

SCHISTOSOMIASIS AMONG STUDENTS IN A LOCAL GOVERNMENT AREA OF KADUNA STATE IN NORTHERN NIGERIA

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ABSTRACT

Aim: Was to determine prevalence of schistosomiasis among secondary school students in Jama'a local government Area of Kaduna State between April and July 2005.

Material Method: A total of 306 students were recruited from 774 students into the study and each submitted a sample of urine and stool. The stool samples were examined both macroscopically and microscopically (Direct and formal ether concentration techniques) while urine samples were prepared using the sedimentation techniques. The specimens were examined for eggs of *Schistosoma spp.*

Result: The Prevalence of Schistosomiasis in the study was 19.0%. *Schistosoma mansoni* had

12.4% while *Schistosoma haematobium* was 6.5%. Infections were more common in males (23.6%) than the females (12.2%). Students that got their water supply from the river and pond were the most infected, while those that use tap water were the least infected.

Conclusion: The study has demonstrated that Schistosomiasis is endemic in the study area. More attention should be given to personal hygiene and prompt diagnosis and treatment of infected persons as a way of controlling the disease.

INTRODUCTION

Schistosomiasis is a chronic debilitating disease caused by blood fluke belonging to the phylum platyhelminthes and genus *Schistosoma*.

The genus has four species of medical importance, Urinary Schistosomiasis caused specifically by *Schistosoma haematobium*, which affects the lower abdomen, and genito urinary tract, while Intestinal schistosomiasis is caused by *Schistosoma mansoni*, *Schistosoma japonicum* and *Schistosoma intercalatum*. They affect the mesenteric side of the intestine. *Schistosoma haematobium* and *Schistosoma mansoni* are the most prevalent species in Africa.¹

Schistosomiasis is a major disease of public health importance second to malaria in parasitic infection. Over 271 million cases of human Schistosomiasis exist in the world. The scourge of Schistosomiasis on mankind has prompted the World health organization to vigorously embark on its control². It is clear that the high prevalence of Schistosomiasis in tropical Africa is as a result of the combined effects of ecological and parasitological factors as well as the socio economic condition, behavior and culture of the people³

In Nigeria about 250,000 cases of Schistosomiasis were reported between 1980-

1990⁴. This is however a gross under estimation since many cases were not reported. Schistosomiasis is endemic in Nigeria; previous studies of the epidemiology of Schistosomiasis in different parts of Nigeria revealed that the disease is endemic in the country with children worst affected. Schistosomiasis caused death by exerting injurious effects on organs such as the liver, intestines, kidneys, bladder and urinary tract, it renders people less resistant to other infectious disease by weakening their ability to work, the disease reduces national output and there by engenders poverty⁴.

The disease has increasingly been associated with water or water related development projects such as irrigation schemes and constructions of dams, both water reserves and hydroelectric power⁵. Infection is transmitted through human contact with water bodies (swamps, dams, lagoons, irrigation schemes etc) infected with the cercariae during fishing, swimming and washing clothes. The prevalence of the disease is probably on the increase especially with increase in construction of many water projects. Transmission in some areas is generally influenced by local

transmission characteristics, which include the pattern and extent of environmental contamination with human faeces and urine, human contact with contaminated water and the level of public awareness of the disease⁶.

The definitive hosts are man and other animals like rodents, pigs and baboons. The intermediate host is mainly water snail. The control of Schistosomiasis requires an integrated approach involving population-based chemotherapy, provision of adequate water supply for domestic use, sanitary facilities and a continued public health education programme⁷. Tools for controlling Schistosomiasis are available but a successful and sustained eradication programme has proved difficult and is limited to particular geographical areas.

Although important progress has been made in some locations, the overall distribution of the infections has continued to increase in the last decade this is due to population growth, migration of individuals and creation of new habitats by large scale irrigation projects and dams (8). The overall objective of the control of Schistosomiasis in recent years is to reduce its morbidity and emphasis on Schistosomiasis

control has shifted from transmission intervention by environment and vector control measures, to reduction of morbidity in infected individuals. This change from mollusciciding to chemotherapy, because of large-scale application of molluscicides is expensive, toxic and difficult to sustain⁹. Thus more attention is now being focused on infected individuals and administering of drugs like praziquantel. Documented successes in Schistosomiasis control have consistently been linked to political commitment, the involvement of peripheral authorities, and allocations of local resources and long-term implementation of concerted control strategies¹⁰.

The objective of this study, therefore, was to determine the prevalence of Schistosomiasis among secondary school students in Jama'a Area Government of Kaduna State and to document relationship between its prevalence and the different socio economic variables in order to proffer control measures

MATERIALS AND METHODS

STUDY SITE

The study was carried out in Jama'a Local Government Area of Kaduna State. The Local Government has its headquarters in Kafanchan; it is bordered by Kaura Local Government to the North, Zongo Kataf to the East, Jaba Local Government to West. There is only one day secondary with 215 students population and two boarding secondary schools with 559 students population, a dam, a river and several ponds. The main tribes in the local government area are Bajju, Hausa, Yoruba, and Fulani's. The main occupation of the people in the area is farming. Consent of the Principals of the secondary schools were sought before commencement of the study. Arrangement was also made with them on the days and time for the collection of specimens.

SPECIMEN COLLECTION

Specimen containers were randomly distributed to 328 secondary schools students; each participant was given two wide mouthed, 25cm, grease free, screw-capped specimen bottles carrying the same identification number and name. They were instructed to collect their urine

between 10am and 1200noon, the peak period of excreting *Schistosoma heamatobium* eggs (11) and to include first and last drops. Early morning stool was collected while avoiding contamination with water and or sand. Fifteen of the students brought only urine specimens and 7 students did not bring any specimen, therefore 22 of the students were excluded from the study. As the samples were being retrieved from the participant's information on their personal data, source of their water supply and toilet facilities, were documented using a questionnaire.

LABORATORY ANALYSIS

Urine Samples

Physical appearance of each urine sample was noted and the samples were prepared for microscopic examination using the method described by Dazo and Biles (12). Preparations were examined for eggs of *Schistosoma haematobium* using 10x and 40x objectives.

Stool Samples

Each of the stool samples was examined macroscopically and recorded. In preparing them for microscopic examination, the formol

ether concentration method described by Allen and Ridley¹³ was adopted. Preparations were subsequently examined for ova of *Schistosoma mansoni* using 10x and 40x objectives.

RESULTS

Three hundred and six (306) students were recruited into the study. Paired samples of urine and stool were collected from each of the students and examined for *Schistosoma* ova. Twenty (6.5%) of the urine samples were positive for *Schistosoma haematobium* while 12.4% prevalence was recorded for *Schistosoma mansoni* in the stool samples. Students aged 10-14 years of age had the highest prevalence for both *Schistosoma haematobium* and *Schistosoma mansoni*, 9.9% and 19.8% respective. Those aged between 15-19 years followed, with 4.7% for *Schistosoma haematobium* and 8.1% for *Schistosoma mansoni* respectively, while no infection with either *Schistosoma haematobium* or *Schistosoma*

mansoni was recorded in the age group >20 years. (Table I).

Table II shows the distribution of schistosomiasis by the schools studied in the local government area. The day school recorded higher prevalence of infection with both *Schistosoma spp* compared to the two boarding schools. *Schistosoma haematobium* was 7.5% in the day school as against 6.0% in the boarding schools while for *Schistosoma mansoni* the day school recorded 15.1% and the boarding schools 12.0%. Males were more infected than females with both *Schistosoma haematobium* and *Schistosoma mansoni* ratio 9:1 and 2:1 respectively (Table III).

Students who use rivers and ponds as their source of water supply had the highest risk of schistosomiasis both urinary and intestinal. Those that use tap water followed for urinary schistosomiasis and those that use well water for intestinal schistosomiasis (Table IV).

TABLE 1: PREVALENCE OF SCHISTOSOMIASIS IN RELATION TO AGE GROUPS IN JAMA'A LGA OF KADUNA STATE

AGE (years)	NUMBER EXAMINED	URINE		STOOL	
		No. Positive	Percent	No. Positive	Percent
10-14	131	13	9.9	26	19.8
15-19	149	7	4.7	12	8.1
>20	26	0	0.0	0	0.0
TOTAL	306	20	6.5	38	12.4

TABLE 2: THE DISTRIBUTION OF SCHISTOSOMIASIS BY SCHOOL S

SCHOOL	NUMBER EXAMINED	URINE		STOOL	
		No. Positive	Percent	No. Positive	Percent
A	200	12	6.0	24	12.0
B	106	8	7.5	16	15.1
TOTAL	306	20	6.5	38	12.4

KEY

- A = Boarding Schools (Government Secondary Schools Takwau and Kafanchan)
 B = Day School (Baptist Science Academy)

TABLE 3: PREVALENCE OF SCHISTOSOMIASIS IN RELATION TO SEX

SEX	NUMBER EXAMINED	URINE		STOOL	
		No. Positive	Percent	No. Positive	Percent
Male	183	18	9.8	25	13.8
Female	123	2	1.6	13	10.6
TOTAL	306	20	6.5	38	12.4

TABLE 4: PREVALENCE OF SCHISTOSOMIASIS IN RELATION TO SOURCE OF WATER USED BY RESPONDENTS

SOURCE OF WATER	NUMBER EXAMINED	URINE		STOOL	
		No. Positive	Percent	No. Positive	Percent
Tap water	141	1	7.0	3	2.1
Well water	75	3	4.0	6	8.0
River Pond water	90	16	17.8	29	32.2
TOTAL	306	20	6.5	38	12

DISCUSSION

The prevalence of Schistosomiasis observed in this study was 19.0%. Schistosomiasis is one of the most important endemic diseases in Nigeria. The prevalence of this disease like many other endemic diseases is affected by the socio cultural characteristic of the area. The prevalence of urinary Schistosomiasis in this study is higher than rates recorded in other parts of Nigeria, such as 1.2% by Okapala in North central Nigeria (14) 4.2% by Ofoezic et al (15) in North Western Nigeria. However higher prevalence rates were recorded 20.5% by fajewuyomi, et al, and Adeoye et al in South Western Nigeria (16). The rate of infection in this study is not very high because

the study was carried out among secondary school students who have knowledge on personal hygiene.

The day School showed a higher prevalence rate of 22.6% compared to the 18.0% for the boarding secondary schools. This may be due to the fact that it is a day secondary student and student's after school hours go and play with contaminated water bodies.

The age groups of 10-14 years of age had the highest prevalence for both *Schistosoma haematobium* and *Schistosoma mansoni*, 9.9% and 19.8% respectively. This might be due to the fact that these age groups visit streams and other water bodies for recreational activities such as swimming, thereby exposing them to the

cercariae. It is remarkable that students in the age groups 20 years and above recorded no Schistosomiasis infection; this could be that at this age group the students are more enlightened and they take necessary precautions against the infections.

Males (23.6%) were more infected than females (12.2%) this could be due to the fact that Socio cultural factors such as bathing, fishing, laundry service and swimming in contaminated water facilitates the transmission of the diseases; mainly males carry out these activities.

The highest prevalence rate (51.0%) of schistosomiasis was seen among students who use river and pond. This could be attributed to the fact that the intermediate host survives favorably in these water bodies. Additionally it is not a faecal oral infection, but the tendency is to use these water bodies also for swimming purposes and therefore increase contact with the water than those that use tap or well water.

In this study both *Schistosoma haematobium* and *Schistosoma mansoni* were detected in the students. The control measure such as targeted chemotherapy, eradication of

intermediate hosts in their breeding sites enlightenment campaigns on the transmission and effects of Schistosomiasis should be given prompt attention.

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