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Current Status of Urinary Schistosomiasis and Some Pre-Disposing Factors in Emelego Community, Rivers State, Nigeria

A.E. Abah, H. Onoja, F.O. Nduka and F.O.I. Arene

Department of Animal and Environmental Biology, Faculty of Science,
University of Port Harcourt.PMB 5323 Port Harcourt 50001, Rivers State, Nigeria

Abstract: The aim of the study was to assess the current status and the level of awareness of urinary schistosomiasis in Emelego community, Rivers State, Nigeria using the standard method for examination of schistosomiasis. Prevalence of infection showed that out of the 350 urine samples examined, none was positive (Zero prevalence) for urinary schistosomiasis. Haematuria and proteinuria showed that those within the age range of 31-40years had more cases of Haematuria at 15(62.5%) while those within >51years had zero cases. The highest prevalence of proteinuria was within the age range 51-60 years with 3(100.0%) while the least case was recorded within the age 31-40 years with 9(37.5 %). There was a significant association ($P<0.05$) between age and prevalence of Haematuria and Proteinuria. Prevalence on the bases of sex showed there was a significant association ($P<0.05$) between sex and Haematuria and Proteinuria. The level of awareness of schistosomiasis between males and females showed that more males (23.08%) were aware than females (15.74%).However, the difference was not significant ($P>0.05$). In conclusion, schistosomiasis is no longer a threat to inhabitants of Emelego community of Abua/Odua Local Government Area of Rivers State.

Key words: Prevalence · Urinary Schistosomiasis · Infection · Awareness · Emelego Community · Nigeria

INTRODUCTION

Urinary Schistosomiasis is a disease caused by *Schistosoma haematobium* and is one among the common Neglected Tropical Diseases. It is estimated that 237million people are infected and another 600-779 are at risk of being infected worldwide [1-3]. In developing countries, it is the most important water-borne parasitic disease and presents greatest risk to health in the rural areas [4]. In 2011, out of the 78 countries living in areas of high risk for the disease, the African region was the most affected with 42 countries endemic for the infection [5]. The infection is acquired through contact with contaminated water by persons passing urine containing *S. haematobium* eggs into water which is used by others for bathing, washing, agricultural purposes, fishing or recreation [6]. The distribution of Schistosomiasis is sensitive to environmental changes and particularly environmental changes of human origin [7].

In Nigeria, it is wide spread and constitute public health problem particularly in children [8-10]. It is estimated that 11million Nigerians are infected with schistosomiasis especially in the dry northern areas where *S. haematobium* is focal and acquired in seasonal pools [11]. Urinary schistosomiasis is wide spread both in rural and urban communities in Nigeria with prevalence ranging between 2 and 90% and majority of cases occurring among the poor and marginalized [12-15].

In southern Nigeria, schistosomiasis infection has been reported in pre-school age children in settlements in Ogun State and Cross Rivers State [15, 16]. Little or nothing was known about schistosomiasis in the Niger Delta until late 1980's [17]. Studies on the prevalence of infection and snail bionomics confirmed that Oduain Niger Delta was hyper endemic with urinary schistosomiasis [18, 19].

Emelego community of Abua/Odual Local Government Area (LGA) of Rivers State was reported to have 58.2% prevalence rate of urinary schistosomiasis [20]. Agi and Awi-waadu [21] reported 51.9% prevalence in Anyu community, a neighbouring community to Emelego. Awi-waadu and Ezenwaka [22] observed 35.0%

Correesponding Author: A.E. Abah, Department of Animal and Environmental Biology, Faculty of Science, University of Port Harcourt, P.M.B. 5323 Port Harcourt 50001, Rivers State, Nigeria.
E-mail: austin.abah@uniport.edu.ng, aeabah@yahoo.com.

prevalence in both Odua and Obedum communities in Abua/Odua LGA. Elele and Ewurum [23] reported an overall prevalence of 17.8% in four communities (Amerikpoko, Anyu, Obedum and Odua) of Abua/Odual LGA of Rivers State. Based on theseearlier reports, several interventions ranging from supply of drugs by Non-Governmental Organizations such as Carter Center in conjunction with Government in Nigeria [24] to individual researchers giving health awareness talks have been carried out at different levels in the communities. Also, the provision of infrastructural facilities, the socioeconomic status and level of awareness within the community may have improved. The aim of this study was to ascertain the current status of urinary schistosomiasis and the pre-disposing factors in Emelego community, Rivers State, Nigeria.

MATERIALS AND METHODS

Ethical Clearance: Permission was sought and obtained from Rivers State Ministry of Health, the head chief and other chiefs were briefed and their consent sought and obtained. Community Development Committee and Individual consent were also obtained.

Study Area: Emelego community is in Abua/Odual Local Government Area of Rivers State. The village lies between latitude 6° 29'68"N and longitude 4°49'13"E. It is approximately 60km from Port Harcourt the capital city of Rivers State and has a broad coastal plain topography with so many ponds and streams. It has an annual Rainfall of about 3200mm average temperature of about28-30°C and high humidity throughout the year. The community is a typical rural community and lacks many basic facilities. The main socioeconomic activity of inhabitants is predominantly farming; main source of water is River, rain water and boreholes.

Sample Collection: Out of 374 randomly selected and instructed participants who were given bottles only 350 subjects aged within 4-55years old returned their bottles with urine samples. Each participant was given a wide mouth clean 20ml screw-capped sterile universal bottle to provide terminal urine between 10, 00hrs and 14, 00hrs. Each sample bottle was labeled to correspond to the persons on a predesigned epidemiological form. Structured questionnaires were administered to the participants to assess the level of their knowledge about schistosomiasis. The forms were filled by the participants while those who cannot read or write were assisted. The samples were preserved by adding 0.5ml of 10% formalin at the point of collection and transported to the Parasitology Research Laboratory of the Department of Animal and Environmental Biology, University of Port Harcourt.

Laboratory Analysis:

Macroscopic Examination: (Test for Haematuria and Protienuria): Urine samples were observed for any visible evidence of blood and turbidity. Haematuria and Proteinuria were assayed using the chemical reagent strip, Medi-test combi-9 made by Marcherey-NagelBatch No.PZN6181600.

Microscopic Examination: Urine samples were examined for the presence of *Schistosoma haematobium* eggs using the sedimentation technique. 10ml each of well mixed urine sample was poured into a graduated centrifuge tube and centrifuged at RCF 1000g for 3mins as described by Cheesbrough [25]. The supernatant was discarded and the sediment was transferred onto a clean glass slide and covered with cover slip and viewed under the light microscope using X10 and X40 objectives for identification of *Schistosoma haematobium* eggs and quantification was done by examining the entire field, counting the number of eggs and expressed as number of eggs/10ml of urine. The intensity was classified as light infection (Less than 50 eggs/10 ml of urine) and heavy infection (More than 50 eggs/10 ml of urine).

Staistical Analysis: Proportions obtained in the studywere analysed using percentage and descriptive statistics (Tables and Charts) and Chi square (X^2) analysis at 5% significant level. SPSS package was used.

RESULTS

The socio-demographic data (Table 1) showed that out of the total of 350 persons examined, 166 (47.4%) were males and 184 (52.6%) were females. participants within the age range of 11yrs – 20yrs where more with 171 (48.9%) followed by those in the age range of 1yr – 10yrs with 90 (25.7%) and the least were those in the age range of 51yrs -60yrs with 3 (0.9%). The Educational status of the respondents showed that those with secondary school level were higher with 20 (50.0%) followed by those with primary school at 12 (30.0%) while the least were those without formal education at 3 (7.5%). Those who depended on borehole and rain as their source of water were more at 23 (57.5%) followed by those that

depended on Borehole, Rain and river at 10 (25.0%) while the least were those that depended on borehole alone at 7 (17.5%). The major types of toilet before the last 10 years were River at 33 (82.5%) followed by pit 4 (10.0%) and others at 3 (7.5%). However, in the last 10years the types of toilet showed that water closet had the highest with 19 (47.5%) followed by pit at 9 (22.7%) while the least was river at 5 (12.5%). Also types of buildings before 10 years ago were mostly mud houses at 34 (85.0%) followed by block houses at 6 (15.0%) but since the last 10years the major type of buildings are; block houses 31 (77.5%) followed by mud houses at 9 (22.5%).

Prevalence of infection showed that out of the 350 urine samples examined, none was positive for urinary schistosomiasis. Blood in the urine otherwise known as Haematuria and protein in the urine (Proteinuria) assayed showed that participants within the age range of 31-40yrs had more cases of Haematuria at 15(62.5) followed by those in the age range of 21-30 yrswith 19(41.3%) while those within 51years and above had zero cases. The highest prevalence of proteinuria was recorded among those within the age range 51-60 years with 3(100.0%) which was followed by those within the age 1-10 years with 4 (80.0%) while the least case was recorded among those within the age 31-40 years with 9(37.5 %). There was a significant association ($P<0.05$) between age and prevalence of Haematuria and Proteinuria (Table 2). Also relating the prevalence of Haematuria and Proteinuria with the sex of the study population (Table 3) revealed that more females had both haematuria 38 (20.7%) and proteinuria 53(28.8%) than males haematuria 7(4.2%) and proteinuria 35(21.1%). There was a significant association ($P<0.05$) between sex and prevalence of Haematuria and Proteinuria. The level of awareness of schistosomiasis between males and females showed that more males (23.08%) were aware than females (15.74%) (Table 4). However, the difference was not significant ($P>0.05$).

Result of the respondents showed a considerable improvement in living standard from the past and the level of awareness within the inhabitants of Emelego community. In the past 85.0% of the respondents lived in mud houses, only 15.0% lived in block houses but now 77.5% live in block houses against 22.5% that live in mud houses. Before now, 5(12.5%) used pit latrine; 32 (80.0%) defecated into rivers, while 3(7.5%) used other means. As at today, 20(50.0%) use water closet toilet; 10(25.0%) use pit latrine;8(20.0%) defecate in the bush and 2(5.0%) use river.

Table 1: Socio-demographic Characteristics of Emelego community

Sex	Respondents	Percentage
Males	166	47.4
Females	184	52.6
Age group in years		
1yr-10yr	90	25.7
11yr-20yr	171	48.9
21yr-30yr	56	16.0
31yr-40yr	20	5.7
41yr-50yr	10	2.9
51-60yr	3	0.9
61yr and above	0	0
Response from 40 respondents.		
Level of Education		
Primary	12	30.0
Secondary	20	50.0
Tertiary	5	12.5
No formal education	3	7.5
Major source of water		
Borehole only	7	17.5
Borehole and rain	23	57.5
Borehole, Rain and River	10	25.0
Type of toilet before thelast 10 years		
River	33	82.5
Pit	4	10.0
Others	3	7.5
Type of toilet since the last 10 years		
Water closet	19	47.5
Pit	9	22.7
Bush	7	17.5
River	5	12.5
Type building before 10yrs ago		
Block house	6	15.0
Mud house	34	85.0
Type of building since 10 years ago		
Block house	31	77.5
Mud house	9	22.5

All respondents agreed to eating snails. However, from the description of the kind of snails they ate which was either bought from the market/or picked from the bush and their responses to the snail specimens shown to them revealed that the snails within the community were not snail vector of *S.haematobium*. All respondents accepted that they had received enlightenment from health workers on how to prevent infections and diseases such as malaria, schistosomiasis and guinea worm infections. They also disclosed that they had received insecticide-treated bet nets, artesunate and deworming tablets from health workers. The respondents revealed that their water bodies had not been treated. However, it was observed that most of the water bodies visited had layer of oil film on their surfaces.

Table 2: Association of age with prevalence of Haematuria and Proteinuria in Emelego community

		Schistosomiasis				
Age	Haematuria(%)	Proteinuria(%)	Total	Pearson Chi-Square	Df	Asymp.sig. (2-sided)
A ge 1-10	1(20.0)	4(80.0)	5			
Age 11-20	8(17.0)	39(82.9)	47			
Age21-30	19(41.3)	27(58.7)	46			
Age 31-40	15(62.5)	9(37.5)	24	18.131[a]	5	0.003
Age 41-50	2(25.0)	6(75.0)	8			
Age 51-60	0	3(100.0)	3			
Total	45(33.8)	88(66.2)	133			

Chi-value.

There was significant association between age and prevalence of Haematuria and Proteinuria at P<0.05.

Table 3: Association of sex with prevalence of Haematuria and Protienuria in Emelego community

		Schistosomiasis					
	No. Examined	Haematuria(%)	Proteinuria(%)	Total(%)	Pearson Chi-Square	Df	Asymp.sig. (2-sided)
Sex. Male	166	7(4.2)	35(21.1)	42(25.2)			
Female	184	38(20.7)	53(28.8)	91(49.5)	8.082	1	0.004
Total	350	45(12.9)	88(25.1)	133(38.0)			

Chi-value

There was significant association between the sex and prevalence of Haematuria and proteinuria at P<0.05.

Table 4: Knowledge, attitude and practice of urinary schistosomiasis among respondents inEmelego community

		Awareness				
	Aware	Not- Aware	Total	Pearson Chi-Square	Df	Asymp.sig. (2-sided)
Sex. Male	36(23.08%)	56	92			
Female	23(15.74%)	41	64	0.164	1	0.686
Total	59(38.82%)	97	156			

Chi-Value.

There was no significant association between sex and Knowledge, attitude and Practice about the prevalence of urinary schistosomiasis at P>0.05.

DISCUSSION

Present study recorded zero percent prevalence of *Schistosomahaematobium* in Emelego community of Abua/Odual Local Government Area of Rivers State. This result is at variance with 58.2% prevalence reported by Arene and Asor [20] in the same community and 51.9% prevalence reported in Anyu community, a neighbouring community by Agi and Awi-waadu and Ezenwaka [22]. The zero percent is also at variance with other earlier reports from elsewhere in the same Local Government. For example, Awi-waadu and Ezenwaka [22] had reported 35% prevalence in both Odua and Obedum communities in Abua/Odua LGA and Elele and Ewurum [23] also reported an overall prevalence of 17.82% in four communities (Amerikpoko, Anyu, Obedum and Odua) of Abua/Odual LGA of Rivers State. However, we observed that since the first reported case [20] of *Schistosoma haematobium* in Emelego community there was a steady decline of prevalence as seen from the subsequent reports from nearby communities stated abovewhich finally got to zero prevalence recorded in this study. The elimination of schistosomiasis infection in Emelego community may have been achieved as a result of various intervention programmes. Since after the first reported case, Individuals, Non-Governmental Organizations and Government agencies have been involved in the fight against the infections via sensitizations, health education and drug administrations as evident in interactions we had with the respondents in the community. For example, the World Health Organization, Merck KGaA(Germany) and many additional partners made possible the delivery of more than 10million praziquantel treatments by Carter Center in Nigeria since 1999. The Carter Center assisted the Nigeria Ministry of Health to provide Health Education and drugs to treat schistosomiasis in six states where the burden of the disease is greatest including part of Niger Delta [24] where Emelego and the neighbouring communities in Abua/Odua were targets. Also individuals researching on Schistosomiasis provided enlightenment,

health education and awareness. Because there is no vaccine for the control of this disease, it took over a decade and half of concerted efforts targeted at this desired result for it to be achieved.

It was observed that the level of infrastructural development had improved considerably in the last 10years within Emelego community and this, according to the respondents had led to considerable improvement in living standard from the past. Two boreholes were provided; more persons now have their source of drinking water (57.5%) and water for recreation (47.5%) as bore-hole/tap water. This has greatly reduced the number of persons that go to the water bodies and make contact with it since infection with *Schistosoma haematobium* is acquired through contact with infected water bodies for recreation and other uses [6]. Before now, 5(12.5%) used pit latrine; 32 (80.0%) defecated into rivers, while 3(7.5%) used other means. As at today, 20(50.0%) use water closet toilet; 10(25.0%) use pit latrine; 8 (20.0%) defecate in the bush and 2(5.0%) use river. The improvement of infrastructural facilities may have helped in the elimination of Schistosomiasis in Emelego community and this seems to agree with the control strategy used in Ghana where *Schistosoma haematobium* infection was effectively controlled in Ghanaian community following installation of a water recreation area [26]. Haematuria and Proteinuria are common features in urinary schistosomiasis infection. However, it is not only schistosomiasis infections that show haematuria and proteinuria in urine. They could be seen in other pathological issues and since zero prevalence of schistosomiasis is recorded in this study, one of such issues may have been responsible especially in women where menstrual cycle shows positive for haematuria.

From the respondents, Knowledge/Awareness about schistosomiasis was 38.8%which we believed was still low, considering the fact that the first reported case of Schistosomiasis in the community was over a decade ago [20]. This presupposes that if there were active cases, transmission would have continued with little hindrance because it has been established that community's level of knowledge, their attitude and their practices are factors that majorly encourage transmission of Schistosomiasis [30] more so, the infrastructural development of the place has greatly improved and other obvious intervention measures like the sensitization and health education. We considered it worrisome too because we found out that over 50% of the respondents had at least secondary school education and level of education defines socio-economic status and it is a known fact had that people with higher socio-economic status are more aware and more frequently sought health care and visited health facilities than people with low socio-economic status [31]. This low awareness can be a subject for further study because in every environment, there exist predisposing and enabling factors that influence people to behave in a particular way [32].

In conclusion, there has been a renewed commitment to global parasite control. The zero prevalence recorded in this study is the desired result and from the result obtained, schistosomiasis is no longer a threat to inhabitants of Emelego community of Abua/Odua Local Government Area of Rivers State. Improved infrastructure, drug administrations, public awareness and all the sustained combined efforts succeeded in the present elimination of schistosomiasis in Emelego community.

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