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Detection of urinary schistosomiasis among school age children in Ukwuani L.G.A of Delta State, Nigeria

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Abstract

Schistosomiasis is a water-borne disease also known as bilharziasis or snail fever. It is a major disease of public health and the second most prevalent tropical disease after malaria. This study was carried out to detect the prevalence of urinary schistosomiasis among school children in Ukwuani L.G.A of Delta State, Nigeria. Urine samples (n=280) were collected from 9 volunteered primary and post-primary schools between May and July, 2009. Centrifuge concentration technique was used in the analysis of urine samples for the eggs of Schistosoma haematobium. 16 (5.71%) were infected with the parasite with males having a slightly high prevalence rate of 10 (3.57%) than females 6 (2.14%). Males within the age group of 11-20 were found to have the highest rate (2.14%) compared with their females (1.43%). This result is indicative of low visit to the hospital following infection of any kind and the source of drinking water in the community was poor. Many of these children engage in different water activities such as fishing, swimming, washing and fetching of water. The statistical analysis using T-test ($P<0.05$) showed no significant difference in the prevalence rate between age and sex. Therefore regular health education on the possible transmission of this parasite and community based treatment should be embarked upon in the school and community so as to curtail the spread and re-infection of individuals.

Keywords: *Urinary schistosomiasis, urine, school age children, Schistosoma haematobium*

1. Introduction

Schistosomiasis, also known as bilharziasis, is a parasitic disease that leads to ill health. It is a major health risk in the rural areas of developing countries where it continues to rank high (Oniya, 2007). The disease is indicated either by the presence of blood in the urine or in the case of intestinal schistosomiasis, by a typical symptoms, which can lead to enlargement of the liver and spleen (W.H.O., 2004). The disease affects some 200 to 300 million people across Africa, South America, the Caribbean, the Middle East, China and South East Asia (W.H.O., 2004). Schistosomiasis, a parasitic disease caused by digenetic trematodes of the genus *Schistosoma* is a parasite of the blood stream of warm-blooded vertebrates. Generally, their life cycle revolves around two hosts: a definitive host (vertebrate) and an intermediate host (mollusc) (Sam-Wobo *et al*., 2009; Ukoli, 1991). Human exposure to fresh water in under developed tropical and sub-tropical areas suffering from this problem is the major determinant to infection. Endemicity may be linked to behaviour, lack of education, public health facilities, appalling sanitary conditions and poverty in this part of the world (Ukoli, 1992).

Schistosoma haematobium, the causal organism of urinary schistosomiasis, is one of the two species (*S. mansoni*) that have been reported in Nigeria and more widely spread (Mbata *et al*., 2008). In Nigeria, *Schistosoma haematobium* infection had been found in many parts of the country with varying intensities and prevalence rates and incidence is believed to be on the increase (Okon *et al*., 2007). The true epidemiological data appears difficult in developing nations, because of inadequate researches and no epidemiological control/ information centre on tropical diseases despite its relevance in planning for control in any locality. This problem is due to the poor habits of people in developing countries to visiting hospitals for treatment, engaging on self medication and local treatment. This paper tends to detect the prevalence of urinary schistosomiasis among school age children in some rural communities in Ukwuani L.G.A and to add to the epidemiological information of this tropical disease.

2. Materials and Methods

2.1 Study Area/Sample Collection

Urine samples were collected from volunteered pupils of 5 primary and 4 post-primary schools between the ages of 5-20 years (n = 280) selected from 6 rural communities viz: Umutu, Umuaja, Obinomba, Ebedei, Umukwata and Amai-Umuosele in Ukwuani L.G.A of Delta State, South-South, Nigeria, lying between longitude 5^o 20'E and latitude 6^o 17'N. Tight-fitted, screw-capped containers were given out to pupils to collect urine samples after proper health education and were also monitored for the urine collection. Demographic information of volunteered pupils such as name, sex, age, occupation of parents and after school activities was obtained. The samples were collected between the hours of 10:00am and 2:00pm and were taken to the laboratory in a dark box for parasitological examination.

2.2 Processing of Samples

10ml of each urine samples was collected into the 10ml centrifuge tube and subjected to centrifugation at 2000rpm for 5minutes (Model: 800B Centrifuge). The supernatant was decanted and sediment was transferred to a microscope slide covered with coverslip and viewed under 10x objectives. The characteristic eggs of *S. haematobium* was sought for and the total number of eggs present in each 10ml urine sample were counted using a Talley-hand counter (Ejima and Odaibo, 2007).

2.3 Statistical Analysis

The questionnaires elicited from this study were statistically analysed using T-test analysis, by SPSS 14.0 and the baseline data includes: information on sex, age,

occupation of parents, water contact behaviour etc.

3. Results

Urinary schistosomiasis reported showed that 16 (5.71%) from the 280 respondents who had their urine samples examined harboured *S. haematobium* ova in their urine with males having a prevalence rate of 10 (3.57%) and females 6 (2.14%) (Table 1). Males within the age group of 11-20 years had the highest prevalence rate of 4 (2.14%) compared to the female within the same age group with 2 (1.43%). The demographic analysis in this study showed that there were more male respondents 158 (56.4%) than females 122 (43.6%) from the 9 schools under study. Assessing the occupation of parents/guardians of respondents, 168 (60.0%) were farmers; 48 (17.2%) were petty traders; 22 (7.9%) were business men and women; 37 (13.2%) were into public service and 5 (1.8%) were into private service (Table 2).

From the 280 respondents, 243 (86.8%) visited a water body; 118 (42.2%) were engaged in washing; 95 (33.9%) for swimming; 17 (6.1%) for fetching of water and 13 (4.6%) for fishing (Table 3). Respondents having difficulty in urination are 29 (10.4%) and those observing blood during urination are 22 (7.9%) (Table 3). Table 3 also revealed respondents source of drinking water. 169 (60.4%) drink from bore-hole; 61 (21.8%) from pipe-borne water and 50 (17.9%) from streams or river.

4. Discussions

The global challenge posed by tropical diseases has continued to grow from one locality to another in developing areas. This study revealed an overall prevalence rate of 5.71%. Though it appeared relatively low in the area under study, but constitutes a potential risk of public health problem if not curtailed early. This result is similar to a recent study by Ekwunife *et al.* (2009) from the neighbouring local government areas (Ndokwa East), which had the first outbreak of urinary schistosomiasis at 6.8% prevalence rate. Similar findings were reported by Nmorsi *et al.* (2005) who reported lower values (32.6% & 21.4%) in 2001 and later recorded a high prevalence rate (65%) in 2005 from the same zoogeographical zone.

The report of this study showed that the prevalence of urinary schistosomiasis did not vary with gender or age which is in contrast with works by other researchers (Uwazuoke *et al*., 2009; Sam-Wobo *et al*., 2009; Ejima and Odaibo, 2007; Anosike *et al*., 2003; Anosike *et al*., 2001) while it was supported by Mbata *et al.* (2008), Okon *et al*. (2007) and Ekwunife *et al.* (2009). Statistical analysis showed that neither sex nor age had a significant influence on the prevalence of the disease in the area. There was no sharp margin between the rate of infection in males (3.57%) and females (2.14%). The slightly higher prevalence rate (3.57%) observed among the age group 11-20 years is expected as that is the age that appears to be more adventurous in terms of fishing, swimming, snail hunting and washing clothes (Pukuma and Musa, 2007; Nmorsi *et al*., 2005). This age group contribute significantly to the potential contamination of the environment and consequently to the transmission of the disease. It is also evident from this work that those whose water contact activities are through swimming (33.93%) and washing (42.15%) could be infected and re-infected. Thus, 10 out of 16 respondents found with *S. haematobium* eggs observed blood (62.5%) during urination. This number is capable of infecting other children and to be re-

Table 1. Prevalence of urinary schistosomiasis among school aged children by age group and sex in Ukwuani L.G.A.

	No. of individuals examined			**No. of individuals infected**			**% Prevalence**		
Age gp.	Male	Female	Total	Male	Female	Total	Male	Female	Total
5-10	75	67	142	4	2	6	1.43	0.71	2.14
11-20	83	55	138	6	4	10	2.14	1.43	3.57
Total	158	122	280	10	6	16	3.57	2.14	5.71

Table 2. Respondents Demographic Information I.

		Freq.	**%**	**Mean**	**Std. D.**	**Variance**
Age (years)	5-10	150	53.6	1.4643	0.49962	0.250
	11-20	130	46.4	1.4357	0.49674	0.247
Gender	Male	158	56.4	1.2857	0.45256	0.205
	Female	122	43.6	1.8571	1.19180	1.420
Pupils Educational Status						
	Primary	200	71.4			
	Secondary	80	28.6			
Occupation of Parents/Guardians						
	Farming	168	60.0			
	Petty trading	48	17.1			
	Business	22	7.9			
	Public Service	37	13.2			
	Private Service	5	1.8			
	Others	0	0			

Table 3. Respondents' demographic information II.

	Response	Frequency	%
Reasons for visitation to water body	Swimming	95	33.93
	Washing	118	42.15
	Fishing	13	4.64
	Fetching	17	6.07
	Total	243	86.79
Difficulty in urinating	Yes	29	10.4
	No	251	89.6
	Total	280	100.0
Observation of blood during urination	Yes	10	3.6
	No	270	96.4
	Total	280	100.0
Source of drinking water	Pipe borne water	61	21.8
	Bore hole	169	60.4
	Stream or river	50	17.9
	Total	280	100.0
Visitation to Clinic or Hospital	Yes	39	13.9
	No	241	86.1
	Total	280	100.0

infected within a short period. This observation has been supported by Mbata *et al*. (2008), Nmorsi *et al*. (2005) and Emejulu *et al*. (1994). The report of this study was also corroborated by Oniya (2007), that the majority of the subjects does not visit the hospital or use the drug of choice, which is praziquantel, following infection or symptoms. Thus, only 13.9% claimed to have visited hospital in this study. This observation could be due to the fact that most parents or guardians of these subjects are subsistence farmers with low or no education.

5. Conclusion

S. haematobium, the causal agent of urinary schistosomiasis is one of the tropical infections with high morbidity and mortality rates. This is the first study carried out from the study area on the prevalence of urinary schistosomiasis. Although transmission rate could not be ascertained, but it calls for an urgent treatment and control measures, so as to curtail the spread of infection. It is therefore recommended that: routine studies are carried out regularly to ascertain new infection or re-infection; community-based health programmes (with the use of praziquantel as the drug of choice) be organized in schools, market places, community halls etc. and adequate provision of pipe-borne water or treated bore-holes for the community. Urinary schistosomiasis is therefore reported from this study as being endemic in Ukwuani L.G.A. Though of a low prevalence, it is of public health significance and could pose a threat or problem to important socio-economic activities in the area.

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