ISSN 2249 – 622X

Asian Journal of Biomedical and Pharmaceutical Sciences

The Incidence of Urinary Schistosomiasis in Ohaukwu Local Government Area of Ebonyi

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Abstract

A prevalence study of urinary schistosomiasis involving 2,468 persons in nine villages of Ohaukwu Local Government Area of Ebonyi State was carried out between October 2002 and May 2003 Of the sampled subjects, 1,215 (49.2%) were positive for *Schistosoma haematobium* ova. Prevalence of the disease varied amongst villages but it was not statistically significant (p>0.05). Age differential showed a gradual increase from the less than five years old and reaching a peak in the 16-20 years and decreasing thereafter. Of the 2,468 persons examined, 1101 and 1367 were males and females respectively. While 575 (53.2%) males were infected, 640 (46.8%) females were positive for *Schistosoma haematobium* ova in their urine. Intensity of infection in both sexes increased with increase in prevalence and had similar pattern of decrease. Altogether, 34.9% males and 29.7% females has low egg counts below 50 eggs/10 ml urine while males (65.1%) and females (70.3%) had high eggs counts. Visible haematuria was seen in most positive urine specimens.

Keywords: *Schistosoma haematobium*, Urinary schistosomiasis, haematuria, cerceriae, *Bulinus* specie.

Accepted on March 30, 2017

Introduction

Schistosomiasis is a pathological condition resulting from infection by a digenetic trematode of the genus *Schistosoma*. Four species of this parasite infect man, include *S. mansoni*, *S. haematobium*, *S. japanicum* and S. intercalation. Except *S. japanicum*, all these species are endemic in varying degrees in different parts of Nigeria. However, *S. haematobium* is more widely distributed than the other species [1,2]. Man acquires the infection from fresh water habitats transmitted by specific aquatic snail intermediate hosts in the genera *Bulinus* which transmits *S. haematobium*. Urinary (vesical) schistosomiasis is caused by *S. haematobium* which deposits eggs in the vesicle plexuses of the bladder. Haematuria appears at the beginning of the infection. These damage the urinary tract and could result in cancer of the bladder Lewis et al. [3] anatomic infertility [4] as well as female genital schistosomiasis Anosike et al. [5]. It affects about 200 million people in 74 developing countries and between 500-600 million others are exposed to infection because of poverty, ignorance, poor housing, substandard hygienic practices and few, if any, sanitary facilities [6].

In Africa, *S. haematobium* is known to be transmitted by the planorbid snail *Bulinus* species including *B. globosus*, *B. africanus*, *B. nasatus* and *B. truncatus*. Both *B. forskali* Agi [7] and *B. senegalensis* have also been incriminated as intermediate host of *S. haematobium* [8]. In Nigeria, various studies have been carried out to show the prevalence and intensity of schistosomiasis amongst school children as well as adults in various states [9,10].

Research surveys show that schistosomiasis is a global problem with about 423 million people in need of treatment and so far 89 million have been treated Anosike et al. [5]. In African continent, Nigeria is the number one in need of treatment with praziquantel. Unfortunately, the endemicity level of urinary schistosomiasis currently in Nigeria has not been systematically mapped out to warrant mass chemotherapy. The present study is part of our effort to elucidate the prevalence of urinary schistosomiasis in Ohaukwu people of Ebonyi State, Nigeria.

Materials and Methods

The study area and population

The study was carried out between October 2002 and May 2003 in the nine communities of Ohaukwu Local Government Area in the South Western border of Ebonyi State Nigeria. Ebonyi state occupies the area lying between coordinates 7°31′ and 8°30′N and 5°40′ and 6°45′E. The area is typically rural settlement. The people settled in linear forms. Most of their thatched huts are randomly located near the market place. The inhabitants lack the basic social amenities such as light, pipe

borne water, electricity and good health centers in the rural areas. They depend mainly on ponds, rivers, streams and spring water for domestic use especially amongst rural dwellers. The climate of the area is tropical with a mean daily temperature of 30 ± 5°C for most of the year. The annual rainfall is between 214 and 240 cm with distinct wet and dry season. The vegetation is typically savannah. Water bodies like ponds, quarry ditches, streams, swamps, well and man-made lakes exist in this area. People have contacts with these snail infested water bodies through rice farming, bathing, swimming, washing of clothes, fetching of water, and fishing.

Without prior knowledge of the infested water bodies, most of the people use them to irrigate their rice farms thus highlighting penetration of *Schistosoma haematobium* cercariae into the body. Most drivers and cyclists stop over the pond sites to wash their vehicles and motorcycles respectively. Most people believe that haematuria due to the disease is the coming of age. While others associate it with sexually transmitted diseases.

Specimen collection and laboratory examination

The study organized and collected urine specimens from house to house. The specimens were collected between 10.00 and 14.00 hours using sterile plastic universal containers. Only those met in the house were included and no second visit was made. Respondents were interviewed individually about their age, sex, occupation and whether they have had/having bloody urine. The samples were sent to the laboratory within 6 hours of collection, where each specimen was thoroughly agitated [11]. 10 ml of urine were removed with a disposable syringe, transferred into a centrifuge tube and centrifuged for 5 minutes at 5000 rpm. After discarding the supernatant, the sediment was re-suspended in the remaining urine and poured into a Petri-dish for examination of eggs of *Schistosoma haematobium* under a binocular microscope. The eggs were counted and recorded. Chi-square is used to test for statistical significant difference in infection rates in relation to the villages, sex and age.

Results

The sex related prevalence of urinary schistosomiasis, is shown on Table 1. A total of 1, 215 (49.2%) persons consisting of 575 (52.2%) males and 640 (46.8%) females showed infection due to *S. haematobium*. The highest infection rate was recorded in females in Onuebeta 121 (59.9%) and males in Azuedena 81 (65.3%). The males however recorded a higher prevalence (52.2%) than the females (46.8%). Statistical analysis showed that there was significant difference among sexes (P<0.05).

Table 1. *Sex related prevalence of urinary schistosomiasis.*

					Total	
Villages	**No**	**No % of Males**	**No**	**No % of Females**	**No**	**Total No (%)**
	Examined Infected		**Examined**	**Infected**	**Examined**	**Infected**
Lukol	96	37 (38.5)	181	59 (32.6)	315	138 (43.8)
Onuebeta	151	82 (54.3)	202	121(59.9)	303	162(54.5)
Echem	104	44 (42.3)	179	68 (38.0)	404	213 (52.7)
Ameka	111	69 (62.2)	100	52 (52.0)	226	131 (57.9)
Ndiagumeka	177	95 (53.7)	162	92 (56.8)	311	125 (40.2)
Onuroro Effium	109	47 (43.1)	112	47 (42.0)	218	104 (47.7)
Amaewula	63	33 (52.4)	114	66 (57.9)	225	95 (42.2)
Azueelena	124	81 (65.3)	131	42 (32.2)	149	46 (30.9)
Ibenda	166	87 (52.4)	186	93 (50.3)	317	201 (63.4)
TOTAL	1101	575 (522)	1367	640 (46.8)	2,468	1,215 (49.2)

The sex, age and intensity related prevalence of urinary schistosomiasis in the study area is shown in Table 2, Of the 1,215 persons infected, 575 were males while 640 were females. The 6-10 age cohort had the highest prevalence rate of 60.3% among males and 58.0% was recorded among females. The highest intensity of 85.2 egg/10 ml urine was found in males while intensity of 62.3 egg/10 ml urine was found among females.

Both prevalence and intensity of infection in males and females were significantly higher in persons 1-25 years of age than in persons above 25 years (P<O.05). About 70.6% and 78.3% of males and female infected respectively were within the range of 0-25 years of age. In both sexes, persons under the age bracket of 0-15 years accounted for about 42.2% of the positive cases.

Table 2. *Sex related egg-count in Schistosoma haematobium infection in the study area.*

Age-Group	No Examined	No Males (%) Infected	Mean Egg/ 10 ml Of Urine	No Examined	No Females % Infected	Mean Egg/ 10 ml Of Urine
0-5	190	80 (42.1	62.5	230	49 (37.7)	60
10-Jun	281	90 (60.3)	85.2	300	195 (58.0)	62.3
15-Nov	164	70 (46.70)	59.3	230	105 (45.7)	60.5
16-20	140	92 (38.3)	69.5	190	89 (46.8)	56.1
21 -25	•h	74 (41.8)	52.3	138	63 (48.5)	43.8
26-30	65	43 (50.4)	49.1	130	57 (51.0)	37.9
31 -35	66	51 (53.1)	40.5	59	33 (55.9)	29.3
36-40	43	35 (55.6)	30.1	38	19 (50.0)	22.5
41 ^45	30	22 (58.0)	29.3	25	10 (44.0)	19.1
46-50	21	11 (26.8)	24	18	5 (27.8)	18.3
51 +	23	7 (25.9)	18.2	9	3 (22.2)	17.5

Generally, 48.2% of persons infected had egg counts less than 50egg/10 ml urine. In males, 34.9% of the infected persons had egg counts below 50egg/10 ml urine while majority (65.1%) had very high egg counts. This was also observed in females where 29.7% and 70.3% had low and high egg counts respectively (Table 3).

Table 3. *Sex related egg-count in Schistosoma haematobium infection in the study area.*

Egg Count	Male (%)	Female (%)	Total
Jan-49	200 (47.2)	190 (45.0)	390 (48.2)
50-99	92 (40.0)	88 (35.9)	180 (39.1)
100-149	76 (18.8)	84 (29.3)	160 (20.4)
150-199	65 (16.8)	79 (25.9)	144 (16.5)
200 - 249	59 (14.4)	64 (15.8)	123 (14.8)
250-299	40 (11.0)	59 (13.8)	99 (10.7)
300 - 349	30 (5.6)	48 (11.3)	78 (7.3)
350 - 399	10 (2.8)	11 (4.9)	29 (3.6)
400+	3 (1.2)	9 (3.1)	12 (1.8)
Total	575 (47.3)	640 (52.7)	1,215

Discussion

The results of this investigation showed that urinary schistosomiasis is endemic among the Ohaukwu people of'Ebonyi state, Nigeria. Prevalence rate of 49.2% was recorded. This can be related to low socio-economic standard and geography of the villages where the local water sources are used for several activities, such as washing, cooking, bathing, and for drinking purposes. This helps in the spread of the disease.

The higher prevalence of infection among the age group 16-20 could be attributed to the fact that most are teenagers and are always found swimming, washing and playing in the infested water bodies. These plausibly increase the chances of contacting the disease.

The prevalence of urinary schistosomiasis varied among villages. The highest prevalence rate was recorded at Ibenda village (63.4%). This could be attributed to frequent contact activities, which can lead them to these water bodies. Most of them are farmers who spend long periods working in waterlogged areas. This agrees with the findings of Anosike et al. [12,13]. They observed that after working, they wash their body in any nearby steam, allowing the penetration of the cercariae. This contributes to the high infection rate.

Infection in makes is higher than in females similar to the reports of Ogbe and Olojo [14], Udonsi [15] Ugbomoiko [16] in other endemic areas in Nigeria. It is due to the greater contact of males with contaminated water through long period of farming or other water-related activities while the females get infected through long period of washing and collection of water for domestic use.

Our observations showed that persons under 5-15 years age bracket were responsible for the transmission of *Schistosoma haematobium* having accounted for about 42.2% of the positive cases. The initial rise in prevalence with age-reaching the peak between 6-10 years age group, followed by a decline with increase in age observed herein is in agreement with the reports of Okpala (1961), Anigbo and Nwaorgu [17], Anosike et al. [8,13,18-21] Alozie and Anosike [12], Nwoke et al. [6], Nwosu et al. [10]. At early age, water contact activities are minimal. The activities increase with growth and maturity. Above the late teenage years (above 18 years) plausibly, the girls and boys make less contact with stagnant water pool, consequently lessening the chances of being infected with *schistosome cercariae*. The distribution of mean egg count by age also shows similar pattern, suggesting a heavy infection and risk of complication among the age group.

The drop in mean intensity for *Schistosoma haematobium* infection in the older age group could be attributed to either a decrease in transmission and fecundity of parasites already in the human host which is consistent with the slowly acquired immunity to parasitic infection or concomitant immunity in the case of schistosomiasis Ogbe [21]. Conversely, it could also be related to the fact that schistosomiasis is a chronic granulomatous disease [22]. With increasing host age of infection, eggs become trapped and calcified in the bladder, shrinking the bladder and reducing egg excretion. The older the duration of infection, the more calcification and bladder pathology as well as less the amount of egg excretion in the urine Anosike et. al. [12].

Based on the result of this study, urinary schistosomiasis has been recognized as an important public health problem in Ohaukwu L.G.A and calls of active intervention. This disease

is highly prevalent in the area and could be a threat to important socio-economic activities in the area. Contact with snail infested water bodies is known to encourage the transmission of the disease. Thus, there is need for the local government and state government and concerned organizations to establish control programmes in the local government area.

Mass chemotherapy using praziquantel is recommended that the whole local government area be demarcated into operational zones for ease of drug distribution and monitoring. The introduction of simple health education tips in the communities (use of proper knee high boots in rice farms) is also encouraged. The health education aspect of the control strategy should be emphasized from the onset in order to consolidate the results of chemotherapy. The control strategy should be integrated into the primary Health Care system to reduce cost and enhance effectiveness.

It is hoped that this programme will also be useful for other rural communities and will contribute to the advance of urinary schistosomiasis control in Ebonyi state and Nigeria as a whole (Figure 1).

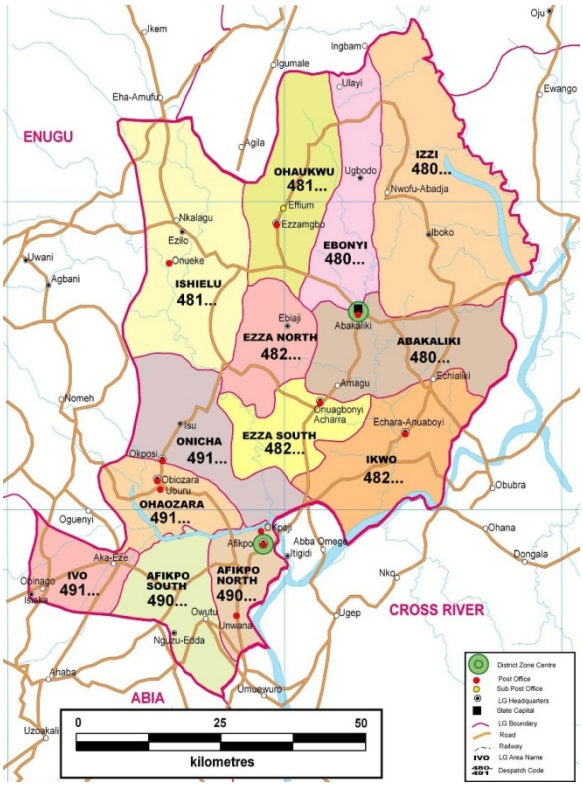

Figure 1. Schistosomiasis control in Ebonyi state and Nigeria.

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