



Published Quarterly
Mangalore, South India
ISSN 0972-5997
Volume 3; Issue 1; January-March

Original Article

A survey of the prevalence of Schistosomiasis among pupils in Apata and Laranto areas in Jos, Plateau State

Okpala HO, Federal College of Veterinary and Medical Laboratory Technology, National Veterinary Research Institute, Vom, Plateau State, Nigeria

Agwu E, Dept. of Medical Microbiology, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, Nigeria

Agba MI, Dept. of Medical Microbiology, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, Nigeria

Chimezie OR, Federal College of Veterinary and Medical Laboratory Technology, National Veterinary Research Institute, Vom, Plateau State, Nigeria

Nwobu GO, Federal College of Veterinary and Medical Laboratory Technology, National Veterinary Research Institute, Vom, Plateau State, Nigeria

Ohihoin AA, Dept. of Medical Microbiology, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, Nigeria

Address for Correspondence:

Agwu Ezero, Department. Of Medical Microbiology, Faculty of Pathological Sciences, College of Medicine, Ambrose Alli University, Box 14, Ekpoma, Edo State, Nigeria

E-mail: Agwuezero@yahoo.com

Citation: Okpala HO, Agwu E, Agba MI, Chimezie OR, Nwobu GO, Ohihoin AA. A survey of the prevalence of Schistosomiasis among pupils in Apata and Laranto areas in Jos, Plateau State *Online J Health Allied Scs.* 2004;1:1

URL: <http://www.ojhas.org/issue9/2004-1-1.htm>

Open Access Archive: <http://cogprints.ecs.soton.ac.uk/view/subjects/OJHAS.html>

Abstract

Prevalence of Schistosomiasis in apparently healthy primary school pupils in Apata and Laranto areas of Jos was surveyed using 300 samples of stool and 300 samples of urine. The stool samples were processed using formol ether concentration techniques while the urine samples were processed by ordinary centrifugal sedimentation technique. The overall prevalence of urinary (*Schistosoma haematobium*) and intestinal (*Schistosoma mansoni*) schistosomiasis was 0.67%, with three samples (1% prevalence) positive for intestinal (*Schistosoma mansoni*) and one sample (0.33% prevalence) positive for urinary (*Schistosoma haematobium*) schistosomiasis respectively. Two of the three cases positive for *Schistosoma mansoni* were males in the age group of 11–15 years and the one positive for *Schistosoma haematobium* was a male patient. Prevalence in the studied area is therefore very low and immigration, sex and age dependent.

Key Words: Schistosomiasis, pupils

Introduction

Schistosomiasis in man is a chronic and debilitating disease caused by flukes known as Schistosomes.(1) It is one of the most common parasitic infections in the world.(2)

There are four species of schistosomes responsible for human schistosomiasis - intestinal schistosomiasis caused by *Schistosoma mansoni*, *Schistosoma japonicum* and *Schistosoma intercalatum* and *Schistosoma haematobium* responsible for urinary schistosomiasis.(3) Other Schistosomes of veterinary importance include *Schistosoma bovis*, *Schistosoma mathei*, *Schistosoma hippopotami*, *Schistosoma sprinadalis* and *Schistosoma rohhaini*. Some of these have been reported in man.(1) At least 200 million people in 74 countries are infected with schistosomiasis and at least 600 million are at risk of infection.(4)

The intermediate snail host for *S. Mansoni* is *Biomphalaria* species. *Bulinus* snails are intermediate host for *S. haematobium* and *Oncomelania* snail for *S. japonicum*.(5) The transmission of schistosomiasis takes place only in the place where fresh water snail vector is present and where there is contact between the population and infested water.

Various socio-epidemiological factors are responsible for transmission of the disease and level of infection. Among such factors are the following: distance from transmission site, migration and emergence of new foci, urbanization, socio-economic status, sanitation, water supply patterns and level of faecal contamination of water source.(6) Those at high risk of infection are people involved in fishing activities, farming, bathing, paddling of canoes, swimming and possibly handling of infected snail host in the case of collecting edible ones.(7) Transmission of urinary and intestinal schistosomiasis occurs when the infected person urinates or defecates in the water bodies which serve as source of drinking or bathing, thereby introducing eggs which hatch into larva that infect the snail hosts. This can only be controlled by the provision of latrines and urinals or the introduction of effective sewage disposal systems. The provision of civilized swimming pools for recreational activities could serve as a good control measure for the spread of the disease.(2) Wearing of footwear to protect the legs could also be a good protective measure against active penetration by the cercariae of the schistosoma.(8)

This survey was designed to evaluate the prevalence and intensity of schistosomiasis in primary school pupils in Apata and Laranto area in Jos Plateau state, to determine the predisposing factors of this disease, to find the level of awareness of the pupils with respect to the disease, to educate them on its mode of infection and to identify ways of preventing and controlling the disease.

Materials and Methods

THE STUDY AREA:

The study was carried out in Apata and Laranto areas in Jos North Local Government Area of Plateau state. The two areas are about 2 kilometers from the Jos North Local Government Area Headquarters. They lie between latitude 9° 53' and Longitude 8° 52' North and about 1,200 meters above sea level.

Apata and Laranto have the same minimum and maximum temperatures of 22°C (72°F) and 30°C (86°F) respectively. The two distinct seasons in the area are the wet/raining and dry season. The wet season lasts from April to October and is characterized by heavy rains with subsequent floating of banks of river, streams, ponds, ditches and other hydrological resources; the dry season lasts from November to March, characterized by cool, dry winds in December and January and high temperature in February and March. There is a water body known as "Rafi" which passes through Apata and Laranto from Nasarawa area in the same Jos North LGA. Children around this area swim, fetch, wash and fish in "Rafi". The major occupations of the inhabitants are farming, trading and civil service.

COLLECTION OF SAMPLES:

This survey was conducted between November 2000 and February 2001. Samples were collected from pupils in Decency Nursery/Primary school (DNPS) Laranto, Bible Faith Christian nursery/Primary school (BCNPS) Laranto and Efficiency Nursery/Primary School (ENPS) Apata. Information collected includes age, sex, water source and whether the pupil has been in Laranto/Apata or has just come new. Each pupil was given two clean, dry screw-capped containers carrying the same identification numbers and were instructed on when and how to collect the samples.

The consent of the pupils and their parents were sought and obtained before supra-pubic and terminal urine were collected. Supra-pubic urine was collected from five pupils who complained of lower abdominal pain and were also oliguric. Supra-pubic urine was collected between 10 a.m. and 12 noon and after exercise to ensure maximum excretion of eggs.(9) Both urine and stool samples collected were taken to the laboratory, processed and examined immediately.

LABORATORY PROCESSING OF SAMPLES:

URINE: The method described by Dazo et al (10) was employed in processing the urine samples before examination.

STOOL: The method of Allen and Ridley (11) was employed for examination of the stool samples. A wet mount of deposits of urine and stool were examined under the microscope with x10 objective and any object seen confirmed with x40 objective.

Results

The result of this survey reveals that 4(0.67%) out of the 600 samples examined were positive for *Schistosoma* species. One (0.33%) urinary (*S. haematobium*) and 3 (1.0%) intestinal (*S. mansoni*)

Schistosoma species were seen in the 300 urine and stool samples analyzed (Tables 1, 2 and 3 below).

TABLE 1: Sex specific prevalence of Intestinal and urinary Schistosomiasis from 300 urine samples analyzed

Sex	No. examined	Number (%) Positive for Schistosomiasis	
		Intestinal (<i>S.mansoni</i>)	Urinary (<i>S.haematobium</i>)
Male	182	2 (1.10)	1 (0.55)
Female	118	1(0.85)	0 (0.00)

TABLE 2: Age specific prevalence of intestinal and urinary Schistosomiasis from 300 stool samples analyzed

Age	No. examined	Number (%) Positive for Schistosomiasis	
		Intestinal (<i>S.mansoni</i>)	Urinary (<i>S.haematobium</i>)
1-5years	80	0(0)	0(0)
6-10	130	0(0)	0 (0)
11-15	90	3(3.3)	1(1.1)

Table 3: Site and source specific prevalence of urinary and intestinal Schistosomiasis

Sites/Water Source	No. examined	No. (%) positive
Sites – DNPS	150	2 (1.33)
BFCS	300	1 (0.33)
ENPS	150	1 (0.67)
Water Source – Well water	192	1 (0.52)
Pipe-born water	274	0 (0.00)
River/Stream	134	3 (2.23)

DNPS = Decency Nursery Primary School; BFCS = Bible Faith Christian Nursery /Primary School; ENPS = Efficiency Nursery /Primary School.

Discussion

From the result obtained (Table 1), only one sample of urine was positive for urinary schistosomiasis giving a prevalence of 0.55%. This prevalence is lower compared to 22.4% in some primary schools in Jos, 2.9% at Abattior area and 49.9% in Faringada and student village area, all in Plateau state, as reported by Akunfongwe.(12)

Three (3.33%) stool samples were positive for intestinal Schistosomiasis.(Table 2) This is lower than what was reported in other parts of plateau state. For instance, Akunfongwe (12) reported 8% in Panyam, 28% in Jos, 35% in some primary schools of Jos.

The lower prevalence may be as a result of increased awareness about the source of this infection and enforcement of certain rules and regulations aimed at preventing infection by schistosomes. Preliminary survey reveal that for over one year from the time of this survey, these

schools near the water body "Rafi" have made it a rule, that no pupil visits the water body for any reason, and de-worm their pupils every year.

Through personal oral interview, it was found that the two pupils who were positive for intestinal schistosomes were brothers and they joined their parents in irrigation farming in another area in Jos. The other pupil came into Jos from Kaduna during the Sharia riots in April/May 2000. The only pupil positive for urinary schistosomiasis had lived in different parts of this country due to the nature of parents' job (nomadic herdsman). He came into Jos from Kwara state, about one month before the time of this work. He might have possibly been infected in any of these places he has lived in.

In relation to sex, the only positive case of urinary schistosomiasis is a male pupil and two out of the three cases of intestinal schistosomiasis were males. There were no differences in prevalence between males and females. This observation was made although males are more

involved in activities that have to do with water bodies e.g. swimming, washing, paddling of canoes and irrigation.(8)

The only infection of urinary schistosomiasis was found in the age group 11-15 years (Table 2) giving a prevalence of 1.1%. The three cases of intestinal schistosomiasis were also found in the age group of 11-15 years giving a prevalence of 3.33%. Those in the age group of 11-15 years were mostly affected probably because they frequently involve themselves fully in activities that bring them in contact with the source of infection.

One case of schistosomiasis was found among the pupils using well water and three samples were positive among pupils using river/stream water.(Table 3) This may be as a result of contamination of wells, rivers/streams with cercariae. The people who use well water might have been infested from contaminated streams around the area.

The observed prevalence of Schistosomiasis in the study area is very low, probably due to increased awareness on the source of infection and enforcement of certain rules and regulation on the pupils aimed at preventing infection by schistosomiasis. It was also observed that Schistosomiasis in the area studied is dependent on sex, age and immigration.

Based on the findings of this study, we hereby recommend as below:

Schistosomiasis control programmes should embark more on health education about the life cycle of the parasites, the need for proper disposal of faeces and urine. The federal government should provide pipe borne water to rural areas to further reduce the observed rate of infection with Schistosomiasis in the study area and other parasites that depend on contaminated water for transmission, and pupils/students and civil servants coming to the study area from other stations should be screened before allowing them to settle in the area.

References

1. Noble ER, Glem AN. Biology of animal parasites. (5th edition), Lea and Febiger, Philadelphia, USA. 1982;157-158.
2. Gracio MA, Rollinson D, Costa C, Nhaque AT. Intestinal Schistosomiasis report of the first cases in Guinea Bissau. Transaction of the Royal society of

- Tropical Medicine and Hygiene. 1992; 96-183.
3. World Health Organization. Report on Tropical Disease Research 9th Programme. 1989
4. World Health Organization. Public Health impact of Schistosomiasis, disease and mortality. Bulletin of the World Health Organization. 1993; 71(6):657-662.
5. Ukoli FMA. Schistosoma and Schistosomiasis. Introduction to Parasitology in Tropical Africa, John Willey and Sons Limited. New York. 1984; 52-59.
6. Bareto ML. Geographical and economic factors relating to distribution of Schistosoma mansoni in the urban areas of North-East Brazil.
7. Second report of the WHO expert committee on the control of Schistosomiasis [Meeting held in Geneva from 8-15 November 1991] WHO Technical Report Series, 830. 1991.
8. Amano T, Freeman GL JR, Colley DG. Reduced reproduction efficiency in mice Schistosomiasis mansoni and in uninfected pregnant mice injected with antibodies against *S. Mansoni* soluble egg antigens. The American Journal of Tropical Medicine and Hygiene. 1990;43(2):180-185.
9. Cheesbrough, M. Medical Laboratory Manual for Tropical Countries Vol. 2 Kent Butter Worth & Co. 1989; 10– 30.
10. Dazo, BC, Bilas, JB. Two new field techniques for detection and counting of *Schistosoma haematobium* eggs in urine samples with an evaluation of both methods. Bulletin of the World Health Organization. 1974; 51:399-408.
11. Allen AHV, Ridley DS. Further observations on the formol-ether concentration techniques for parasites. Journal of Clinical Pathology. 1970; 23: 535-546.
12. Akufongwe, PF, Dondji B, Okwuosa, VN, Dakul DA, Ntonifor HN. Observed disparity on schistosome infection rates in field Biomphalaria pfeiffer (Krauss) between two areas of the Jos metropolis, Nigeria. Parasite. 1995; 2: 89-91.