SOCIO-ECONOMIC AND WATER CONTACT STUDIES IN *Schistosomiasis haematobium* INFESTED AREA OF ANAMBRA STATE, NIGERIA

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ABSTRACT

A survey of urinary schistosomiasis in Agulu, Anambra state, Nigeria was carried out using primary school pupils. The relationship between family socio-economic status of the pupils and infection with Schistosoma haematobium and between water contact activities of the people with S. heamatobium was investigated. Seven primary schools out of fifteen in the town had pupils with Schistosoma haematobium infection. Children whose parents were farmers and teachers had infection rates of 38.9% and 14.4% respectively. A greater number of children (7,000) (74.2%) than adults (2,438) (25.8%) perform different activities in different parts of the lake which bring them in contact with the water during the period of study. The highest number of people (3,324) (35.2%) were engaged in swimming while the lowest number 480 (5.1%) were found fishing.

Keywords: Water contact, *Schistosoma haematobium*, Socio-economic

INTRODUCTION

Knowledge of the pattern of exposure to infection is essential to an understanding of the epidemiology of *S. haematobium* infection. Human contact with water arises from four major basic needs. These include occupational, recreational, domestic and socio-cultural. Among the few studies on human water-contact patterns in tropical Africa are those by Dalton and Pole (1978) in lake Volta, Ghana, Tayo *et al* (1980) in Malumfashi in northern Nigeria. The demands of occupations like fishing or farming in which many in the rural areas are engaged bring them into regular contact with water. Thus, such people are constantly exposed to infection. The activities of women and children which involve washing of house hold utensils and fetching of water in the morning or evening also take them to water sites. These activities are seen to enhance transmission (Ukoli, 1990). Water-contact studies can therefore be a useful means of determining the principal human activities that create a high risk of exposure to schistosomiasis in areas where it occurs. They also serve as means of assessing possible reductions in human exposure to cercarial populations and subsequent worm burdens through control measures.

The socio economic background of school children taking into consideration their parents' or guardians' occupation could also influence the infection rate of schistosomiasis in areas where it occurs. So there is the need to study this aspect in endemic areas of the disease among school children because they provide convenient base line data for the whole population (Forsyth, 1969, Wilkins, 1977).

MATERIALS AND METHODS

Urine Collection and Socio-economic Investigation: Urine samples were collected from all the children in the seven primary schools in Agulu implicated in *Schistosoma haematobium* infection (Ekwunife, 2003) with wide mouthed screw cap containers. A simple centrifugal sedimentation procedure (5 min. at 5000 rpm) of 10ml aliquot urine sample drawn from each specimen (Oliver and Uemura, 1973) was used for analysis. *S. hametobium* ova in the sediment poured on a McMaster slide were counted using a binocular microscope (X 100). During the urine collection, inquiry about the occupation of the parent/guardian of each pupil was made and this was recorded against the person's identification number.

Water Contact Studies: For six months (October 2000 to March 2001) human activities in Agulu lake were observed and recorded. The ages of the people were also recorded. Observation was made on daily basis. This was done every evening between 4 pm and 6 pm except on Sundays. On Saturdays the human activities were observed from 8.00 am till 6.00 pm. These are periods when activities like washing of household utensils, fetching of water and fishing take them to the water sites.

Table 1: Variation among individuals from families of various occupational groups infected with urinary schistosomiasis in the different schools

School	Traders		Farmers		Teachers		Other civil servant		Others	
	No. Ex.	No Inf.	No. Ex.	No Inf.	No. Ex.	No Inf.	No. Ex.	No Inf.	No. Ex.	No Inf.
Umuowelle Primary School	46 (52.2)	24	70 (71.4)	50	14 (35.7)	5	30 (40.0)	12	41 (48.8)	20
Ugwuaba Primary School	34 (44.1)	15	63 (50.8)	32	12 (16.7)	2	32 (15.6)	5	44 (31.8)	14
Community Primary School	61 (37.7)	23	77 (45.5)	35	12 (16.7)	2	29 (17.2)	5	40 (27.5)	11
Nneogidi Primary School	40 (32.5)	13	64 (35.9)	23	10 (20.0)	2	30 (15.0)	4	42 (13.0)	13
Practicing Primary School	142 (22.5)	32	185 (31.9)	59	25 (12.0)	3	81 (13.6)	11	99 (23.2)	23
Ifiteani Primary School	30 (23.3)	7	46 (30.4)	14	8 (12.5)	1	27 (7.4)	2	30 (30.0)	9
Obeagu Primary School	41 (4.9)	2	53 (7.5)	4	9 (0)	0	30 (0)	0	36 (28)	1
Total	**394 (29.4)**	**116**	**558 (38.9)**	**271**	**90 (14.4)**	**13**	**259 (15.1)**	**39**	**332 (27.4)**	**91**

Table 2: Distribution of individuals by age and water contact activities

Activity	No of children (0 – 9 yrs) Observed / %	No of Adults (> 20 yrs) Observed / %	Total
Domestic			
Washing cloths and Utensils	1,000 (62.5)	600 (37.5)	1,600(17.0)
Fetching water	2,080 (90.5)	218 (9.5)	2,298(24.3)
Processing breadfruits and fermenting cassava	806 (46.4)	930 (53.6)	1,736(18.4)
Recreational			
Swimming	2,914 (87.7)	410 (12.3)	3,324(35.2)
Economic			
Fishing	200 (41.7)	280 (58.3)	480(5.1)
Total	**7,000 (74.2)**	**2,438 (25.8)**	**9,438**

RESULTS

Information on schistosomiasis infection in children with different socio-economic background from different schools are presented in Table 1. Urinary schistosomiasis was wide spread in children from families of different occupational groups in the endemic communities. Pupils from farming families had the highest infection rate of 38.9 % followed by those from trading families with 29.4 %. In all schools, except Ifiteani Primary School, children whose parents were teachers had the lowest infection rate.

The results of the six months observation of human activities on water sites (Agulu lake arms) are shown in Table 2. More children 1,000 (62.5 %), 2,080 (90.5 %), 2,9149 (87.7 %) than adults 600 (37.5 %), 281 (9.5 %), 410 (12.3 %) were observed washing clothes/utensils, fetching water, and swimming in the lake respectively. Though more adults were seen performing activities like processing breadfruit, fermenting cassava and fishing, on the whole a greater number of children 7,000 (74.2 %) than adults 2,438 (25.8 %) were seen performing different activities in different parts of the lake which bring them in contact with the water. The highest number of people 3,324 (35.2 %) were found swimming.

DISCUSSION

The children's socio-economic background taking into consideration their parents or guardians occupation showed that those from farming family had the highest infection rate. This was probably because they joined their parents at farm during the holidays, for Okafor (1984) reported that farmers bath in the fresh water, streams and or pools near their farms after each day's work. In the study population, most farmers were ignorant of the mode of transmission of the disease and so they might not have known the implication of the

lake in the transmission of the disease and even few that know seemed to neglect it (Emejulu, 1994). Traders' children were next to farmers' with infection rate of 29.4%. Most members of this group were also ignorant and so may suffer the same fate as the farmers. The children of teachers and civil servants' were the least infected. This suggests that community motivated health education campaign on the mode of transmission of the parasite could be effective in reducing the disease infection rate in this study population.

The communal life in Agulu is such that domestic activities like washing of clothes and utensils and fetching of water are the sole responsibility of the children. Swimming carried the greatest risk followed by fetching of water. School children were also observed swimming in the lake. This was probably the cause of the high prevalence recorded for them. Wilkins (1987) stressed that recreational use of water for swimming and playing is usually of greater importance to younger children. He thus pointed out that for children, such activity might carry a high risk of infection as it often involves much of the body being in contact with water for long periods of time. Other studies (Dalton, 1976, Dalton and Pole 1978, Tayo *et al* 1980, Kvalsvig and Schutle, 1986) showed varying age groups to be at risk. Some workers observed that adult males are usually the group involved in occupational exposure in fishing and farming. Thus the diversity of human society and behavoiur make it difficult to draw valid general conclusions about the results of these and other water contact studies. However, it has often been found that the majority of contact is domestic and recreational but that children have more contact than adults. It is thus established by this study that the level of water contact is usually lower in older people. Some researchers have suggested that acquired immunity may be responsible for the lower egg output in adults. Dalton and Pole (1978) stated however that there is no need to postulate some mechanism such as immunity as playing a significant role in the distribution of infection by age.

This study has also shown that the reduction in egg output which researchers like Wilkins (1987) attributed to immunity, was closely related to a lower level of water contact for older people, thus providing a simpler explanation than that of intrinsic immunity. By water contact observation it has been possible to identify which human activities carried the greatest risk. The elimination or reduction in intensity of these particular activities by control measures may provide the best means of reducing the output of eggs in human urine, and hence the worm burden of the population.

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