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A Study on Urinary Schistosomiasis Amongst The Inhabitants of Fufore Local Government Area of Adamawa State, Nigeria

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Abstract: *This study was conducted to determine the prevalence of Schistosoma haematobium in Fufore Local Government Area of Adamawa State. A total of 618 samples were collected within three months, from September to November 2014 and examined for eggs of S. haematobium using the sedimentation method. Of all the samples collected 31 were infected giving an overall prevalence of 5.02%. A significant difference ($p<0.05$) was recorded among Gender as male have a higher chance of getting infected also a significant difference was observed among the age groups with the age group 6-15years recording the highest prevalence 4.21%. Students were found to be most affected with the disease 4.53%. Primary school students had the highest prevalence of 4.69%.Though prevalence is low, it is important to increase control measures in order eradicate the disease from this region. Routine treatment and monitoring of the infected dam is recommended so as to reduce the rate of transmission of the disease.*

Key words: *Adamawa State, Inhabitants, Prevalence, Urinary Schistosomiasis.*

I. Introduction

Schistosomiasis ranks second to malaria in terms of prevalence and persistence with grave public health and socio-economic importance in endemic communities [1]. It affects almost 240 million people worldwide, and more than 700 million people live in endemic areas. The infection is prevalent in tropical and sub-tropical areas, in poor communities without potable water and adequate sanitation. Urogenital schistosomiasis is caused by Schistosoma haematobium[2], it is one of the most widely spread among the parasitic helminthic infections that affect man. It is an occupational risk disease encountered in rural areas of developing countries, where potable water is scarce [2]. These socio-economic activities are not uncommon among the inhabitants of Adamawa State, Nigeria, especially in the chosen Local Government Area 'Fufore'. There are rivers, ponds, especially constructed dams which have become favourable habitat for the snail intermediate host, most part of it lacks potable water and occupation demands that most of the population come in contact with water either for domestic, occupational or recreational purpose. The availability of the intermediate host around the water bodies makes it very important to carry out this work in the said location. Also there has been reported cases of blood in urine amongst the people and the fact that the people erroneously believe that the blood in the urine is due to prolong exposure to the sun makes it necessary to carry out this work in Fufore local Government area.

Human schistosomiasis, due to Schistosoma haematobium, is the most prevalent of the water-borne diseases, with a very great risk on the health of rural populations.In sub-Sahara Africa, 192 million are estimated to be infected with the two forms of schistosomiasis (intestinal and urinary), and Nigeria recording the largest number of infection, with about 29 million cases. Schistosomiasis is more prevalent in school-aged children, adolescents, and young adults who also suffer from the highest morbidity and mortality [3].

In the North Eastern part of Nigeria [4], reported that the overall incidence of S. haematobium was 110(14.5%), Incidence according to sex was higher in the males (517) than females (227), which were 85 (16.4%) and 25 (11%) positive respectively.A study on the prevalence of Schistosoma haematobium infection in school aged children of Konduga Local Government Area of northeastern revealed an overall prevalence of 120 (24.3%) with 95 (79.2%) as male and 25(20.8%) as female, ($p<0.05$). Prevalence was also noted to be higher among age groups between >13 and 15 years with 60 (50.0%) compared to age groups of 7-10 years with 15 (12.5%) and >10-13 years with 45(37. 5%) [5]. Also in Edo state Nigeria, [6] reported a higher prevalence for age group 6-15Years, with infection rates 36.9% - 39.9% and subsequent decrease with increasing age. A prevalence of 41.5 % has also been reported in Katsina-ala Local government area, in which higher prevalence was recorded amongst the secondary school students [7].

In Adamawa state, prevalence of 32.4% has been reported in Mayo-belwa for school aged children [8].

The Scarcity of epidemiological data on Schistosoma haematobium infection in Fufore LGA can adversely affect adequate patient evaluation, management and control programmes. This study was therefore undertaken in order to determine the Level of infection of the disease among the inhabitants. This information can be used to plan strategies for control programme for the area.

II. Area And Population Of Study

The area of this study is Fufore local Government Area of Adamawa State; Fufore is located in Adamawa State, it has a land area of 4972Km^2 and a population of 209,460 and a density of 42.1 inch. It is 26km away from yola and lies between latitude 9^o 13'N and longitude 12^o 39'E of Green which meridian. The area experiences distinct dry and wet season with temperature and humidity varying with season, average annual rainfall of 750-100mm between April to October is experienced and dry season period between November to march characterised by dry, dusty and hazy north east trade wind. Temperatures are relatively high through the year about 30 -40 ^{o}c [9]. The site of this study include: Parda, Dasin Bata and Dasin Hausa Wuro biriji, Beli chutti and Giere all in Fufore Local GovernmentArea of Adamawa State. The river Benue passed through parts of Fufore local government area and various man-made dams are found scattered in the location especially along the yola- Fufore – Gurin road which were mainly constructed during road construction.The population of the study was drawn from people working and living in these locations, Ages ranging from 6-35 years. Involvement was purely voluntary and the people were enlightened through health education on the need of the study and useful benefits of it. Those whose formal consent could not be easily obtained were exempted from the study. The control group consists of people from Beli-chutti whose location has no link with any water boy whether stream or dam and only use bore hole dug by Government as their source of water.

Consent Seeking

Clearance was gotten from the Executive Secretary of State Primary Health Agency and the Secretary of the Fufore local Government Primary Health Agency. The consent of the Ward Heads (Mai Jimilas) of the location in which the research was carried out was sought also the consent of the participants was obtained before sample bottles were distributed to each of them. The aim of the study was explained in details to the participants, mode and source of transmission, effect and control measures of the disease.

Collection And Processing Of Urinesamples

Pre-labeled screw capped plastic container was given to each participant to collect urine samples. Each participant was given a container containing few drops of 1.8% boric acid. Samples were appropriately labeled and transported in a cooler to the Adamawa German Medical Centre laboratory for Confirmatory analysis. Instruction was given to the participants to include terminal urine which should be collected between 10.00hrs and 2.00pm to suit the diurnal rhythm corresponding to the peak output of schistosoma egg [10].Laboratory analysis was done using the Sedimentation method [10].

10ml urine samples were collected from each shaken specimen bottle and spun for 10min at 2000rpm. The supernatant was gently decanted and using a clean pasture pipette, a drop of the sediments was placed on a clean grease free microscope slide covered with coverslip and examined using the ×10 and ×40 objective lenses respectively of the S. haematobium ova.

Data Analysis

SPSS version 17 was used to carry out the Chi square test for the parameters, where P>0.05 was considered significant.

III. Results

A total of Six hundred and eighteen (618) urine samples were collected, of which 31 (5.02%) showed evidence of Schistosoma haematobium infection. From TABLE 1, a total of 180 female and 438 Males were sampled with the males recording a higher number of infection 17 (2.75%) though the number sampled is more than that of the female 14 (2.27%) the prevalence per gender is higher amongst the females 7.78%. statistical analysis at P>0.05 show a significant difference between the gender with a calculated value of 0.044. The prevalence of S. haematobium infection based on the age group shows the highest among the age's 6-15years with a prevalence of 4.21% while the age group 25 – 35years recorded no infection. Statistical analysis shows a relationship between the prevalence and age where P<0.05.

Results from TABLE: 2 shows that Students recorded the highest infection of 4.53% while Civil servants, Fishermen and Farmers recorded no infection. Statistical analysis indicated no significant difference in infection as it relates to the occupation with a value of 0.054, P< 0.05 while Prevalence based on educational background showed a higher rate of infection amongst the primary school students with a prevalence of 4.69% with the

tertiary without infection. Statistical analysis shows a significant difference between the educational backgrounds of participants with a value of 0.005 at P >0.05.

Table 1: Prevalence of S. haematobium infection based on Gender, and Age in Fufore LGA of Adamawa State

Parameter	Number sampled	Number Infected (%)	Overall Prevalence (%)
Gender			
Male	438	17(3.88)	2.75
Female	180	14(7.78)	2.27
Age			
6-15	320	26	4.21
16-25	183	5	0.81
26-35	115	00	0.00
Total	**618**	**31**	**5.02**

Gender $\times^2$= 4.065, df =1, P< 0.05
Age$\times^2$= 14.568 df= 2, p >0.05

Table 2: Prevalence of S. haematobium infection based on Occupation and Educational background of participants in Fufore local Government Area

Parameter	Number sampled	Number infected	Prevalence
Occupation			
Civil servants	14	00	0.00
Students	379	28	4.53
Business men	39	00	0.00
Farmers	80	00	0.00
Fishermen	17	00	0.00
Others	58	3	0.49
Educational background			
Primary	392	29	4.69
Secondary	166	2	0.33
Tertiary	30	00	0.00
Others	30	00	0.00
Total	**618**	**31**	**5.02**

Occupation: Other refers to house wives and those without anything doing (applicants)
$\times^2$10.889, df= 3 P<0.05
Educational Background: Other Refers to those without any formal education. $\times^2$= 12.897, df =3, p>0.05

IV. Discussion

Prevalence of Schistosoma haematobium among people continues to be a major public health concern in the tropics and countries like Nigeria, the occurrence of the disease affects children's health, nutrition and learning [11].The prevalence of S. haematobium infection in Fufore Local Government Area was studied and revealed a prevalence of 5.02 %, it is lower than some cases reported in the country, [5][12][13][14]. The difference in prevalence may be due to difference in ecological characteristics and the varying water contact activities of the different locations. This low prevalence might be as a result of the availability of alternative sources of water like the borehole, tap and well in the locations, also increase awareness about the danger of the disease as well as availability of health facilities in places visited. The results is consistent with the work [14] [15][16] who reported a prevalence of 2.07% ,5.5% and 6.4% respectively.

This study showed a significant difference in prevalence (P <0.05) amongst the gender with females having a prevalence of 2.27% and male 2.75%, this disagrees with the reports [13] [15]. which shows no consistent pattern attributable to gender (sex difference) with respect to infection but the status of infection depends on the water contact pattern of the individual whether male or female, i.e. when gender influence water use and contact; but agrees with the report [17][18][19], who claim that male have a higher chance of infection than females. The difference in this report could be due to the fact that the females are not so actively involved in the water contact activities like their male counterparts, they live a more restricted life as culture and religion does not permit the female folks such liberty.

Furthermore, a significant difference was recorded between the age group P<0.05, the highest prevalence was recorded amongst the age group 6-15 with a prevalence of 4.21% (26 cases), the age group 16 - 25 recorded 0.81% (5 cases) and the age group (25- 35) did not record any infection this report correspond to the work [6][13][14][20]. It disagrees with [21] who recorded the highest prevalence 22.2% in the 21-30 age groups. This report shows that the prevalence of S. haematobium in Fufore Local Government Area is age specific. This might be as a result of the constant recreational activities common among this age group who are very active and spend more time in these dams for swimming, playing and carrying out domestic chores , it is

not surprising because they are more commonly found in prolonged contact with water bodies for various reason like as listed above the other age group are either too young (0-5years) to be actively involved in the water contact activities or too old (26year and above) especially that most of the water bodies in the locations are not rivers or streams but man-made artificial dams, whose water are stagnant. Most adult would have no use of it. People in such age group find alternative means of recreation [22].

In this study, in relation to Occupation of the inhabitants, it shows a significant difference with $P< 0.05$ (0.054) more students are infected compared to other occupation this agrees with the work [13]. The low value for civil servants and business men could be as a result of their limited contact and lack of involvement activities that exposes them to the water bodies i.e. they neither go too far nor visit streams, ponds or dams for their domestic or recreational activities. The low value of the farmers and fishermen may be due to the fact that most of the farmers farm during the rainy season and in the inter land, apart from farmers in Dasin Hausa and Dasin bwatye, most infection are recorded from man-made dams and not from the river where fishing and farming activities take place. This low infection amongst farmers and fishermen disagrees with the work of [13] who reported a prevalence of 22% for fishermen, 85.7% for farmers in Zamfara State,Gusau. It is in line with the report of [23] who reported high prevalence of 73.1% among school students.

The prevalence of infection with respect to the Educational background of respondents of the study give a significant difference $P<0.05$. The highest infection was among the primary school, with a prevalence of 4.69% and the tertiary recorded no infection this could be attributed to their level of education and enlightenment, while the primary level are still not well enlighten Which goes to show the significant of education in the fight against disease. The high infection rate in the primary and secondary might be associated to their level of education or awareness as it relates to S. haematobium infections and the water contact activities as no educated person would be comfortable in those dams covered with weeds and water plants. This research is in line with [4] who reported 14.5 % in primary school people in Maiduguriand Contrary to [7] who reported higher prevalence for secondary students than primary students reasons could be because in his case which was a farming community, the secondary students are stronger to work more on the farms therefore increasing their water contact activities.

V. Conclusion

In conclusion, this study has indicated a low prevalence 5.02% of urinary Schistosomiasis infection among the people in the study area, No such information to the knowledge of the Author is available in the location, therefore it is important increase effort to further reduce and prevent an increase in the future, also routine surveillance, and treatment should be done to reduce the menace. Government should regularly disinfect ponds and streams, treat school children and emphasize on school health education programmes even in primary schools.

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