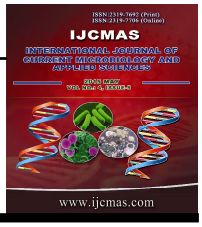
Int.J.Curr.Microbiol.App.Sci (2015) 4(5): 1151-1157

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 5 (2015) pp. 1151-1157**
http://www.ijcmas.com



Original Research Article

Prevalence of Urinary Schistosomiasis Infection among Primary School Pupils in Ezza-North Local Government Area of Ebonyi State

Nwosu, D.C.[1], Obeagu, Emmanuel Ifeanyi[2], Ozims, S.J.[3], Ezeama, M.C.[4] and Uduji, H.I.[1]

[1]Department of Medical Laboratory Science,Faculty of Health Sciences, Imo State University, Owerri, Nigeria.
[2]Diagnostic Laboratory Unit,University Health Services,Michael Opkara University of Agriculture, Umudike, Abia State, Nigeria
Department of Nursing Science, Imo State University, Owerri, Nigeria
[3]Department of Public Health,Imo State University, Owerri, Nigeria.
[4]Department of Nursing Science,Imo State University, Owerri, Nigeria
**Corresponding author*

Keywords

Urinary Schistosomiasis, *Schistosoma haematobium*, Urine samples

A B S T R A C T

Prevalence of urinary schistosomiasis in apparently healthy school pupils in Ezza-North Local Government Area was studied. Three hundred and twenty five (325) samples of urine were analysed.Ordinary centrifugal sedimentation technique was used and the deposits were examined microscopically. Out of the 325 urine samples analysed, 57 were found to be positive for *Schistosoma haematobium* giving a prevalence of 17.5%. Analysis of the result from the schools studied showed that 30 out of 120 from Ogharugo primary school had *S. haematobium* in their urine while 18 out of 100 from Okposi Primary school and 9 out of 105 from Umuezeoka primary school were positive for *S. haematobium.* This gives a prevalence of 25.0%, 18.0% and 8.6% respectively. From the result, it was found out that 24.3% of the males had *S. haematobium* as against 12.4% of the females. The pupils below the ages of 10 years had a prevalence of 7.7% while those of the 10-16 years had that of 24.1%.

Introduction

Schistosomiasis is caused by *schistosoma* species which is also known as Bilharzia (WHO, 1995). Urinary schistosomiasis is caused by *Schistosoma haematobium* which constitutes a major public health problem in many tropical and sub-tropical countries (Michaud *et al.*, 2005). *S. haematobium* is reported to be endemic in 53 countries in the Middle East and most of the African continent (Chitsulo *et al.*, 2000).

Two hundred million people worldwide are estimated to be infected with *S. haematobium* of which 70% live in sub-Saharan African (Jukes *et al.*, 2002). Although, infection with *Schistosomes* do not always result in clinical disease, and many infections are asymptomatic, *S. haematobium* infection however could cause haematuria, dysuria, nutritional deficiencies, lesion of the bladder, kidney failure, an

elevated risk of bladder cancer and in children-growth redardation (Mostafa *et al.*, 1999).

Accordingly, the estimates for morbidity and mortality in affected populations are high with school age children usually presenting with the highest prevalence and intensity of infection (WHO, 2002). Nigeria is one of the countries known to be highly endemic for urinary schistosomiasis with estimated 101.28 million persons at risk and 25.83 million people infected (Engels *et al.*, 2002). Studies,in Nigeria among school aged children in various parts of the countries and in both rural and urban environments have shown that *S. haematobium* is clearly a problem of this aged children ranges from 20-40% in typical communities (Umar and Parakoyi, 2005).

Schistosomiasis was first described in 1851 by Theodor Bilharz, after whom the disease was initially named bilharzia (Ross *et al.*, 2002). Five species of *Schistosomes* have been identified, of which the most commonly found three are *schistosoma mansoni, S. japonicum*, and *S. haematobium* (WHO,1998).In generally, *S. mansoni* is the most widely spread (Kabatareine *et al.*, 2004). S. *haematobium* is concentrated in Africa and the Middle East, while *S. Japonica* is found in Asia (WHO, 2002).

The *S.mansoni* and *S.japonica* cause chronic hepatic diseases and intestinal fibrosis (Arthur *et* al., 1998). The *S. haematobium* affects the urinary tracts and kidney as well as the reproductive system (Stothard *et al.*, 2006).

People are affected by contact with stagnant water used in normal activities such as personal hygiene and swimming or by professional activities such as rice cultivation and irrigation (Cheesbrough, 1998).

The transmission of urinary schistosomiasis is contigent on the presence of infected water, intermediate host and contact with human population (Ekwunife, 2003). Once excreted by the snail, the infective free-swimming cercariae then penetrate the intact skin of humans (Robber *et al.*, 1993).

However, the intensity of the urinary schistomiasis is measured by quantitative egg counts of feaces or urine, which shows the heaviest burden in the youngest age group (Engels *et al.*, 2002). The child's risk of infection increases peaking between the age of 10 and 20 (Kabatereine *et al.*,2004).

As a result of consequences of schistosomiasis infections in children and the previously reported prevalence of the infection in South-East of Nigeria, this is therefore, aimed at:

1. Investigating the prevalence of urinary schistosomiasis among primary school children in Ezza North Local Government Area of Ebonyi state.

2. Establishing a relationship between age and sex in the distribution of the disease.

3. Determining the source of the infection.

All these, will help the welfare of Ebonyi state particularly the L.G.A. studied.

Materials and Methods

Study area and sample collection

The study area was Ezza-North Local Government Area in Ebonyi state of Nigeria. This Local Government is made up of the following communities. They include: Oshiegbe, Umuezekoha, Umuezeoka, Ogharugo, Okposi and Oriuzo respectively. The climate is tropical and vegetation

characteristic is predominantly the rain forest with an average annual atmospheric temperature of about 30°C. There are two distinct seasons. The wet season takes place between April and October, while the dry season occurs from November to March. The major sources of water supply in these communities are rivers, streams and ponds.

Most communities are engaged in subsistence farming and fresh water fishing. Extensive use is made of various stream and ponds for their water related activities like drinking, bathing, washing, swimming and other ' domestic work. Their economic activities are based on agricultural work, involving cultivation of rice, yam, corn, cassava, potatoes, tomato, pepper,groundnut etc and these constituted the source of income of the people living in that area.

Urine collection

Out of six communities, three communities were chosen for the study. One primary school from each community was used for the study. Before the commencement of sampling in each school, a letter together with approved note from the local government Education secretary was sent to the Headmasters/Headmistresses of the school to give them an idea of what the study-was all about and to seek their cooperation. Thereafter, I instructed the subjects on how the sample could be collected correctly without contamination. I selected the subject at random whereby all the subjects in the population were assigned for sample collection with the active support of staff and pupils of the three schools. A total of 325 pupils were used for the study.

The samples in this study area were terminal urine sample which was collected into clean sterile universal containers. The samples were collected between 10:00hr and 14:00hr because the excretion of *S. haematobium* ova in urine is highest with peak around midday (Chessbrough, 1998). The urine samples were transported in a cool box along with an ice pack to keep the samples in dark and cool environment to avoid the egg from hatching as a result of exposure to light.

Laboratory analysis

In the laboratory, the following analysis were carried out;

Macroscopic analysis for the appearance of the urine sample.

Microscopic analysis

The examination of urine samples for ova of *schistosoma haematobium* was carried out using sedimentation method as described by Ekwunife (2003). This involved the transfer of the urine sample into a centrifuge tube and centrifiiging at 5000 rpm for 5 minutes to sediment the *schistosoma* ova. After centrifugation, the supernatant was decanted and a drop of sediment was added onto a grease free slide and covered with coverslip.The sediment was examined microscopically under x10 objective lens and x40 objective lens respectively and the number of ova on the slide were counted and reported as number per high power field (HPF) of urine samples.

Sample anaylsis

The analysis of collected, observed and recorded samples were done using simple arithmetic percentages (%) and chi- square (X^2) statistical test method. The general prevalence of urinary schistosomiasis was determined by simple percentages of infected and non-infected individual. The rates of prevalence were compared using X^2 tests. Similarly, the difference in prevalence of infection between school ages and the

variation rate by sex of pupils was also calculated by arithmetic percentages

Result and Discussion

Out of the 325 urine samples analysed, 57(17.5%) were positive for *S.haemfgpbium* while 268 (82,5%) were negative (see table 1),giving a prevalence of 17.5%. Out of 120 urine samples examined in community primary school Ogharugo, 30 (25.0%) were positive while 90(75.0%) were negative.From the 100 urine samples from Communit Primary School Okposi, 18(18.0%) were positive while 82(82.0%) negative. Out of the 105 urine samples collected from the pupils of community primary school Umuezeoka, 9(8.6%) were positive while 96 (91.4%) were negative is also shown in the table 1).

When the results were looked at in relation to the ages of the pupils, it was found out that out of the 130 pupils below the ages of 10 years, 10(7.7%) had *S. hoematobium in their urines while* 47(24.1%) pupils out of 195 within the ages of 10 to 16 had *S. haematobium* in their urine (see table 2)

Prevalence by sex distribution, from the 140 urine samples examined from males, 34(24.3%) were positive while 106(75.7%) were negative. Looking at the urine samples from the females, 23(12.4%) were positive while 162(87.6%) were negative (see table3).

Table 4 shows a reflection of the sources of water available to the communities studied, the infection rate of water supply from Ogharugo quarries pit and streams, Okposi streams and rivers, and as well as Umuezeoka rivers and wells were 34(19.7%), 17(17.3%) and 6(11.1%) respectively.

Urinary schistosomiasis is endemic in south east of Nigeria. The figures reported by Anosike *et al.(* 2000) which was carried out in the seven state of the south-east of Nigeria showed prevalence rate of:Abia(39%), Imo(18%), Edo(19%), Anambra(26%), and Ebonyi(67%).Out of the 325 urine samples analysed,57(17.5%) were positive for *S. haematobium.* The prevalence of S. *haematobium* in Ebonyi State in 2001 was 21.5% (Anosike *et al.,* 2001). Also, a survey in 1998 (korve ,2001) showed a prevalence of between 17% and 70% in Ebonyi State.

The study which showed a 17.5% of prevalence of S. *haematobium showed a reduction in the p*revalence rate. This is an indication that the preventive measures taken since 1998 are achieving good result.

Community primary school Ogharugo had the highest prevalence of 30(25.0%) followed by community primary school Okposi and community primary school Umuezeoka with the prevalence of 18(18.0%) and 9(8.6%) respectively. Poor waste/sewage disposal system, unhygiene condition in the community and active participation of pupils in water contact activities like swimming or professional activities such as rice cultivation and irrigation affect the prevalence (Feheesbrough, 1998). Availability of these ecological conditions are necessary for the breeding of the snail that allows for higher density of snails, which serve as an intermediate host for this parasite (Anosike *et al.,* 2002).

The conditions might explain the differences in the prevalence of S *haematobium* among the communities as their sources of water supply and waste management differed.

Table.1 Prevalence of S. haematobium among the primary schools examined within Ezza North L.G.A

Community Primary Schools	Number Examined	Number of Positive(%)	Number of Negative (%)
Ogharugo	120	30(25.0)	90(75.0)
Okposl	100	18(18.0)	82(82.0)
Umuezeoka	105	9(8.6)	96(91.4)
Total	325	57(17.5)	268(82.5)

Table.2 Prevalence by sex distribution

b Sexes	Number Examined	Number Positive(%)	Number Negative(%)
Males	140	34(24.3)	106(75.7)
Females	185	23(12.4)	162(87.6)
Total	325	57(17.5)	268(82.5)

Table.4 Prevalence in relation to the communities sources of water supply

	Source of Water Supply	Infections Rate
Ogharugo	Quarries Pit and Streams	34(19.7%)
Okposi	Streams and Rivers	17(173%)
Umuezeoka	Rivers and Wells	6(11.1%)

The prevalence of 34(24.3%) was found in males as against 23(24.3%) in females .This difference has been reported in various communities in Nigeria (Ofoezie et al, 1997).

Most young boys engage in swimming, bathing and fishing while most young girls are retained at home for house errands and cooking. These activities by the males may explain the difference.

The age in the distribution of infection with S *haematobium* in these communities was

such that the pupils from 10 years and above had the higher prevalence of *47(24.1%)* than those in the age group below 10 years who had the prevalence of 10(7.7%). *This* finding is similar to the work of Kabatereine *et at.(2004)* who reported that the child's risk of infection increases peaking between the age of 10 and 20.

This work shows that there is still a high prevalence of *S. haematobium* in the Ezza North L.G.A. studied, however, there has been a reduction in the last 15 years probably owing to improvement in education, it is therefore, recommended the following that;

1. Local government authority should provide good toilet facilities and potable water supply for domestic uses.

2. People should be further educated on the preventive / control measure of this infection.

3. Efforts should be made to eradicate the intermediate host.

The present study contributes to the management and control strategy of urinay schistosomiasis.

This should also draw the attention of government as various levels in the need to eradicate *S. haematobium* by the provision of social and health amenties.

References

Anosike, J.C., Nwoke, B.E.B andNjoku, A.J .(2001). The validity of haematuria in the community diagnosis of urinary schistosomiasis infection. P*athology. 75:223 - 225.*

Anosike, J.C: Njoku, A.J., Nwoke, B.E.S, Ajero, C.M.U:, Osagiede, U.R;

Okoro, Oru. and Nwosu, D.C. (2002). Epidemiology of urinary schistosomiasis in Ebonyi State Nigeria. *Intl. J. Envt Hlth. And Human Deopt* 3:5962.

Arthur, C., Young, R.C., Nevels, H. (1998) .Chronic consumption due to schistosomiasis and foreign body perforation, *Southern Medical journal*, 10: 35-53.

Chitsulo, L., Engels, D., Montresor, A., Saveold, L, (2000).The global status of schistosomiasis and its control, Acta Tropica 77: 41-51.

Cheesbrough M. (1998): District Laboratory practice in tropical countries Part 1. Cambridge University Press, London, 1998.

Engels, D., Chitsulo, L.,Montresor, A. and Saviolo, L. (2002). The global epidemiological situation of schistosomiasis and new approaches to control and research. Acta Tropica, Vol. 82 issues 2.

Ekwunife, C.A. (2003). Diagnostic and study techniques in schistosomiasis. 1st edition. Klaax Nig. 100pg.

Jukes, M.C.H.,Nokes, C.A. and Alcock ,K.J. (2002).Heavy schistosomiasis associated with poor short-term memory and slower reaction times in Tanzanian school children. *Trop Med Mt Health, 7(2):104 -117.*

Kabatareine, N., Brooker, S. and Tutahebwa, E. (2004). Epidemiology and Geography of *S. Mansoni* in Uganda: Implications for planning. *Tropical Medicine and International Health, 9:372 - 380.*

Korve K.N (2001). Report of Schistosomiasis control Activities in the South East of Nigeria. Pp 9-10.

Mostafa, M., Sheweita, S.A. and O' Connor, P.J.(1999). Relationship between schistosomiasis and bladder cancer. *Clin Microbiol 12:97 -111.*

Ofoezie, I.E, Asaulu, S.O, Christensen, N.O and Madesen, H .(1997). Patterns of infection with *Schistosoma haematobium.*

Robber,B. (1993). Schistosomiasis.In Trop. Disease Research Progress: 29-36.

Ross,A. And P.Sleigh A.(2002). Schistosomiasis, 346:1212-1220.

Stothard,J., Russell,T. and Edridah, M.(2006).Use of circulatory cathodic antigen dipstick for detection of intestinal and urinary schistosomiasis .*Acta Trop. 97:219-222.*

Umar, A.S. and Parakoyi, D.B.(2005).The prevalence and intensiy of Urinary Schistosomiasis Among School Children Living along the Bakalori *Dam Niger Postgrad Med J* .12:168-172.

World Health Organization (2002). Health impact of schistosomiasis Disease and mortality. Bull. World Health Org. 19(6):602- 605.

World Health Organization (1995).The control of schistosomiasis .Report of World organization .Expert Committee. WHO technical report series .26:33-38.

World Health Organization (1998). Progressive Report of Division of Control of Tropical: Disease WHO/CTD/PR198:! 19-130PP.