GLOBAL JOURNAL OF MEDICAL SCIENCES VOL. 2, NO. 1, 2003. 19 - 22
COPYRIGHT(C) BACHUDO SCIENCE CO. LTD. ISSN 1596 - 2911. PRINTED IN NIGERIA

DISTRIBUTION OF URINARY SCHISTOSOMIASIS AMONG HIGH SCHOOL STUDENTS IN UTUKWANG, OBUDU, CROSS RIVER STATE OF NIGERIA

O. E. OKON and N. UMECHE

(Received 24 March 2002; Revision accepted 2 August 2002)

ABSTRACT

Investigation on the 200 high school children in Otukwang community, Obudu, Cross River State, Nigeria showed an overall prevalence of 91% with peak prevalence in children between 9-12 years old. There was a higher intensity of infection in females than males (t-test, $P < 0.05$) in Otukwang community. Mean haematuria was found to correlate positively with the mean ova/10ml of urine. In general, factors responsible for infection included absence of pipe-borne water, presence of infected *Bulinus globosus* in freshwater bodies and frequent contact of children with cercaria infected waters.

Key words: Urinary Schistosomiasis, Distribution, Students, Otukwang community, Cross River State.

INTRODUCTION

Schistosomiasis is a water borne trematode infection which has been classified as the second most important parasitic disease, with over 200 million people being infected in 74 countries World-wide (Remme et al, 1993). Urinary Schistosomiasis is caused by *Schistosoma haematobium* and transmitted to man by freshwater snail of *Bulinus* species. In Nigeria, review of literature revealed wide distribution of the disease with numerous endemic foci particularly in rural riverine areas where infection rate as high as 90% have been recorded (Cowper, 1973). Research evidence indicate that the disease may be increasing in prevalence and importance particularly in remote poorly accessible rural communities (Adewumi et al, 1993, Amole & Jinadu 1994 and Egwunyenga et al 1994). Although there has been important local success in the control of Schistosomiasis in Nigeria, but at the global level, the infection has increased over the years (WHO, 1993).

Some recent reports of urinary Schistosomiasis in Nigeria include those of Etim et al (1998), Tukur & Galadima (1998), Abolarinwa (1999), Ekejindu et al (1999), Ugbomoiko et al (2000), Dunah & Bristone (2000).

The objective of this research was to study the distribution of urinary Schistosomiasis among high school students, Otukwang community, Obudu, Cross River State, Nigeria.

MATERIALS AND METHODS

Study Area

Obudu community is a rural settlement situated about 322km from Calabar Urban, the capital of Cross River state of Nigeria. Alege Community Secondary School, Otukwang in Obudu was chosen for the investigation because it represents at least a cross section of the Obudu community. Subsistence farming is the major occupation of the inhabitants of

O. E. OKON, Department of Zoology, University of Calabar, Calabar - Nigeria
N. UMECHE, Department of Applied Biology, Ebonyi State University - Nigeria

this community. There is no potable water supply in this community; hence inhabitants depend on nearby streams as their main source of water supply.

Data Collection

Labelled graduated cups were used to collect terminal urine between 11.00 and 14.00 hours from the students (Pugh, 1979). Selection of the 200 students were randomized for both age and sex with representatives from different classes. Samples were collected from December 2000 to March 2001.

Urinalysis was carried out on the freshly void urine sample using a medi-test combi-9 (Macherey-Nagel, D-5160 Duren) reagent strips to measure the haematuria level in urine.

After urinalysis, 10ml of urine was preserved in two drops of hydrochloric acid and four drops of commercial bleach (Sodium Hypochlorite) (WHO, 1990). Then, 10ml of the treated urine was centrifuged using Hettich Universal II Model Centrifuge at 1000rpm for five minutes. The supernatant was decanted leaving the deposit at the bottom of the tube. To view the deposits, it was aspirated and blown out three times to make it homogeneous before drawing it out finally with the pipette. The deposits were viewed under the compound microscope with x 10 objective. A tally counter was used to count the eggs as the microscopic field was moved. The total number of eggs found in each 10ml of urine specimens were recorded (WHO, 1990).

Student t test analysis was used to determine any significant difference in the mean ova/10ml of urine between male and female students in Otukwang ($P < 0.05$).

RESULTS

The 200 urine samples examined from Obudu indicated 182 (91%) overall prevalence. The peak prevalence of 100% was reported in children between 9-12 years old. The highest intensity of infection of 169.50 mean ova/10ml of urine was excreted by females between 17-20 years while males in the same age range had the highest egg output of 81.73 mean ova/ml of urine (Table 1).

Statistically, the intensity of infection in Obudu showed significant difference in mean ova per 10ml of urine between males and females (t-test, $P < 0.05$). The result also showed that as the mean haematuria increase, there was also a proportional increase in the mean ova/10ml of urine. (Table 2).

DISCUSSION

Studies on the distribution of urinary Schistosomiasis in Otukwang community, Obudu, Cross River state was carried out between December 2000 to March 2001. This

Table 1: Prevalence and Morbidity of *S haematobium* amongst the study population -- Otukwang Community, Obudu, Nigeria

Age Range	No. Examined		No. Infected		% Prevalence		Mean haematuria (Ery/µl)		Mean ova/10ml	
	M	F	M	F	M	F	M	F	M	F
9 – 12	38	16	38	16	100	100	140	94.38	77.37	48.75
13 – 16	74	30	68	22	91.89	73.33	90.97	190	38.71	55.64
17 – 20	30	12	30	8	100	66.67	161.33	188.75	81.73	169.5
TOTAL	142	58	136	46	95.78	79.31	130.77	157.71	65.94	91.29

Table 2: Age range, Prevalence, mean haematuria and mean ova/10ml amongst the study population – Otukwang community. Obudu. Nigeria

Age Range (Yrs)	No. of Individuals Examined	No. +ve for *S. haematuria*	% Prevalence	No. +ve for haematuria	Mean haematuria Ery/µl	Mean ova/10ml
9 – 12	54	54	100.00	52	130.09	84.48
13 – 16	104	90	86.54	82	130.83	66.67
17 – 20	42	38	90.48	38	184.53	109.38
Total	200	182	91.00	172	148.48	86.84

research revealed an overall prevalence rate of urinary Schistosomiasis to be 91% among the 200 school children examined. In related studies, Etim et al (1998) found 35.95% overall prevalence among 840 persons in Biase community, Cross River state while Abolarinwa (1999) found 30.6% overall prevalence among 624 school children examined in Esie community. Kwara state, Nigeria. In another investigation, Arene and Asor (1999), found 58.2% out of 930 persons examined in Emelego community, Rivers state, Nigeria. In our studies, urinary Schistosomiasis was found to be very high in Otukwang community. The prevalence of this infection in some areas in the Northern state of Nigeria (Katsina, Kano, Sokoto, Kaduna, Argungu) could be as high as 95% (Cowper, 1963).

In the rural settlements in Nigeria, children constitute a great number of the whole population and are generally important reservoirs of infection urinating indiscriminately in or near freshwaters and irrigation schemes. In our studies, peak prevalence was found mainly in children 9 – 11 years old. In other parts of the country, peak prevalence were variously reported between 12-17 years (Arene & Asor, 1999), 8 – 13 years (Dunah & Bristone, 2000), 10 – 12 years (Tukur & Galadima, 1998) and so on. In general, children play a pivotal role in the dissemination of infection as a result of their association with water bodies. They were found to spend more time in water either washing, fishing, swimming or playing; hence, they were more exposed to infection.

There was a higher intensity of infection in females than males in our studies. That is, there was significant difference in mean ova/10ml of urine between the male and female subjects in Otukwang community, Obudu, Cross River State (t-test, $P < 0.05$). In most rural settlements in Nigeria, more females were involved in household chores requiring water. Since streams were their major source of water, there was increased frequency of contact of females with cercaria – infested waters. This was the probable reason why the intensity was higher in females than males in our studies. Conversely, in other studies, Abolarinwa (1999), Etim et al (1998) found a higher intensity in males than females. They attributed that to a greater tendency for males to swim, play and engage in other activities in the rivers and streams besides the primary household chores mostly executed by women.

Urinary Schistosomiasis is thus highly prevalent in most rural settlements in Nigeria and could be a threat to socio-economic development in all the infected areas. In general, integrated control should be considered in the complete elimination of

urinary schistosomiasis. This involves the provision of pipe-borne water to discourage total dependence on freshwater bodies as exclusive sources of water supply. Intensive health education on the adverse effects of indiscriminate urination into water bodies by infested persons. Reduction in water-contact among inhabitants of rural areas should also be encouraged to reduce contact with cercaria infected water. Chemical treatment of freshwater bodies with molluscicides to eliminate snail intermediate host is also imperative. In conclusion, appropriate Federal Government Agencies should intervene by adopting the integrated control measures in the total eradication of this scourge in all the rural settlements in Nigeria in general and in Otukwang community, Obudu, Cross River State in particular.

ACKNOWLEDGEMENT

We express our sincere gratitude to the Principal and Teachers of the Alege Community Secondary School, Otukwang, Obudu, Cross River State, Nigeria who encouraged their students to donate samples for this research to be carried out.

REFERENCES

Abolarinwa, S. O., 1999. Urinary Schistosomiasis among School Children in Esie Community, Kwara State, Nigeria Nig. J. Parasitol. 20: 77-82.

Adewumi, C. O., Gebremedhin, G., Becker, W., Olorunmola, F. O., Doetler, G. and Adewumi, T. A., 1993. Schistosomiasis and Intestinal parasites in rural villages in South-West Nigeria: An indication for expanded programme on drug distribution and integrated control programme Trop. Med. Parasitol., 44(3): 177-180.

Amole, B. O. and Jinadu, M. K., 1994. Urinary Schistosomiasis among school children in Ile Ife, Nigeria. Afr. J. Med & Med. Sci.: 23 (3): 249-252.

Arene, F. O. and Asor, J. E., 1999. Prevalence and Intensity of *Schistosoma haematobium* infection in Emelego community in the Niger Delta, Nigeria. Global J. Pure & Appl. Sci. 5(3): 323-326.

Cowper, S. G. 1963. Schistosomiasis in Nigeria. Ann. Trop Med. Parasitol. 57: 307 – 332.

Cowper, S. G. 1973. Bilharziasis (Schistosomiasis) in Nigeria. A Review. Trop. Geog. Med., 25: 105-118

Dunah, C. S. and Bristone, B. 2000. The Prevalence of *Schistosoma haematobium* among Primary School Pupils in Mayo-Belwa Local Government Area of Adamawa State, Nigeria. Nig. J. Parasitol., 21: 15-20.

Egwunyenga, O. A., Nmorsi, P. and Omokaiye, O. O. 1994 Schistosomiasis in Bauchi State, Nigeria. Nig. J Parasitol. 15: 35-41.

Ekejindu, I. M., Onyali, I. O., Ozumba, N. A. and Ibe, C. C., 1999. Prevalence and Intensity of Urinary Schistosomiasis in Agulu, Anambra State, Nigeria and the impact of health Education on knowledge and practices in relation to disease transmission. Nig. J. Parasitol., 20: 71-76.

Etim, S. E., Braide, E. I., Umeche, N. and Akpan, P. A., 1998. The epidemiology of Urinary Schistosomiasis in Biase area of Cross River State, Nigeria and its implications for control. Nig. J. Parasitol., 19: 77-83.

Pugh, R. N. H., 1979: Periodicity of output of *Schistosoma haematobium* eggs in the urine. Ann. Trop. Med. Parasitol., 73: 89 – 90.

Remme, J. H., Raadt, De P. and Gobal, T., 1993. The burden of Tropical disease. Med. J. Australia., 157: 465 – 469.

Tukur, A. and Galadima, M. 1998. Epidemiological studies of Schistosomiasis in the Bakolori irrigation project area of Zamfara State, Nigeria. Nig. J. Parasitol., 19. 73 –75.

Ugbomoiko, U. S., 2000. The Prevalence, incidence and distribution of human Urinary Schistosomiasis in Edo State, Nigeria. Nig. J. Parasitol., 21: 3 – 14.

W. H. O., 1990. Basic Technical index selected for health laboratory centers in the African region of W. H. O. (AFRO): Peoples' Republic of the Congo, Teleger, Unisate, Brazzaville, 580pp.

W. H. O. 1993. The Control of Schistosomiasis. Technical Report series No. 830.