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Prevalence and intensity of Urinary Schistomiasis among the Abriba Peopleof Abia State, South Eastern Nigeria

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ABSTRACT: In an attempt to establish the endemicity and intensity of *Schistosoma haematobium* infection in Amagodu, an Abriba hamlet, a total of two hundred and thirty urine samples were collected from 110 males and 120 females aged 0-80 years and examined for the ova of the parasite using the simple centrifugation technique between the months of July and September, 2008. Haematuria and proteinuria estimation was conducted by the medi-test combi 9 method. Results showed an overall prevalence rate of 10%. Males had slightly higher and statistically signicant ($P<0.05$) prevalence rate (6.4%) than the females (3.6%) and an insignificantly higher intensity of infection (mean egg counts; 11eggs/10mls urine) than the females (10.3 eggs/10ml urine) Subjects within the age bracket of 13-25 years had the peak prevalence (4.8%) and highest intensity of infection (40.2eggs/100ml). Prevalence of infection varied according to the water contact activities, swimmers having the highest prevalence of 3.9%. Schistosomiasis was found to be markedly associated with haemturia (42.5 Ery/ul and 24.1 Ery/ul for the infected and non infected subjects respectively) and proteinuria (23.1 mg/100ml as against 13.0 mg/100ml for the control group). The study draws attention to the health harzards posed by urinary schistosomiasis among the Abriba people of South-eastern Nigeria.

KEY WORDS: *Prevalence, urinary schistosomiasis, Abriba people, Schistosoma haematobium, Abia State, Nigeria*

INTRODUCTION

Schistomiasis, also known as bilharziasis (Nester *et al,* 1998), is a parasitic infection caused by blood flukes of the genus *Schistosoma* and transmitted by particular fresh water snails (Agi and Okafor, 2005). The disease is endemic in 74 developing countries (600 million people at risk) and infects over 200 million people of which an estimated 120 million have symptoms and 20 million suffer severe consequences of the disease (Anosike *et al*, 2002).It is estimated that 11 million Nigerians are infected with Schistosomiasis especially in the dry Northern areas where *Schistosoma haematobium* is focal and acquired in seasonal pools (Anyanwu and Okoro, 2002). Four major Schistosoma species which infect humans are *S. haematobium, S. mansoni S. intercalatum* and *S. Japonicum*.

S. haematobium causes urinary Schistosomiasis which is the passing out of blood in urine due to the invasion of the veins in the bladder by the worm. Urinary Schistosomiasis is reported to be more prevalent in Nigeria than intestinal Schistosomiasis as a result of larger distribution of its snail host and indiscriminate passing of urine harbouring *S. haematobium* eggs into water housing the snail host (Ejeizie, 1991, Ugbomoko, 2000; Agi and Okafor, 2005). The presence of snail intermediate hosts of the parasites and increased human contact with the infected waters are the key determinant factors which favour the transmission of the disease. Infection occurs when the skin comes in contact with contaminated fresh water harbouring the snail intermediate host. People at maximum risk are those who live or travel in endemic area and make contact with water containing the potential intermediate host.

Occurrence of urinary Schistosomiasis has been established in Nigeria (Cowper, 1963, Plugh *et al*, 1979; Adewunmi *et al* 1990). The prevalence noted in these reports ranges from 15% to more than 50%. Recent surveys in the Ebonyi state, South-East Nigeria reported infection rates of 55.7% for *Schistosoma haematobium* (Anosike *et a*l, 2002). Transmission is always focal being mainly determined by Socio-cultural and ecological characteristics which promotes increased contact between man and the suitable snail intermediate host (Anyanwu and Okoro, 2002).The World Health Organization (1985) advocated that the combined administration of antischistosomal drugs coupled with environmental sanitation and health education be adopted for the optimum eradication of the schistosomiasis This approach has been employed in some endemic regions with fruitful results (Agi and Okafor, 2005).

Abia state is one of the South-eastern states in Nigeria carved out from the then Imo state. Although, schistosomiasis has been reported in some parts of South-eastern Nigeria (Anosike *et a*l, 2002), the author is not aware of any such documental evidence in Abia state in particular. This work was therefore conducted to determine the prevalence of urinary schistosomiasis among the people of Abia state, South-East Nigeria. The study is particularly significant as it will not only determine the endemicity of urinary schistosomiasis among the residents of the study area but will also identify sources of the infection , the knowledge of which are paramount for the prevention and control of the disease and enhancement of the health status of the people.

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MATERIALS AND METHODS

Study area:

The research was carried out in Amaogudu, (an Abriba hamlet) and Okoko (an Item hamlet) in Abia North Senatorial zone in Abia state. Amaogudu is thickly populated and noted for agricultural activities. The inhabitants use a stream called Osumanu as their chief source of water supply. This stream witnesses a regular optimal daily visitation by farmers, students and pupils. Similarly, Okoko is a typical agrarian community. The main source of water is a stream called Urudu which is used for washing farm products, bathing and drinking.

Study population:

The population for this study was drawn from pupils, students and adults resident in the hamlets. Two hundred and thirty persons (110 males and 120 females) were randomly selected for the study. Their ages ranged between 0 80 years. Involvement was purely voluntary and the people were enlightened through health education on the need of the study and its useful benefits. Those whose formal consent could not be easily obtained were excluded in survey. The control group consisted of subjects (90% of the study population) whose urines were screened and found to be negative for the ova of *S. Haematobium.*

Collection and processing of samples:

Each participant was given a sterile dry plastic bottle with screw lids to provide terminal urine between 10.00 am and 12.00 pm as most eggs are known to be excreted into patient's urinary bladders mainly in the late mornings or around noon. Each bottle was labeled indicating the sex, age and occupation of the owner. The presence of visible haematuria was noted. Parasitological diagnosis of schistosomiasis was based on examination of the individual's urine for the ova of *S. haematobium* using centrifugation technique (Okafor, 1984) and simple urinalysis method with Medi Test combi 9 reagent strip capable of detecting urinary blood protein and other indices.. About 10ml urine samples were collected from each shaken specimen bottle and spume for 5mins at 5000rpm. The sediments were transferred into a Petri-dish and examined using microscope for the *S. haematobium* ova.

Positive samples were confirmed based on the presence of eggs and/or positive urinalysis test (presence of blood in the urine). The number of eggs per 10ml of urine specimen was counted and graded as intensity of infection. Chi-square (x^2) analysis was used for the statistical testing of differences among villages, age classes, sexes and occupations.

RESULTS

23 (10%) of the two hundred and thirtty people examined from Amaogudu (an Abiriba hamlet) showed evidence of *Schistosoma haematobium* infection. Eggs of the parasite were not detected in any of the samples from Okoko (in Item). Of the 23 people affected, 6.4% and 3.6% were males and females respectively (Table 1) indicating that males had slightly higher and statistically significant prevalence rate than the females. ($X^2_{0.05\ (df\ 1)}$=3.841, X^2 calculated=0.08) Subjects within the ages of 13 and 25 years were more infected, (4.8%) than any other age group. Those between 26 38 and 0 12 years had prevalence rates of 1.7% and 2.6% respectively (Table 2). Also, prevalence of infection varied according to the water contact activities. Swimmers had the highest prevalence of 3.9% followed by those who use the stream water for washing purposes with a prevalence of 3.0%. Domestic users had a prevalence rate of 1.8% while subjects who use the stream water for other activities had the least prevalence (0.4%, table 4).

The mean egg burden for infection was 21.65 eggs/10ml urine, Mean Egg intensity result showed that males had a mean egg count of 11 egg per 10ml urine while females had mean egg count of 10.3 eggs per 10ml urine. There is no significant difference between the sex dependent mean egg counts.

Mean haematuria and proteinuria varied within the various age groups. The mean haematuria and proteinuria in group 0 12 were 80.4 Ery/ul and 58.4mg/100ml urine respectively while those for the age group of 26 38 years were 45.0 Ery/ul and 20mg/ 100ml urine. Those between the ages of 39 51 years had mean haematuria of 16 Ery/ul and mean proteinuria of 6.0mg/100ml urine (Table 2).

Table 1: Sex- dependent prevalence and intensity of *S. haematobium* in Amaogudu (an Abriba hamlet)

Sex	No. examined	No./% infected	Intensity of infection (egg count/ 100ml urine)
Male	110	14 (6.4%)	22
Female	120	9 (3.6%)	21.3

DISCUSSION

In spite of the overwhelming evidence of schistosomiasis in Nigeria (Anosike et al, 2002), the present finding indicates a low and absence of its endemicity amongst the people of Amaogudu (an Abriba hamlet) and Okoko (an Item hamlet) respectively. The overall low prevalence of 10% recorded in Abiriba community in the study contrasts with earlier observations in parts of Nigeria. (26% in parts of Bauchi state (Anosike *et al*, 1992), 48.8% in Adamawa state (Akogun *et al*, 1994), 44% in Cross River state, (Ekanem *et ai*,1995), 18.7% in Jos, Plateau state (Anyanwu and Okoro, 2002), and 55.7% in Ebonyi state (Anosike *et al*, 2002) and 83.3% in the Niger Delta area of Nigeria (Agi and Okafor 2005).

The survey showed that 12.7% of the males and 9% of the females were infected with egg mean intensity of 22/100ml and 21.3/100ml respectively. This implies that gender may be regarded as an important factor in the epidemiology of schistosomiasis due to S. haematobium in parts of Nigeria as previously observed by Udonsi (1990), Bello *et al*, (2003)

Table 2: Age- dependent prevalence, mean haematuria and protenuria and intensity of *S. haematobium* in Amaogudu (an Abriba hamlet)

Age group	No. examined	No./% of positive cases	Mean haematuria Ery/ul	Mean proteinuria mg/100ml	Intensity of infection (egg count/ 100ml urine)
0 – 12	80	6 (2.6%)	80.4	58.4	27.3
13 – 25	50	11 (4.8%)	72.3	31.0	40.2
26 – 38	45	4 (1.7%)	45.0	20.0	25.0
39 – 51	25	2 (0.9%)	16.0	6.0	15.75
Above 51	30	0 (0%)	0.0	0.0	0.0
Total	**230**	**23 (10.0%)**	**42.54**	**23.14**	**21.65**

Table 3: Age-dependent mean haematuria and proteinuria in Non- *Schistosoma haematobium* infected humans (control)

Age group	Total examined	Mean haematuria Ery/ul	Mean proteinuria mg/100ml
0 – 12	74	8	2
13 – 25	39	10	3
26 – 38	44	5	4
39 – 51	23	1	4
Above 51	30	0	0
Total	**210**	**24**	**13**

Table 4: Prevalence of *Schistosoma haematobium* by water contact activities.

Water activities	No Exam	Prevalence
Swimming	75	9 (3.9%)
Fishing	20	2 (0.9%)
Washing	65	7 (3.0%)
Domestic uses	50	4 (i.8%)
Others	20	1 (0.4%)
Total	**230**	**23 (10.0%)**

and Anosike *et al*, (2002). However, the report of Okafor (1984) had shown that prevalence of *S. haematobium* did not differ between sexes except when gender influenced water use and contact. Hence, persons who have greater contact with the bleeding foci have higher prevalence regardless of gender (Anosike *et al*, 2002). The present finding suggests that men had more contact with the bleeding foci (water).

The age group 0 15 years had the peak prevalence and highest egg counts. The observation agrees with those of Amadi (1993), Anyanwu and Okoro (2002), Agi and Okafor, (2005). This could be explained on the basis of the postulation that individuals in their teens who often times engaged in water related activities

that exposes them to the infection sites run the risk of acquiring more infection and harbouring more worms (Agi and Okafor, 2005). From the available records, the chief source of water supply for the inhabitant of Amaogudu in Abiriba is a stream distributed all over the place which serves as the main transmission foci in the community. Also, the stream witnesses a regular daily visitation by farmers, students and pupils and equally serves as a veritable meeting point for the Schistosoma parasites, their intermediate host and the people. Since,, the early adolescent individuals (0-15 years) are those principally involved in the various activities carried out in the stream, they could exposed to the infection more than the other age groups.

The prevalence among swimmers appeared to be higher than that of any other activities carried out in the stream. Younger people have great affinity for swimming and this elucidate the basic reason why the prevalence rate is high among them. Both pupils and student spend meaningful time in the stream, during and after school sessions.

The average mean haematuria and proteinuria was lower when compared with the earlier work of Useh and Ejezie (1996) on the prevalence and morbidity of *S.haematobium* in Adim, Cross River state, Bello et al, (2003) in Sokoto state (91.7) and Agi and Okafor, (2005) in Niger Delta area of Nigeria (64.3). Useh and Ejezie reported average mean haematuria and proteinuria to be 73.19 Ery/ul and 49.96mg/100ml respectively as against the average mean haematuria and proteinuria of 42.54 Ery/ul and 23.14mg/100ml respectively obtained in this study. This could be a reflection of the endemicity of infection in the two separate areas. Similarly, from the results of the control (non Schistosoma infected humans) it was noted that the higher haematuria and proteinuria indices in positive samples were significant. This suggests that proteinuria and haematuria are associated with schistosomiasis.

Although, the prevalence rate (10%) recorded in the present study is low, it nevertheless draws attention to the health risk posed by urinary schistosomiasis to the inhabitant of Abiriba in Abia state and the wider community majority of whom could be latent carriers of the disease. Against the background of the health hazards presented by *S. haematobium* and its associated socio-economic problems, it becomes pertinent that more studies on the distribution of the disease be embarked upon periodically.

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