughly mixed urine from each sample was taken and centrifuged at 2,000 rpm for 3 minutes. The supernatant was discarded while the thoroughly mixed sediment was examined for eggs of *S. haematobium*.

Malacological study

All the freshwater bodies in the study area were sampled for the study. Pre-survey formalities were undertaken on each of the water bodies to determine sites

for data collection. A total of seven sites (A-F Fig. 1) were selected for snail sampling. Snail sampling was carried out with the aid of steel net shovel. Manual search for snail from various objects was carried out with the aid of forceps where applicable. Sampling was done for about 30 minutes. All snails recovered were placed in a container and transferred to the laboratory at the end of the study. The physico-chemical properties of the water bodies were not studied.

Pattern of man-water contact was studied by visit to the site in the morning and evening.

RESULTS

Of the 624 pupils examined, 191 (30.6%) comprising of 124 (38.5%) males and 64 (21.8%) females were excreting ova of *S. haematobium* in their urine. There was significant difference ($p < 0.05$) in prevalence between sexes (Table 1). The prevalence of infection shows a peak among the 11 - 14 age group, more males than females were infected in all the age groups. The prevalence in the school ranged between 10.1%-36.5% with the highest among pupils of the public schools (Table 2). Deviation for the central tendency in mean egg count was high in all age groups with overall mean egg count of 15.5 ± 27.9 egg/5ml urine (Table 1). More than 60% of the effected pupils excreted ≤ 10 eggs/5ml urine (Fig. 2). Mean egg count was significantly higher among males (19.2 ± 32.9) than females (8.0 ± 10.6). ($p < 0.05$). Prevalence as well as intensity was higher among pupils of the public schools than among pupils of the private nursery/primary schools ($p > 0.05$).

No significant relationship was observed in the frequency of infection in relation to parental occupation and religion

($p < 0.05$). Numerous infected snails of the *Bulinus physopsis globosus* spp were recovered from a site (B) with high frequency of man-water contact (Fig 1). No snail was found in Endu and Osuolo streams (Table 3). Human activities, mainly washing, swimming and collection of water was high at sites A and B particularly in the late afternoon 14.00-18.00 hours. Indiscriminate defeacation was also observed around sites A and B (Fig.1).

DISCUSSION

The result of this study indicates that urinary schistosomiasis is common among school children in Esie community. Though the prevalence figure (30.6%) obtained in this study is similar to those obtained in other villages in Kwara State (9, 10) the prevalence of urinary schistosomiasis in Esie is rather high in view of the available basic infrastructures such as University of Ilorin Comprehensive Health Centre located in the community.

The high prevalence among the school children could be due to prevailing local factors which favour transmission. These include proximity of water bodies containing infected snail intermediate host to schools and homes; high rate of exposure of the children particularly males to these cercaria infested water bodies and lack of health education with particular reference to schistosomiasis. The higher intensity and infection rates among males than females can be attributed to difference in local social habit in relation to sex. Cardinal among these is the higher tendency among males to swim, play and engage in other activities in the rivers and streams besides the primary domestic activity of washing and collection of water which exposes both sexes to infection. The significant difference in prevalence between the pupils of the public and private

schools could be due to the proximity of the public schools particularly St. Micheal (ZEB) Primary School to the cercariae infested water around site B (Fig.1). In addition, the less restraint on the movement of pupils of the public schools compared with pupils of the private schools allows for more water contact and consequently increase in prevalence among the pupils of the public schools.

Age specific prevalence results in Table 1 shows that infection rate increased with age, reaching the peak among the 11-14 years age group and subsequently dropped with advancing age.

The findings in this study that most infected individuals excreted few eggs (<10 eggs/5ml urine) and that a very small proportion excreted many eggs agree with the observations that a few individuals in an endemic community carry a disproportionately high share of total worm burden.(11, 12). This observation could be explained by the differences in the degree of water contact among the pupils dictated by the demand for water which varies from household to household.

The results obtained in this study clearly indicate that frequency of contact with cercariae infested water body dictated by household need and proximity of schools to the water bodies is a major factor in acquisition of infection. Though direct mortality due to schistosomiasis may be low (1) the disease however imposes a heavy burden upon the health and well being of individuals, children who are persistently exposed to infection are likely to be debilitated. The risk of future complication is also high.

In view of the aforementioned, coupled with the leading role children play in the spread of urinary schistosomiasis, prompt

intervention in the study area is necessary. Therefore, health education and treatment of infected children is suggested as first line measure of intervention.

However, long term integrated control measure aimed primarily at improved water supply to the community as well as elimination of snail intermediate host is imperative.

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Table 1: Prevalence and intensity of *S. haematobium* infection by age group and sex

AGE	MALE			FEMALE			TOTAL		
	No. Exam	No. & % +ve	Mean egg count	No. Exam	No. & % +ve	Mean egg count	No. Exam	No. & % +ve	Mean egg count
7-10	125	34(27.2)	14.8±20.2	90	24(26.7)	7.5±9.8	215	59(27)	11.8±17.0
11-14	191	89(46.6)	20.5±36.6	198	40(20.2)	8.3±11.1	389	129(33.2)	15.3±17.0
15-18	14	4(28.6)	29.3±34.9	6	0	0	20	4(20)	29.3±34.9
TOTAL	330	127(38.5)	19.2±32.9	294	64(21.8)	8±10.6	624	191(30.6)	15.5±27.9

Table 2: Prevalence and intensity of *S. haematobium* infection by school

School	MALE		FEMALE		TOTAL		
	No. exam.	No. & % +ve	No. exam.	No. & % +ve	No. exam.	No. & % +ve	Mean egg count/5ml urine
St. Mich. Pry. Schl.	181	89(49.2)	197	49(24.9)	378	138(36.5)	13.8±19.4
Comm. Pry. Schl.	64	25(39.1)	47	11(23.4)	111	36(32.4)	25.2±50.6
St. Mich. Nurs/Pry. Schl.	59	6(10.2)	30	3(10)	89	9(10.1)	6.3±11.6
Jamat Nurs/Pry. Schl.	26	7(26.9)	20	1(5)	46	8(17.4)	11.5±15.1
TOTAL	330	127(38.5)	294	64(21.8)	624	191(30.6)	15.5±27.9

Table 3: Distribution of snails in water bodies in Esie

Water bodies & sites		Snail Species & No Collected	Schistosome infection in snail
Osin	A	<i>Melanooides</i> sp (82)	-
	B ₁	<i>Biomphalaria pfeifferi</i> (3) <i>Bulinus globosus</i> (34)	Empty shells +
	B ₂	Nil	Nil
Osuolo	C & D	Nil	Nil
Endu	E & F	Nil	Nil

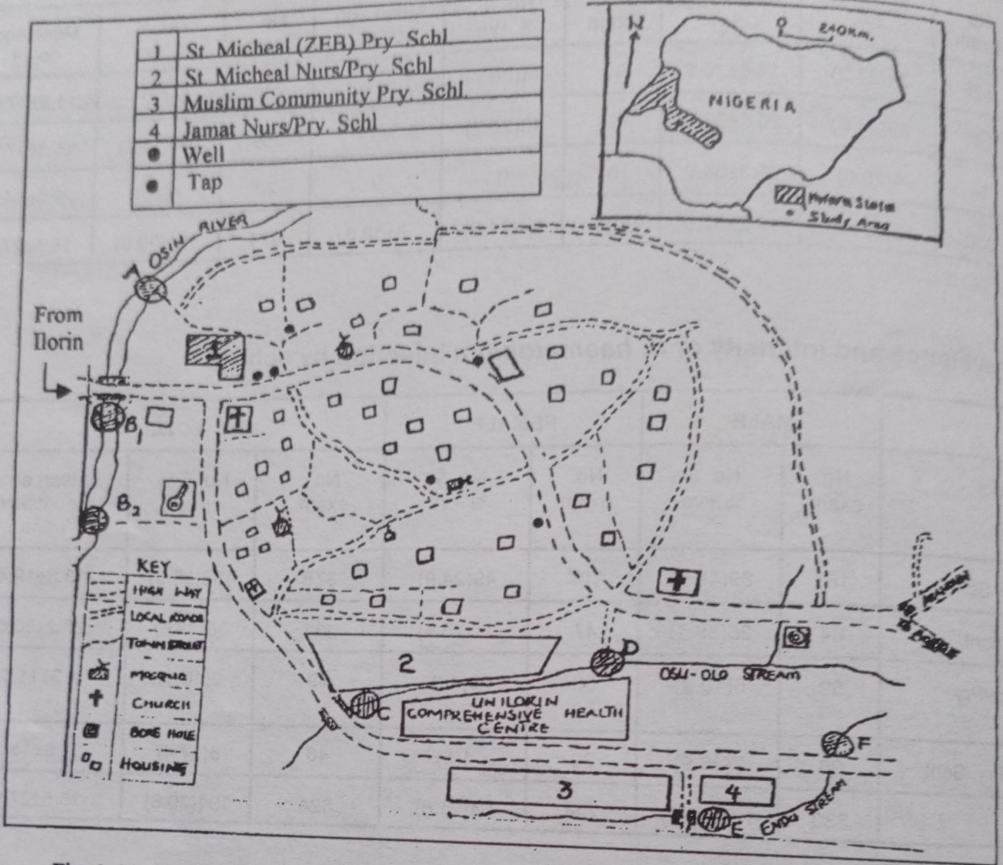


Fig. 1: Map of study area (with an inset) showing school locations (1-4), and sites of malacological study (A-F)

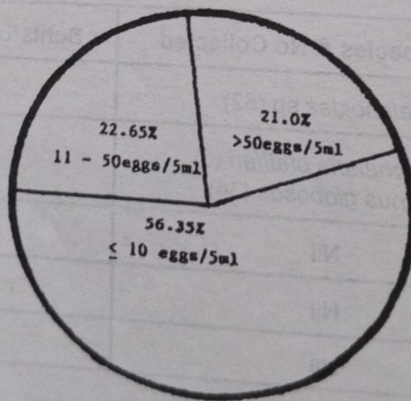


Fig. 2: Proportion of intensity of infection as shown by mean egg count /5ml of urine