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Full length Research Article

High Prevalence of Urinary Schistosomiasis in a Nigerian Community

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ABSTRACT: The prevalence of urinary schistosomiasis in Ogbadibo Local Government Area, Benue State, Nigeria was investigated. Out of 657 urine samples examined, 300 (46.6%) showed the presence of *Schistosoma haematobium*. Of the 300 positive samples, 152 (23.13%) were from males and 148 (22.52%) were from females. Owukpa and Eha zones showed higher prevalence 10.8% and 10.35% respectively than the other three zones. Statistical analysis showed that the prevalence of the disease in the study is neither sex, nor age dependent, hence there was no observed significant difference ($p>0.05$), though the age group 11-20 years (9.56%) has a slightly higher prevalence than other age groups. There was a close relationship between haematuria and positive urine samples. The presence of many snail species especially the *Bulinus* species, and increased contact time with the *Schistosoma haematobium* infested freshwater habitat were thought to be responsible for the prevalence of the disease in the area.

KEYWORDS: *Prevalence, Urinary Schistosomiasis.*

INTRODUCTION

Schistosomiasis also known as Bilharziasis remains one of the most prevalent parasitic worm infections and has significant economic and public health consequences. It affects many countries and appears to be endemic in many West African countries. It is mostly common in the tropical areas of the globe especially the rural areas where only the surface water bodies are the sources of water supply.

The knowledge of how intestinal parasites pass from person to person is known and variously documented (Scott *et al.*, 1982; Udonsi, 1990), and modern drugs are available, providing powerful weapons against them. Nevertheless, these infections continued to be a widespread problem and although their impact on an individual may seem slight, the global burden of the parasitic worm infections is a major health care challenge (WHO, 1987). The capacity of man to combat intestinal parasite does not seem to fall down in diagnosis and treatment, rather, it is in the low priority accorded to the control of the parasitic diseases by government of where they are endemic.

The World Health Organization state that the control of schistosomiasis has to be an integrated effort which includes methodologies and managerial tools to improve preventive strategies, and emphasizes health education, information and communication (WHO, 1993; 1995).

Incidence of schistosomiasis in Nigeria and surveys reporting the prevalence in some towns and communities has been documented (Cowpear, 1973; Ozumba *et al.*, 1989; Adewumi *et al.*, 1990; Emejulu *et*

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al., 1994; Edungbola *et al.,* 1998; Adeyeba and Ojeaga, 2002). The prevalence reported in some of these earlier studies varies from 32% to 98%. Some of the reports indicated that the disease is found mostly among school children and transmission is usually focal (Adeyeba and Ojeaga, 2002) - that is to say that the geographical distribution of the infection and of severe morbidity is restricted to a particular place. Many studies also point out that a lot of work will still had to be done to discover new endemic areas and to harness the predictive potential of schistosomiasis indicators to arrive at a cheaper community diagnosis and preventive protocols.

The objective of this study was to determine the prevalence and endemicity of urinary schistosomiasis in Ogbadibo Local Government Area of Benue State, North central Nigeria, as there is no previous data available in this area.

MATERIALS AND METHODS

The study was conducted in Ogbadibo Local Governemnt Area, Benue State, North central Nigeria. The Local Government was divided into five zones for effective coverage. The zones include Aiona, Owukpa, Eha, Ijadoga and Otukpa. Winners Hospital Aiona, St' Theresa Hospital Owukpa, F.S.P. Clinic Eha, Comprehensive Health Centre Ijadoya and the General Hospital Otukpa were the health institutions used to collect urine samples from patients. The health institutions approved the procedures for sample collection. The information on age, sex and source of water supplies was obtained from the patients.

A total of 657 urine samples comprising 329 samples from males and 328 samples from females were collected and examined from May 2004 to July 2006. The urine samples were collected in 50ml universal sample bottles between 10am and 2pm (WHO, 2003) and taken to the laboratory where they were analyzed. The presence of visible haematuria in any sample was noted and recorded. The centrifugations and sedimentation techniques (WHO, 1991) was employed to analyze the samples. 10ml urine was taken from the deposit of each specimen bottle after allowing to sediment for about 1hour and centrifuged for 2mins at 2000rpm. The deposit was thereafter examined microscopically using X10 and X40 objectives for the characteristics Schistosoma egg or ova.

The freshwater habitats in all the zones were visited and snail search was conducted in each of them. Snails found were picked and put in wide mouth plastic buckets and taken to the laboratory where they were screened for *Cercariae* after exposure to sunlight for about 3hours (Emejulu *et al.,* 1994).

Statistical analysis was carried out using the chi-square test.

RESULT

The prevalence of urinary schistosomiasis in different zones in Ogbadibo Local Government of Benue State is presented in Table 1. The result shows that of a total of 657 urine samples examined, 300 (45.6%) showed the presence of *Schistosoma haematobium* eggs. Owukpa and Eha zones showed higher prevalence (10.8% and 10.35% respectively) than other zones. The prevalence of the infection in relation to sex is also shown in Fig 1 and there was no observed significant difference in infection among the sexes ($p>0.05$). The result shows that of 329 male urine samples examined, 152 (23.13%) showed the presence of *S. haematobium* eggs while 148 out of 328 (22.53%) female urine samples examined contained the eggs.

Table 1: Prevalence of Urinary Schistosomiasis in different zones in Ogbadibo L.G.A. Benue State.

Zones	*No. examined*			*No. infected*			*% infected*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Aiona	65	60	125	33	30	63	5.02	4.57	**9.59**
Otukpa	72	78	150	25	23	48	3.81	3.50	**7.31**
Eha	55	50	105	35	33	68	5.33	5.02	**10.35**
Ijadoga	67	68	135	25	25	50	3.81	3.81	**7.62**
Owukpa	70	72	142	34	37	71	5.18	5.63	**10.81**
Total	**329**	**328**	**657**	**152**	**148**	**300**	**23.05**[a]	**21.53**[b]	**45.66**

Values with different superscripts in the same row are not significantly different ($p>0.05$).

Table 2:
Age Distribution of Schistosomiasis in Ogbadibo L.G.A. of Benue State

Age groups (yrs)	***Zones No. examined***					
	Aiona	***Otukpa***	***Eha***	***Ijadoga***	***Owukpa***	***Total***
0-10	18	23	20	24	33	118
11-20	30	28	27	31	35	151
21-30	23	30	19	24	25	121
31-40	26	35	23	29	23	136
>40	28	34	16	27	26	131
Total	125	150	105	135	142	657
Age groups (yrs)	***Zones No. infected (%)***					
	Aiona	***Otukpa***	***Eha***	***Ijadoga***	***Owukpa***	***Total***
0-10	10 (1.52)	8 (1.21)	13 (1.98)	11 (1.67)	19 (2.89)	**61 (9.27)$**
11-20	17 (2.59)	9 (1.36)	12 (1.82)	9 (1.36)	16 (2.43)	**64 (9.56)$**
21-30	15 (2.28)	15 (2.28)	14 (2.13)	7 (1.06)	10 (1.52)	**61 (9.27)$**
31-40	9 (1.36)	9 (1.36)	17 (2.59)	8 (1.21)	14 (2.13)	**57 (8.65)$**
>40	12 (1.82)	7 (1.06)	11 (1.67)	15 (2.28)	12 (1.82)	**57 (8.65)$**
Total	**63 (9.58)**	**48 (7.3)**	**67 (10.19)**	**50 (7.61)**	**72 (10.96)**	**300 (45.6)**

Values with superscripts in dollar sign ($) are not significantly different (p>0.05).

The prevalence rate of the disease with respect to age is shown in Table 2. The result shows that the infection rate uniquely cut across all the age brackets studied although the age bracket 11-20 years retained more infection than the other age groups but still there was no observed significant difference in infection among the age groups (p>0.05). The survey of freshwater habitat resulted in collection of many snails and many of them yielded schistosoma cercariae. Many of the snail species were identified as *Bulinus* species known to be intermediate hosts for *Schistosoma haematobium*. The analysis of the haematuria samples showed that majority of the urine samples with blood stains contained *Schistosoma haematobium* eggs.

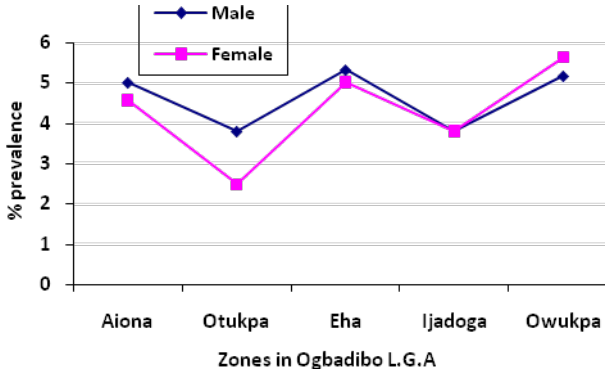

Fig 1: Frequency of infection among the sexes in the different zones

DISCUSSION

The global problem of tropical diseases has continued to grow over the years against wide spread optimism that prevailed in the 1950s among those working in the field of public health that tropical diseases including schistosomiasis would soon be things of the past. The result of this study showed a relatively high prevalence of urinary schistosomiasis (45.68%) in Ogbadibo Local Government Area of Benue State, Nigeria and therefore falls into the World Health Organization classification as endemic (WHO, 2002). This prevalence is however lower than 66.4% and 76.2% reported by Adewumi *et al* (1991) in three contiguous communities in South West Nigeria. Adeyeba and Ojeaga, (2002) reported a close infection rate of 57.5% among school children in Ibadan Nigeria. Edungbola *et al*, (1998) recorded similar infection rate among school children in Babana district, Kwara State, Nigeria.

The result of this study unlike the result of some earlier studies shows that the prevalence of the disease is not age dependent even though there was a slight increase in the prevalence rate among the age bracket of 11-20 yrs (Table 2). The statistical analysis showed that neither sex nor age had significant influence in the prevalence of the disease in the area (p> 0.05). There was no sharp difference between the rate of the infection between the males 23.13% and the females 22.53% (Table 1). This is presumably due to equal

exposure to the risk factor as there were no restrictions on movement and contact with the freshwater habitat in terms of culture, religion, sex or age. The people were seen engaged in activities that necessitate more contact times with the streams and snail intermediate vectors. Every segment of the inhabitants of the communities were observed to be making use of the streams, either for washing, fetching water, swimming, fishing, bathing or hunting for snails by the edges and fringes of the streams. The villagers eat and sell the caught snails at the village markets to even people from other parts of the country, especially those from the eastern part. The availability of various species of snails especially the *Bulinus* species highlights the endemicity of the disease in the area. The fact that increased contact time with *Schistosoma haematobium* infested habitat increases the rate and endemicity of schistosomiasis has variously been reported (Ilyde, 1984; Chandiwana, 1987; Udonsi,1990; Emejulu *et al.,* 1994 ; Naji *et al.,* 1999). The slightly higher prevalence rate (9.56%) observed among the age bracket 11-20 years is expected as that is the age that appears to be more adventurous in terms of hunting for snails, and fishing.

The sub-urban settlement of Otukpa and Ijadoga within the local government headquarters have little advantage over other zones because they have government water works that supply them pipe borne water even though the supply is grossly inadequate. They still depend on streams, hand dug wells and springs for supplemental supply. This may explain why the two zones have lesser prevalence (7.3% and 7.6% respectively) than the rest of the zones (Table 1). The communities within the Owukpa and Eha zones are more remote with streams and hand dug wells as their sole source of water supply. The inhabitants have higher contact times with the schistosoma infested habitats. This can explain the higher prevalence rate (10.8% and 10.35% respectively) recorded in the two zones (Table 1).

The observation in this study that many of the urine samples with blood stains contained *Schistosoma haematobium* eggs is in line with observations of Emejulu *et al* (1994) and that of Adeyeba and Ojeaga, (2002). Emejulu *et al* (1994) however noted that the result of analysis of visible haematuria shows that it is highly sensitive as a diagnostic tool but has a very low positive predictive value because of its low specificity in many of the studied areas.

It is crucial to note that in most part of Nigeria especially the North central region, the epidemiology of urinary schistosomiasis is partially known and this is probably the first study recorded on the prevalence and endemicity of urinary schistosomiasis in Ogbadibo Local Government of Benue State, North central Nigeria. It is recommended that any urinary schistosomiasis control program in Benue State should include the current study area.

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