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Prevalence of Schistosomiasis amongst Secondary School Students in Bukuru, Du and Zawan in Jos-South, LGC, Plateau State

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ABSTRACT

A survey for Schistosomiasis was carried out among Secondary Schools students in Bukuru, Du and Zawan, both of Jos-South Local Government of Plateau State. The project work is aimed at evaluating the prevalence rate of the disease in the study area. The study was able to established the relationship between the prevalence rate of schistosomiasis and many other human variables such as age, sex, and source of water supply. 300 samples comprising of 150 stool and 150 urines were processed, using formol-ether concentration technique. Eighteen samples were positive for intestinal schistosomiasis giving a prevalence of 6%. There was no positive for urinary schistosomiasis. Sixteen cases of schistosomiasis were found in males while only two cases of schistosomiasis were found in females. Thirteen cases of schistosomiasis were found in the age group (16-20) years, while two and three were positive for schistosomiasis in the age group (10-15) years and (21-25) years respectively.

Keywords:*Parasites, Prevalence, Schistosomiasis, Students, Jos South*

INTRODUCTION

Parasites are those organisms which have adapted themselves to existence in or on another organism, which harboursthe parasite, thereby being the host [1, 2, 3]. Parasitic diseases contribute most to the retardation of socio economic development and health status of the people and constitute public enemy number one [4, 3].A chronic and debilitating parasitic disease caused by trematodes (blood flukes of the genus Schistosoma is known as schistosomiasis. [5, 6]. It is one of the commonest parasitic infections in the world [7, 8, 9].

Schistosomiasis is the second most prevalent tropical disease and a leading cause of severe morbidity in several foci in Africa, Asia and South America [6, 10] (Robert, 1993, Elsa et al., 2020). The symptoms either due to intestinal or urinary lesions depend solely on the incriminating species and the number of adult worms harboured. Species of Schistosomamansoni, japonicum and Schistosomahaematobuimcause almost 100% cases of human schistosomiasis. Additionally, Schistosomamekongi is found in South -East Asia while Schistosomaintercalatum occur in Africa. The parasites prefer fresh water snails to act as their intermediate hosts [11].

The intermediate snail host for S.haematobuimis Bulinus species. Oncomelenia snails are intermediate host for S. Japonicum and S. mansoni has Biomphalaria snails as intermediate host. [12, 2]At least more than 78 countries worldwide are endemic for schistosomiasis and people at risk of the infection are 200 million, while the infected individuals are about 200 million. More than a 100 million have mild symptoms. People with severe symptoms number more than 20 million [13, 11].

Some of the endemic areas around the world include Africa which harbours 80% of all the

schistosomiasis in the World; other countries are in the Middle -East; Venezuela and the Carribean in Latin America; China and the Phillippines in the far East [11,14]. The spread of the disease is by contact with contaminated water [15, 16, 17]. Schistosome lack a muscular pharynx and produce non operculated eggs. The fork-tailed cercariae have preoral sucker provided with organs of penetration that function both mechanically and lytically. The skin is the usual route of entry into the definitive host [18, 19].

When people that are infected with urinary and intestinal schistosomiasis urinate or defecate in water bodies that serve as source of drinking or bathing, they introduce eggs which hatch into larvae that infect the snail host, and transmission is only by contact between the population and infested water [20. 21].

Barreto [22] reported some of the various socio epidemiological factors that are responsible for the transmission of the disease and the degree of infection viz, urbanization, sanitation, water supply patterns and levels of faecal contamination of water sources, migration and the emergence of new foci, socio-economic status and distance from transmission site.Most of the people who are involved in fishing activities, farming, bathing, paddling of canoes, swimming and possibly handling of infected snails host in the causes of collecting edible ones are at high risk of the infection [23, 24, 25, 26]. The study area, Bukuru and its environs is located in Jos-south Local Government. Some pools of water resulting from the construction of roads as well as the construction of Dams for the production of Hydro -Electric power (H.E.P) thereby forming streams which are often used for the washing of household utensils and sometimes become swimming pools for children and even adults too. The project work therefore aimed at evaluating the prevalence and intensity of schistosomiasis in secondary school students in Du, Zawan and Bukuru areas in Jos South L.G.A of Plateau State, to find out the level of knowledge of the students with respect to the disease and to equally educate them on the mode of infection of the disease.

MATERIALS AND METHODS

Study Area

The study was carried out in Du, Zawan and Bukuru, the Jos South Local Government Headquarters. Most of the inhabitants of this areas are involved in farming activities, civil service and trading.

Samples Collection

This work was done between December 2001 to March, 2002. Samples were collected from students in Government Secondary School Du, Government Secondary School Bukuru and Community Secondary School, Zaman.Such information like age, sex, water sources and whether the students had gone to the river to swim recently, or he/she is passing urine/stool with blood was recorded.

Each student was given two clean, dry screw capped containers carrying the same identification number followed by letters “S” for stool sample and “U” for urine sample.

Students were instructed on the method of stool and urine collection. Urine samples were collected after exercise between 10.00am and 12 noon since greater concentration of eggs is found in the urine during this period, especially in the last drops. While the stool samples were to be collected in the early morning of the next day.Both urine and stool samples collected were taken to the laboratory, processed and examined immediately, when any delay is encountered, if the urine samples were preserved by adding few drops of 10% formal saline to each 10ml of the urine and to the stool samples and mixed very well and then processed later.

Laboratory Examination of Stool Samples

The formol-ether concentration method described by [27] Allen and Ridley was used for the preparation of the stool for examination. 1.0ml of normal saline was added to it and was emulsified thoroughly. It was filtered through a wire gauze and the filtrate was collected into a centrifuge tube. This was balanced using another tube and was spun at 300 revolutions per minute for 30 minutes. The supernatant was discarded and more normal saline was added to the deposit. It was emulsified and spun again as above. The process was repeated until the supernatant was clear. Then the supernatant was discarded and 7ml of 10% formol saline was added to the deposit and mixed well. The 3ml of ether was added to it and the tube was covered with rubber bung and was shaken vigorously. The rubber bung was carefully removed and the sample centrifuged at 3000 revolutions per minute for 5 minutes. There were four layers seen in the tube, ether, debris, formol saline and deposits.

The layer of debris was freed by rotating the tip of a wooden applicator stick between it and the side tilting the tube. The remaining fluid was mixed well by tapping the tube gently. Then drop of the deposit was place on a clean grease free slide and was covered with a cover avoiding air bubbles and over floating. It was examined at X10 and then X40 objective of the microscope for ova of intestinal schistosome.

Laboratory Examination of Urine Samples

The method described by [28] Dazoet al, was employed for the preparation of urine samples for examinations. Each urine sample was mixed very well and 10ml of it was put into a centrifuge tube and centrifuged at 3,000 revolutions per minute for 5 minutes. The supernatant was discarded. Then a drop of the deposit was placed on a clean green-free glass slide. It was covered with a cover ship, avoiding air bubbles and over floating. The preparation was then examined under the microscope using X10 and X40 objective for ova of schistosoma haematobium.

Results

Table1. *Prevalence of schistosomiasis in the study area in relation to the number of samples examined.*

Number Examined	Number positive for Schistosomiasis	Prevalence (%)
300	18	6%

Out of three hundred samples, only eighteen (18) were positive for schistosomiasis giving a prevalence of 6%

Table2.*Prevalence of intestinal schistosomiasis in the study area*

Number Examined	Number positive for Schistosomiasis	Prevalence (%)
Intestinal schistosomiasis		
150	18	0

Eighteen samples out of 150 faecal sample examined for intestinal schistosomiasis were positive. This gives prevalence of 12%.

Table3:*Prevalence of urinary schistosomiasis in the study area*

Number Examined	Number positive for Schistosomiasis	Prevalence (%)
150	0`	0

Out of 150 urine samples none was positive for urinary schistosomiasis

Table4:*Prevalence of schistosomiasis in relation to the schools studied.*

School	No of	No of samples	Prevalence
	samples examined	**Positive for schistosoma**	**(%)**
GSS. Du	100	5	5
GSS Bukuru	100	9	9
Community Sec Sch.	0	0	0
Zawan	100	4	4
Total	**300**	**18**	**6**

The prevalence of schistosomiasis in GSS Du is 5%, 9% in GSS Bukuru and 4% in CSS Zawan

Table5. *Prevalence of intestinal schistosomiasis in relation to sex*

Sex	No of samples examined	No of samples positive intestinal schistosomiasis	Prevalence (%)
Males	75	16	21.3
Females	75	2	2.6
Total	**150**	**18**	**12**

Out of 75 samples from male students (16) samples were positive for intestinal schistosomiasis while (2) samples out of 75 samples from female students were positive or intestinal schistosomiasis. Showing the prevalence of 21.3% and 2.6% respectively, as shown in table V above**.**

Table6. *Prevalence of urinary schistosomiasis in relation to sex*

Sex	No of samples examined	No of samples positive urinary schistosomiasis	Prevalence (%)
Males	75	0	0
Females	75	0	0
Total	**150**	**0**	**0**

Out of the samples examined both for males and females. There was no positive sample for either males and females. Therefore, showing prevalence of 0% as shown above.

Table7. *Prevalence of intestinal Schistosomiasis in relation to age*

Age	No of samples examined	No of samples positive intestinal schistosomiasis	Prevalence (%)
10-15	46	2	4.3
16-20	84	13	15.4
21-25	20	3	15
Total	**150**	**18**	**12**

Three (3) positive samples for intestinal schistosomiasis were from the age group of (21-25)years giving a prevalence of 15% as shown above. While thirteen (13) samples were also positive for intestinal schistosomiasis. From the age group (16-20) years giving a prevalence of

15.4%. Two (2) samples were positive for intestinal schistosomiasis in the age group (10-15) years giving a prevalence of 4.3

Table8. *Prevalence of Urinary schistosomiasis in relative to age*

Age	No of samples examined	No of samples positive urinary schistosomiasis	Prevalence (%)
10-15	46	0	0
16-20	84	0	0
21-25	20	0	0
Total	**150**	**0**	**0**

In all the 150 samples examined for urinary schistosomiasisthere was no positive in any of the age group. Therefore, no prevalence.

Table9. *Prevalence of schistosomiasis in relation to sources of water supply*

Sources of water	No of samples	No of positive	Prevalence (%)
Pine borne water	156	3	1.9
Well water	38	11	28.9
Pipe and well water	106	4	3.77
Total	**300**	**18**	**6**

The (3) positive samples were from students whose source of water is pipe-borne water giving a prevalence of 1.9%. While students whose source of water were well water, pipe and well water had 11 and 4 positive samples with prevalence of 28.9% and 3.77% respectively.

Table10. *Prevalence of other intestinal parasite in the study*

Intestinal parasites	No of samples	No of positive	Prevalence (%)
Entamoeba coli	150	6	4
Hookworm	150	10	6.66
Ascaris Lumbricoides	150	3	2

Out of the 150 samples examined 6 were positive for Entamoeba coli giving a prevalence of 4%. While Hookworm and Ascaris lumbricoides and had 10 and 3 positive samples with prevalence of 6.66% and 2% respectively.

DISCUSSION

From the results obtained in this study, only Schistosoma mansoni along with other intestinal parasites were detected. Schistosoma mansoni 18 (6%), Hookworm 10(6.6. %), Ascaris Lumbricoides 3(2%) and Entameoba coli 6(4%) were observed.

The incidence of any parasitic infection in any community depends largely on the habit and personal hygiene of the populace; and also on the foci of transmission of such an organism through the ecosystem. Based on the result gotten, most of the Schistosoma mansoni detected were from students belonging to the age group 16-20 years; giving a prevalence of 15.4%. This age group is usually made up of very active individuals of any community. The often engaged themselves in fishing, swimming and playing with water during weekends/ Holidays. The result obtained in this study clearly indicate that frequency of contact with cercariae infested water bodies dictated by household need and proximity of schools to the water bodies is a major factor in the acquisition of infection. Eighteen stool samples were positive for intestinal schistosomes, giving a prevalence of 6%. This percentage is lower than the case reported by [29] Akufongwe in other areas in Jos Plateau with the prevalence of 8% in Panyam, 28% in Jos and 35 in some primary schools. However, none out of a total of 150 urine samples examined for the presence of schistosoma haematobium was positive. The decrease in prevalence of both the intestinal and urinary schistosome could be attributed to increased knowledge of the source of infection with regards to sex, there was no positive, both males and females, in the urine sample. But the prevalence 21.3% intestinal schistosomiasis for males over weighs that of the females with a prevalence in males than in females. The reasons may be due to the fact that males are more exposed by involving in swimming, washing, paddling of Canoes, irrigations and hence, more contact with infected water bodies [25]. In relation to the sources of water, eleven cases of schistosomiasis were found among the students using well water, three and four cases for pipe water and well water respectively. This also may be as a result of contamination of wells by cercariae of schistosomes through contact with infected river/streams around. [30] in his survey in Toro, a neighbouring village near Plateau State, recorded the following results. Hookworm 12.35, Schistosoma mansoni 12.0% and Ascaris lumbricoides 3.3%. [31]Onwuliriet al, 1992 also recorded in his survey at Fier Plateau State the following; Ascaris lumbricoides 21.8%, Hookworm 17.55, Schistosoma mansoni 0.5%. The values recorded in this study are lower than those

recorded by the works mentioned above. This could be due to adequate hygienic disposal of faeces and good sanitary behaviour of the people in the locality.

CONCLUSION

Other study shows that the prevalence of both Schistosoma haematobium and Schistosoma mansoni infections is decreasing in Plateau State due to growing awareness and treatment being sought by individuals. Health education of community members including school children could become effective in the control of the disease and other parasitic infections in areas surrounding this localities and other affected areas in the State.

RECOMMENDATIONS

Based on the findings of this study. I hereby do recommend the followings:

- That adequate attention should be paid to public awareness campaign programmes, health education programmes, construction of more toilet facilities by the inhabitants of the locality, provisions of safe water for drinking and domestic use, and drainage of stagnant pools of water from the study area.
- Infected individuals in the study area should be identified through house surveys and be adequately treated.
- Finally, further epidemiological studies on schistosomiasis should be done to ascertain that the disease is not endemic in the study are

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