

Full Length Research Paper

## Epidemiology and prevalence of urinary schistosomiasis in pre-school children in Lagos, Nigeria

Adewole, S. O.\* and Fafure, T. H.

Department of Zoology, University of Ado Ekiti, P. M. B. 5363, Ado- Ekiti, Ekiti State, Nigeria.

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The prevalence of urinary schistosomiasis in pre-school children below the age of 5 years in five settlements was investigated. Of the 1,402 children examined and screened for schistosomiasis, 573 children representing 40.8% were infected. Females between the ages of 3 to 4 years had the highest infection of 37% while the least percentage prevalence of 6.4% was recorded in females below one year. Similarly, males between the ages of 3 to 4 years had the highest percentage of 28.9% while 7.1% prevalence was recorded in age cohort below one year. The prevalence of infection was higher in the male children representing 22% while the female recorded 18.8%. The highest prevalence of haematuria (43.5%) was recorded between 4 to 5 years, followed by 3 to 4 years age cohort with 31.4 and 0.0% in the ages between 1 to 3 years. However, there was no significant difference ( $t = 1.51$ ;  $P > 0.05$ ) in the level of infection between male and female subjects. Similarly, there was no significant difference ( $t = 1.67$ ;  $P > 0.05$ ) in the prevalence of infection at the study locations. The intensity and prevalence of the infection increased significantly ( $P < 0.05$ ) with age. There was a positive correlation ( $r = 0.37$ ;  $P < 0.05$ ) between individuals infected in the different locations. In these settlements, schistosomiasis was caused by unsanitary habits, contact with stagnant water which accumulate due to poor drainage and fishing activities by the communities.

**Key words:** Prevalence, transmission, schistosomiasis, pre-school children, snail and parasite.

### INTRODUCTION

Urinary schistosomiasis is one of the main occupational diseases acquired by man through activities associated with fresh water such as washing, bathing, fishing and recreation (Mafiana et al., 2003). Schistosomiasis, being mainly an occupational disease, principally affects people engaged in agricultural activities or fishing, but in many areas, a population of children are infected (Okoli and Odaibo, 1999).

In Nigeria, schistosomiasis due to *Schistosoma haematobium* is wide spread and constituting a public health problem, particularly in children (Akogun, 2008). The snail host of *S. haematobium* are species of the

*Bulinus* and *Planorbidae* which act as the intermediate host where the miracidium develops (Ezeamama et al., 2005). In an investigation carried out by Mafiana et al. (2003) on surface water use and its potential for the transmission of parasitic diseases, it was observed that pre-school children in communities near the Oyan reservoir constituted an unexpectedly high proportion of children with water contact. The infection and transmission in pre-school children would occur through early exposure to infected water bodies when they accompany their mothers to fishing, bathing and washing activities. Also, at about three years of age, exposure

\*Corresponding author. E-mail: Samson\_adewole@yahoo.com.

**Table 1.** Prevalence and intensity of infection with *Schistosoma haematobium* by age.

Age group (years)	Number examined	Number infected (%)	Intensity of infection (%)		
			Negative	Light	Heavy
Under 1	92	39 (42.4)	57.6	42.4	0.0
1 – 2	213	94 (44.1)	55.9	44.1	0.0
2 – 3	273	101 (37.0)	63.0	32.3	4.7
3 – 4	396	187 (47.2)	52.8	40.6	6.6
4 – 5	428	152 (35.5)	64.5	29.3	6.2
Total	1,402	573 (40.8)	59.2	37.3	3.5

to infection was unaided as most children had acquired the ability to swim, bath and wash on their own (Mafiana et al., 2003).

The social aspects of the parasite infection has a lot of stigma associated with it, some of which include the challenges of semi immorality, depression as well as mental ill-health due to embarrassment (Akogun, 2008). The higher prevalence of the disease in male children is due to higher water contact since their fathers engage every male in their household profession usually fishing, while females are usually more restricted from swimming and bathing in rivers due to religious and socio-cultural backgrounds but still perform other activities such as washing (Ndvomugenyi and Minjas, 2001).

In view of the paucity of information on the distribution of schistosomiasis in these settlements in Lagos State and the general concern that the disease may be increasing in prevalence, distribution and importance, this study was undertaken to establish the occurrence, prevalence and intensity of *S. haematobium* infection among pre-school children in the area of Lagos State, Nigeria.

## MATERIALS AND METHODS

### Study area

The study was carried out in five selected communities in Lagos State. These communities are Ajegunle (Pako estate), Zion (Sari Iganmu), Orile Iganmu, Badir and Epe, respectively. These places are known for lack of proper drainage systems and poor sanitary habits. The roads are very deplorable, thereby becoming flooded with water both during the rainy and dry season, and quite inaccessible. The stagnant water becomes filled with human wastes due to indiscriminate urination and defaecation. Fishing activities predominate at Epe.

### Ethical clearance

Before the commencement of the study, we intimated the village heads on the objective of the study and obtained their consent. The communities were then later mobilized to participate in the study.

### Parasitological investigation

A house-to-house census was conducted with the assistance of medical personnel during which children below 5 years of age in the five communities were listed. Children were registered using an

epidemiological field form which documented their age, sex, household head and community (Mafiana et al., 2003). Urine samples were collected from 1,402 children and tested for *S. haematobium* using the sedimentation of urine by gravity method (Asaolu and Ofoezie, 1990). Urine samples were collected between 10.00 a.m. and 2.00 p.m. and once from each child. Mothers were given specimen bottles with the instruction to collect any voided urine between the specified hours from children below 3 years. The intensity of infection was expressed as negative (0 egg/10 ml urine), light (< 50 eggs/10 ml urine) and heavy ( $\geq$  50 eggs/10 ml urine). In addition, haematuria (visible blood) in urine was scored visually.

### Statistical analysis

Descriptive statistics were used to calculate the percentage(s) infection and significant differences between males and females susceptibility to infections. Also, correlation coefficient was used to test the level of correlation between individual(s) infected in locations.

## RESULTS

Of the 1,402 children examined and screened for *S. haematobium*, 573 children representing 40.8% were infected. Children between the ages of 3 to 4 years had the highest infection representing 47.2% while the least percentage prevalence of 37.0% was recorded in 2 to 3 years age cohort (Table 1). The highest prevalence of haematuria (43.5%) was recorded between 4 to 5 years, followed by 3 to 4 years age cohort with 31.4 and 0.0% in the ages between 1 to 3 years.

The overall prevalence of infection was higher in the male children with 18.8%. There is no significant difference ( $t = 1.67$ ;  $P > 0.05$ ) in the level of infection between male and female subjects. In a similar development, there is no significant difference ( $t = 1.67$ ;  $P > 0.05$ ) in the prevalence of infection at the study locations. However, there is a positive correlation ( $r = 0.37$ ;  $P < 0.05$ ) between individuals(s) infected in the different locations. Table 1 shows that 37.3% of the children had light infection while 3.5% had heavy infection. The levels of infections in the five selected communities are shown in Figure 1. It is evident from Figure 1 that Epe community had the highest infection of 32.2% while the least infection of 7.5% was recorded in Orile Iganmu.

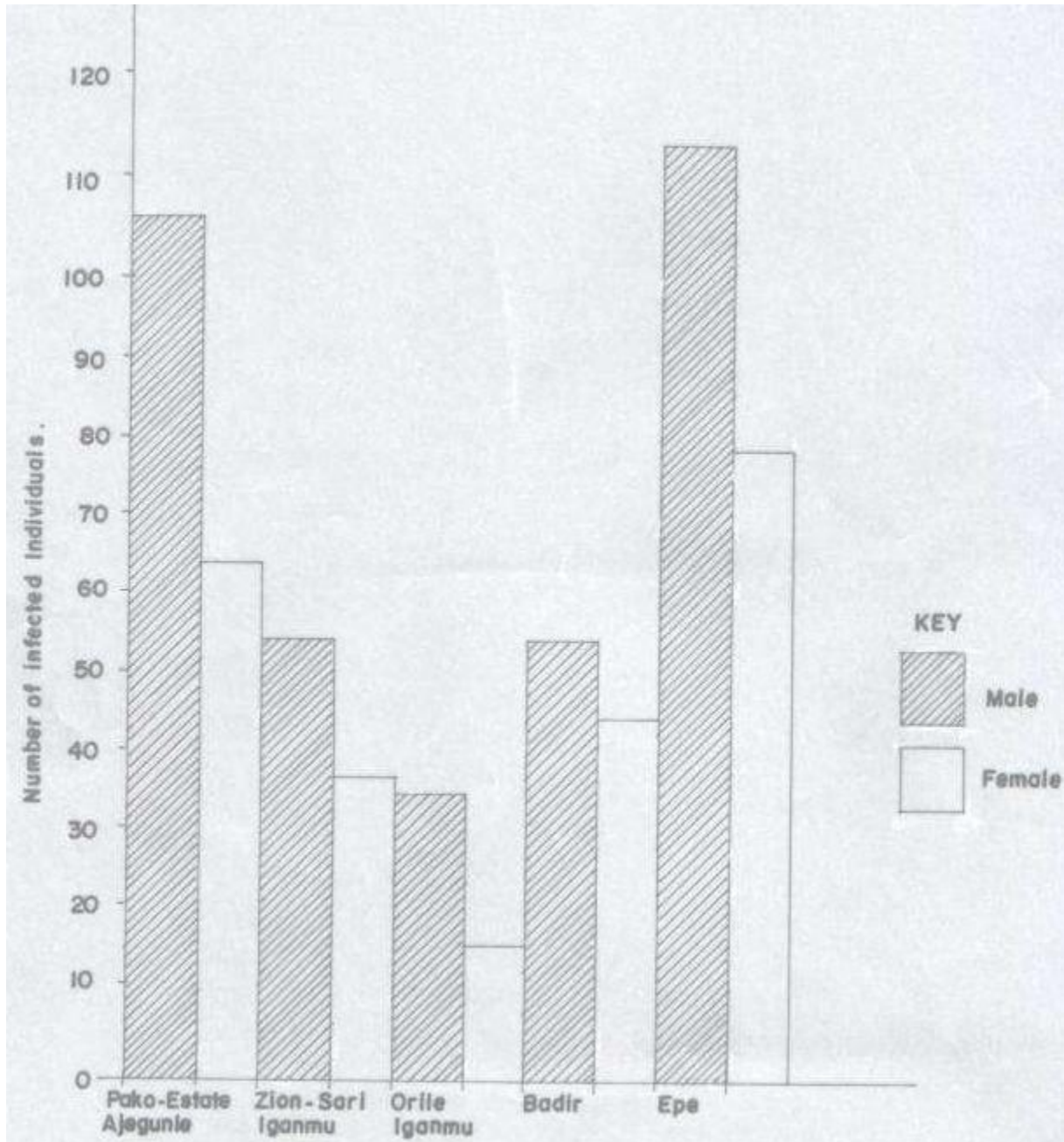


Figure 1. Infected individuals in different location.

## DISCUSSION

This study shows that schistosomiasis is prevalent among the pre-school children in selected communities in Lagos State. In Nigeria, helminthic infections are still a disease of poverty, as there exist a strong correlation between socio-economic status and parasitosis in children (Mafiana et al., 2002b). In this investigation, a higher prevalence (47.2%) was found in children between 3 to 4 years which is very high compared with Egypt: 14.5% noted by Nour et al. (1990), and none in that age group

seen by El Katsha and Watts (1997). Also, Mafiana et al. (2003) recorded 71.8% prevalence of schistosomiasis in pre-school children in Oyan, Nigeria which is much higher than 40.8% prevalence recorded in this study. The differences may be attributed to the fact that collection of urine samples was extended to 2.00 pm in some cases because of the difficulty in obtaining samples from these younger age cohort.

However, Akogun and Akogun (1996) recorded a prevalence of 47% similar to ours in children aged 3 to 5 years in a settlement near Lake Geriyo near Yola, Nigeria.

Of particular interest in our study is the pro-portion of infants (42.4%) who had acquired the infection before the age of 1. It is therefore likely that infection is acquired very early in life through water contact in these and other communities that live by Lakes or reservoirs where no other safe source of water supply is available (Mafiana et al., 2003). Infection and transmission in pre-school children occurred through early exposure to infected water bodies when they accompany their mothers to fishing, bathing and washing (Adewole et al., 2001; Okoli et al., 2006).

The non-significant difference ( $P > 0.05$ ) between males and females susceptibility to infection may be due to the fact that both sexes received their initial infection at about the same age (Mafiana et al., 2003). The higher prevalence in ages 3-5 years old may be attributed to the fact that they are allowed to roam about the streets bare footed, and males play games such as hide and seek, soccer inside the water. Most residents are aware of the health risks of wading in the polluted water yet they lack the capacity to change their behaviour (Adewole and Olofintoye, 2004).

The recognition of schistosomiasis as a major health problem is still limited in these communities as previously observed by Ofoezie et al. (1998). Any control measure that is to succeed here must involve the communities (El Katsha and Watts, 1997), such as developing participatory health education programmes with community members to effect behavioural change by mothers who expose their young children to *S. haematobium* infection. Mothers should wear protective shoes and gloves while in contact with water as well as providing a community crèche where mothers could leave their young children when going for fishing or other water contact activities in the study area.

Children in the study area should be restrained from bathing or swimming in the stream, stagnant water and pools of water on surface ground. Parents in the study area should be encouraged to boil drinking water before use. In areas where the disease is endemic, as a result of water source, projects and fishing activities predominate. There is urgent need to incorporate active schistosomiasis control strategy to prevent the possible spread of the disease to other parts of Lagos State. Therefore, this study demonstrates that urinary schistosomiasis is still being actively transmitted among the pre-school children in Lagos State. It is therefore very indispensable to extend the already incorporated control programmes in both primary and post primary schools to pre-school children.

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