



## PREVALENCE OF URINARY SCHISTOSOMIASIS AMONG PRIMARY SCHOOL PUPILS IN KIRFI L.G.A BAUCHI STATE

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### ABSTRACT

**Background:** Schistosomiasis is one of the most common infectious diseases in the world and is caused by the *Schistosoma* genus of the fluke. The form of Schistosomiasis affecting the urinary tract is caused by *Schistosoma haematobium*.

**Aim:** This study was designed to determine the prevalence of Urinary Schistosomiasis among primary school pupils at Kirfi Local Government Area.

**Methodology:** Two hundred mid-stream urine samples were collected from two hundred subjects from four randomly selected primary schools.

**Result :** The overall prevalence of *S. haematobium* infection was 27.5% (55/200) and was significantly higher among subjects enrolled for Baba primary school and Badara central primary school ( $\chi^2 = 26.76$ ,  $df = 3$ ,  $p = 0.000066$ ). There was no significant difference in prevalence among age groups ( $\chi^2 = 1.33$ ,  $df = 2$ ,  $p = 0.51$ ), both sexes studied ( $\chi^2 = 2.20$ ,  $df = 1$ ,  $p = 0.138$ ) and class of the subjects ( $\chi^2 = 1.99$ ,  $df = 5$ ,  $p = 0.85$ ). Subject that sourced their bathing water from river/stream had highest prevalence of 73.3% (11/15) ( $\chi^2 = 25.6$ ,  $df = 3$ ,  $p = 0.000011$ ).

**Conclusion:** Conclusively prevalence of Urinary Schistosomiasis among primary school pupils at Kirfi Local Government Area of Bauchi State is relatively high and requires attention. Thus, mass de-worming of pupils and de-contamination of the water are recommended.

**Key words:** urinary schistosomiasis, primary school pupils, Kirfi L.G.A, Bauchi state

### INTRODUCTION

Diseases of various origins have been identified to pose major challenge to human well-being (Hillis, 2000; Bafani *et al.*, 2002; Miller *et al.*, 2002; CDC, 2003; WHO 2003). Among these diseases, schistosomiasis or bilharzias, a tropical parasitic disease cause by blood-dwelling flukes of the genus *Schistosoma*, is of public health concern in developing countries (Gryseels *et al.*, 2006). A genus *Schistosoma* commonly known as blood-flukes and bilhazia includes flat worms which are responsible for a highly significant parasitic infection of human and is considered by World Health Organization as the second most socio economically devastating

parasitic disease, next only to malaria with hundreds of millions infected worldwide (WHO, 2006). They are unique among trematode or any other flat worm in that they are diacious with distinct sexual dimorphism between male and female. Eggs are passed through urine or feces to fresh water, where larva must pass through an intermediate snail host, before a different larval stage of the parasite emerges that can infect a new mammalian host by directly penetrating the skin (WHO, 2002). Urinary Schistosomiasis is caused by *Schistosoma haematobium* and is endemic in sub-Saharan Africa, including Nigeria. Within sub-Saharan Africa, Nigeria is the country with the most cases of human Schistosomiasis – about 29 million in 2008.

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In Nigeria, urinary schistosomiasis is wide spread in both rural and urban communities, with prevalence ranging between 2% and 90% and vast majority of cases occurring among the poor and marginalizes. It has been reported in all 36 states of Nigeria including the Federal Capital Territory. The disease is associated with water resources development project such as dams and irrigation schemes, and slow-flowing and stagnant water which support the breeding and survival of snail intermediate host. The resident of communities around such water development projects or in land water whose style of life regular contact with the contaminated water are at a great risk of the disease, most importantly, the school-aged children (Tayo *et al.*, 1980). The problem of lack of pure and portable water supply in school and homes in Kirfi Local Government Area makes the children at high risk of exposure to Schistosomiasis and implication of this disease in the children affects socio-economic development of country (Nnoruka, 2000). Those at high risk of infection are people involved in fishing activities, farming, padding of canoes, swimming and possible handling of infected snail host during collection of edible ones (WHO, 1985). Although schistosomiasis can be fatal, most infected individuals suffer from chronic debilitating symptoms such as anemia, haematuria and fatigue. Schistosomiasis is prevalent but the associated morbidity is low and varied (Gryseel *et al.*, 2006). Based on 200 million infected people worldwide, the total number of disability adjusted life years (DALY) lost to schistosomiasis is estimated at 1.532 million per year of which 77% are in sub-Saharan Africa (Lopez *et al.*, 2006). Meta analysis indicated a mortality estimate up to 280,000 deaths annually in sub-Saharan Africa alone (Vander Werd *et al.*, 2006). Although the intimate connection between conflict and Neglected Tropical disease (NTD) such as schistosomiasis is known (Beyrer *et al.*, 2007), the prevention and control of such disease in conflict and emergency setting are often neglected. In

such context, more emphasis is given for life saving services and disease of epidemic importance. If the prevention and control of such disease do occur, they are often uncoordinated and driven by the occurrence of a cluster of cases. Urinary Schistosomiasis can be controlled by the provision of latrines and urinals or the introduction of effective sewage disposal system. The provision of civilized swimming pool or recreational activities would serve as a good control measures for the spread of the diseases (Gracio *et al.*, 1992). Wearing foot wear to protect the legs could also be a good protective measure against active penetration by the cercariae of the schistosoma (Amamo *et al.*, 1990).

## **MATERIALS AND METHODS**

Between March – April, 2013, mid-stream urine sample was collected from 200 subjects enrolled from four selected primary schools (Bara central primary school, Baba primary school, Kirfi- Cheledi central primary school and Badara central primary school). Ethical approval for the study was obtained from the Health Department, Kirfi Local Government secretariat.

A letter of introduction was given to the headmaster of each school and verbal informed consent was obtained from the subjects. Questionnaire was used to collect demographic data. The inclusion criteria were:

Subjects attending any of the selected schools, Residence within Kirfi Local Government Area and have not travelled out of the area in the preceding four weeks. Clearance from Head teacher and informed consent of the subjects or/and the parent/guardians. The exclusion criteria were: Failure to secure parents/guardians' consent and Menstruation in female subjects

### **Sample Collection and Analysis**

The student were given the sterile, dry, wide necked leak proof container and requested 20ml specimen and were explained how to collect the urine with as little contamination as possible (Cheesbrough, 2006)

**Analysis**

The urine samples were collected and shake well and allow it to sediment for One hour, at the end of the one hour the sediment were carefully withdrawn without disturbing the sediment, the sediment was transferred to centrifuge and centrifuge for 5 minutes at 500g. The supernatant was then discarded and sediment examined as wet preparation using x10 objectives to search for ova of *Schistosoma haematobium* (Ochei and kolhatkar, 2008)

**RESULTS**

The demographic characteristics of the subjects whose urine samples were analyzed in the study are presented in Table 1. The mean  $\pm$  standard deviation of subject's age is  $9.5 \pm 2.3$  (4-15) years. The overall prevalence of urinary schistosomiasis among

the 200 subjects studied was 27.5% (55/200). Table 2 presents the age group distribution of the infection among the subjects. There was no significant difference among various age groups ( $\chi^2 = 1.33$ ,  $df = 2$ ,  $p = 0.51$ ).

The sex distribution of the 55 positive subjects was analysed and presented in Table 3. The prevalence was similar among the two sexes ( $\chi^2 = 2.20$ ,  $df = 1$ ,  $p = 0.138$ ).The school distribution of the 55 positive subjects was analyzed and presented in Table 4. The prevalence of *S. haematobium* was significantly highest among the subjects enrolled at Baba primary school (36%, 18/50) and Badara central primary Central primary schools ( 50%, 25/50) then Bara central primary school and Kirfi/ Cheledi central primary school ( $\chi^2 = 26$ ,  $df = 3$ ,  $p = 0,0000066$ )

**Table 1. Demographic characteristics of the enrolled subjects**

Variables Percentage (%)	Number Enrolled	Percentage
<b>Age groups (years)</b>		
≤ 5	20	10.0
6-10	116	58.0
11-15	64	32.0
<b>Sex</b>		
Male	133	66.5
Female	67	35.5
<b>School Class</b>		
I	20	10.0
II	8	4.0
III	26	13.0
IV	60	30.0
V	25	12.5
VI	61	30.5

**Table 2 Age distribution of Pupils with Urinary Schistosomiasis**

Age Groups (Years)	Number Enrolled	Positive	Prevalence (%)
≤ 5	20	5	25
6-10	116	29	25
11-15	64	21	32.8
<b>Total</b>	200	55	27.5

\*P = 0.51

*Prevalence of Urinary Schistosomiasis among Primary*

**Table 3 Sex distribution of Urinary Pupils with Schistosomiasis**

Sex	Number enrolled	positive	Prevalence %
Male	133	41	30.8
Female	67	14	20.9
<b>Total</b>	200	55	27.5

\*P = 0.138

**Table 4. Incidence of Urinary Schistosomiasis based on schools**

Name Of School	Number Enrolled	Positive	Prevalence (%)
Baba Primary School	50	18	36
Badara Central Primary School	50	25	50
Bara Central Primary School	50	5	10
Kirfi /Cheledi Central Primary School	50	7	14
<b>Total</b>	200	55	27.5

\*P = 0.0000066

**Table 5. Occurrence or incidence of Urinary Urinary Schistosomiasis among the enrolled subjects based on class**

Prim. Classes	Number Enrolled	Positive	Prevalence %
I	20	6	30.0
II	8	1	12.5
III	26	7	26.9
IV	60	18	30.0
V	25	5	20
VI	61	18	29.5
<b>Total</b>	200	55	27.5

\*P = 0.85

**Table 6. Occurrence of schistosomiasis based on subjects sources of bathing water**

Source Of Water	Number Enrolled	Positive	Prevalence %
Bore hole	40	10	25
River /stream	15	11	73.3
Tap	63	7	11.1
Well	82	27	32.9
<b>Total</b>	200	55	27.5

\*P = 0.000011

**DISCUSSION**

The prevalence of 27.5% (55/200) recorded in this study is significantly higher than the prevalence of urinary schistosomiasis among preschool children in rural community near Abeokuta, Nigeria (Ekpo *et al.*, 2010). However, it is similar to prevalence of 24.3% found in primary school children of Konduga Local Government Area of Borno state (Biu *et al* 2009). The study also shows that the prevalence was significantly highest among the pupils bathing with

river/stream 73.3% (11/15). This is an agreement with previous studies that have reported higher prevalence in subjects frequently exposed to the contaminated water 22 % (Biu *et al* 2000). The study also revealed that the prevalence was statistically highest in subjects enrolled from Baba primary school and Badara primary school 36% (18/5) and 50% (25/50) respectively than Bara primary school and Kirfi/Cheledi central primary school 10% (5/50) and 7% (7/50) respectively.

This is because The Baba and Badara primary schools were located near river/stream where most children develop the habit of bathing inside. The typical high prevalence observed among school children with males having a higher rate of 30.8 % (41/133) prevalence than their female counterparts having 20.9% (14/67) prevalence. Similar trends have been observed in endemic areas as earlier reported (Ofoezie et al., 2002). The high prevalence observed in males is due to the fact that males tend to go to the river on a regular basis to fetch water for domestic use, play or bath and even fish unlike the females that may not attach any importance to such water contact activities but will prefer to always be at home attending to house chores.

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#### CONCLUSION

In conclusion the study revealed a high prevalence of Urinary Schistosomiasis among primary school pupils at Kirfi Local Government Area of Bauchi State, Nigeria. The infection affects both sexes, all aged groups sampled and all schools. However, the prevalence was highest among subject enrolled from two schools that are situated close to the river.

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