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CO-HORT STUDY OF URINARY SCHISTOSOMIASIS AMONG TWO VILLAGES RESIDING ALONG HADEJIA VALLEY, JIGAWA STATE, NIGERIA

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ABSTRACT
A study was carried out to determine prevalence of urinary Schistosomiasis among two villages located along Hadejia valley in Jigawa State, Nigeria. A total of 125 urine sample from people residing in each of the two villages (Yamidi and Shawara), were screened for the presence or absence of S. haematobium eggs. Urine sample were screened using Concentration Sedimentation Technique. The overall prevalence of S. haematobium infection in Yamidi was 76.8% with mean Eggs per cubic Centiliter (EPC) of 2.9, and in Shawara the overall prevalence was 77.6% with mean EPC of 3.4. Males were found to be more infected than female in both the two villages. People aged 1 to 5 years have highest prevalence of the infection in both the two villages than people among older age group. People with haematuria have highest prevalence of 95.1% and mean EPC of 6.0 than people without haematuria that have lower prevalence of 72.0% and mean EPC of 3.4.There was no significant relationship (p > 0.05) between the infection and presence or absence of haematuria. This study has established that urinary schistosomiasis is endemic in the study area.
Keywords: Hadejia, Haematuria, Infection, Jigawa, Nigeria, Schistosomiasis.

INTRODUCTION

Schistosomiasis is a major parasitic disease caused by trematode of the genus Schistosoma and is a major health problem. Urinary Schistosomiasis is a form of parasitic diseases, characterized by blood in the urine. Globally Schistosomiasis affects 78 countries, out of which 52 are at risk of the infection (WHO, 2013). About 243 million people are affected and more than 700 million live in endemic area of the disease and of those numbers, about 200,000 to 300,000 people die annually and most affect people in the developing countries (Yusuf*et al.*, 2015). Nigeria is one of the highly endemic countries where the disease has been reported and large areas remain where the disease status is known. Schistosomiasis is associated with poverty and poor living conditions inadequate sanitation and poor water supply as well as unplanned water resources development (Balla*et al.*, 2015).

Schistosomiasis transmission increased over the years. This has been due to large scale irrigation, which created new habitat for snail intermediate host (WHO, 2010). There were increased rate of infection due to exposure pattern associated with bathing, washing and farming along river and canals harbouring infected snail intermediate host (Iwu*et al.*, 2015). The study was aimed to assess prevalence of urinary Schistosomiasis in the study area.

MATERIALS AND METHODS

Study Area

The study was carried out between May and June 2015 in two villages located around Hadejia valley Jigawa State, Nigeria. The villages are Yamidi and Shawara respectively. The sites are 2 kilometres away from river Hadejia and are selected in order to establish relationship between prevalence and mean EPC of the infection in the study area. Hadejia Local Government is located in the north eastern corner of Jigawa State. It lies between 9^0 37' E and 10^0 35' E Longitude and 13^0 02' N Latitude. The climate of the region is wet and dry type, rainfall spread between June and September with mean Annul rainfall of 315mm. The soil in the study area is sandy in nature except in Fadama area that has clay soil. River Hadejia provide water for irrigation and fish production. People in the area are farmers that grow both rain fed and irrigated crops and some are animal rearers (Wikipedia, 2000).

Study Population

A total of 125 people were screened for the presence or absence of urinary Schistosomiasis in both the selected villages. The people are both young and adult of both sexes. The purpose of study was carefully explained to the subjects in order to obtain their consent.

The subjects were asked to provide urine samples between 10:00am to 2:00pm for examination when excretion of eggs is greatest (Cheesbrough, 2004).Urine samples were collected a long with personal data that consist ofnames sexes, address, and presence or absence of haematuria from each subject.

Procedure for Urine Examination

Quantitative examination of single urine specimen was done using modified concentration sedimentation technique for the detection of eggs of *S. haematobium* (Attah, 2000; Eldryd, 2004; Cheesbrough, 2004). The subjects were given specimen bottles for sample collection. The urine sample was preserved with three drop of Hypochlorite and later transported to Biology Laboratory, Binyaminu Usman Polytechnic, for the detection of eggs. Ten millilitres (10ml) of the urine sample was collected in a clean dry container. It was then placed into a centrifuge machine for centrifugation; RCF = 44.72g. The supernatant was discarded and a drop of the sediment was placed on the glass slide and covered with cover slip. It was then examined microscopically using low power time (×10) objective lens .The numbers of eggs in the preparation were counted and recorded. The intensity of infection was expressed as Mean Eggs per Centilitre (Mean EPC). From 0-20 eggs count was considered to be low infection. 21-49 was considered to be moderate infection and 50 and above was considered to be severe infection.

Data Analysis

Chi square (X^2) test was used to determine association between variables (prevalence, sex, age and haematuria) their degree of significance at 95% confidence interval. Using Instat Dataset version 2006. Values were considered significant at $p < 0.05$.

RESULTS

Result of this study showed prevalence of Schistosomiasis in the study area. One hundred and twenty five 125 urine samples were examined in each village. In Yamidi 86(68.8%) were males while 39(31.2%) were females. But in Shawara 99(79.8%) were males and 26(20.8%) were females (Table 1). Table 2 showed prevalence of Schistosomiasis according to sex in the study area. Overall prevalence of urinary Schistosomiasis in Yamidi is 76.8% with Mean EPC of 2.9, while in Sharawa the overall prevalence was 77.6% with Mean EPC of 3.4. In Yamidi males were found to have higher prevalence 72(83.7%) with mean EPC of 3.5, but females has lower prevalence 24(61.5%), with mean EPC of 2.3. Similarly in Shawara males were found to have higher prevalence 75(76.0%) with mean EPC of 3.9, but females has lower prevalence 12(46.2%) with mean EPC of 2.9. There was no significant relationship ($p > 0.05$) between the sex and prevalence of the infection.

Table 3 summarizes Prevalence and Mean EPC of the infection according to age in the study area. In Yamidi people aged 1 to 5 years have higher prevalence of (85.0%) with Mean EPC of 3.1. Similarly in Shawara higher prevalence was recorded among people aged 1 to 5 years (83.0%) with Mean EPC of 3.7. It is followed by people aged 6 to 14 years in Yamidi with prevalence of (75.0%) and Mean EPC of 4.6. but in Shawara the prevalence is (73.1%) with Mean EPC of 3.8. People aged 15 years and above in Yamidi have lowest prevalence of (44.4%)with mean EPC of 3.7. Similarly in Shawara prevalence of the infection was lower (14.3%) with Mean EPC of 0.5. There was no significant relationship ($p > 0.05$) between the age and prevalence of the infection. Table 4 showed relationship between haematuria, prevalence and Mean EPC of the infection in the study area. People with haematuria have highest prevalence of 95.1% and Mean EPC 6.9, than people without haematuriathat have lowest prevalence of (73.7%) and Mean EPC 3.4. There was no significant relationship ($p > 0.05$) between presence or absence of haematuria and infection. The few people without haematuria 2(4.9%) that are not infected suggest other cause of haematuria.

Table 1.Occurrence of Schistosomiasis among Subjects According to Gender

Sex	**Yamidi**	**Shawara**
Male	86 (68.8%)	99 (79.2%)
Female	39 (31.2%)	26 (20.8%)
Overall	125 (100%)	125 (100%)

Table 2. Prevalence and Mean EPC of Schistosomiasis According to Sex of the subjects

	Yamidi				**Shawara**			
Sex	**NE**	**NI**	**PR**	**MEPC**	**NE**	**NI**	**PR**	**MEPC**
Male	86	72	83.7%	3.5	99	75	76.0%	3.9
Female	39	24	61.5%	2.3	26	22	46.2%	2.9
Overall	125	96	76.8%	2.9	125	97	77.6%	3.4

Key: NE=Number Examined, NI= Number Infected, PR= Prevalence, MEPC= Mean Eggs per Cubic Centilitre. There was no significant relationship ($p > 0.05$) between the sex and prevalence of the infection.

Table 3. Prevalence and Mean EPC ofSchistosomiasis According to Sex of the Subjects

	Yamidi				Shawara			
Age	**NE**	**NI**	**PR**	**MEPC**	**NE**	**NI**	**PR**	**MEPC**
1-5	53	45	85.0%	3.1	40	37	93.0%	3.7
6-14	63	47	75.0%	4.6	78	57	73.1%	3.8
15-Above	9	4	44.4%	3.7	7	3	14.3%	0.5
Overall	125	96	76.8%	3.8	125	97	77.6%	2.6

Key:NE=Number Examined, NI= Number Infected, PR= Prevalence, MEPC= Mean Eggs per Cubic Centilitre. There was no significant relationship ($p > 0.05$) between the age and prevalence of the infection.

Table 4. Relationship between Haematuria, Prevalence and Mean EPC of Schistosomiasis in the Study Area.

Status of Haematuria	**NE**	**NI**	**PR**	**Mean EPC**
Presence	41	39	95.1%	6.9
Absence	209	154	73.7%	3.4
Overall	250	193	77.2%	5.15

Key:NE=Number Examined, NI= Number Infected, PR= Prevalence, MEPC= Mean Eggs per Cubic Centilitre. There was no significant relationship ($p > 0.05$) between the haematuria and prevalence of the infection.

DISCUSSION

In the present study, the overall prevalence of urinary Schistosomiasis in Yamidi and Shawara was 83.7% and 77.6% respectively, with Mean EPC of 2.9 and 3.4. This study has shown high prevalence of the disease in the study area. The Mean EPC was low in both the two villages (Table 2). The high prevalence may be attributed to the presence of surface water and Yamidi irrigation scheme in Hadejia valley, which enables the inhabitants to engage in human water contact activities, such as irrigated farming and fishing (Duwa, 2007). The study area warrant mass chemotherapy since the value obtained is greater than 50% prevalence, recommended by the World Health Organization as the threshold for mass chemotherapy (WHO, 1993).The prevalence in the present study is higher than the report of Bichi and Abubakar (2009) who reported 66.9% prevalence. The prevalence in the present study is also lower than the report of *Geleta et al,* (2015),who reported Prevalence of 35.9% in Abobo area Gombella in Ethiopia. *Iwu et al.,* (2015) reported 9.2% prevalence rate among primary school children, which is much lower than the value obtained in the present study.

The prevalence and mean EPC of *S. haematobium* infection was found to be higher in males than in females in both two villages (Table 2). Higher prevalence in males might be due to the fact that males are engaged in irrigation farming and fishing than females. This makes males to have more water contact activities. This assertion is in conformity with the work of Idris *et al.*(2001) who reported higher prevalence in males (15.34%) than females (7.44%), in prevalence study conducted in Katsina State, Nigeria. The work in the present study is in agreement with the work of Iwu*et al.*(2015), who reported higher prevalence in males (28%) than females (17.2%). In a research conducted among school children in Ehiomo Local Government of Imo State Nigeria, This implies that *S. haematobium* infection is not gender specific disease but rather occur as a result of exposure contaminated water (Bichi and Abubakar, 2009). Prevalence and Mean EPC of *S. haematobium* infection was found to be higher in children aged 1 to 5 years and 6 to 14 years in both the two villages (Table 3) while lowest prevalence and Mean EPC was obtained among people aged 15 years and above (adult) in all the two villages.

Higher prevalence and Mean EPC found in children associated with high water contact activities and lower prevalence and Mean EPC found in adult may be due to either decrease in transmission rate due to reduced water contact activities or reduced survival of the parasite already in the human host which might be characterized by acquired immunity to the parasitic infection as reported by Show(1999).

Haematuria detected and diagnosed positive in this study indicated high prevalence(95.1%). with Mean EPC of 6.9, than the other counterparts without haematuria that were diagnosed to have lower prevalence (73.7%) and Mean EPC of 3.4. The prevalence reported in the present study is similar to the report of Abdullahi (2005) which indicated 92.3% prevalence among those with haematuria. The value obtained in the present study is higher than the value reported by Abubakar *et al.* (2015) that reported 88.8% prevalence. The failure to find eggs of *S. haematobium* in such insignificant number of people (4.9%) suggest other causes of blood in urine such as menstruation, urinary tract infection, haemorrhoid, glomerular nephritis or circumcision (Andrew and Alicia, 1999; Abubakar, *et al.,* 2015).

Adewumi (1991) also reported that it could also be caused also by menstruation, glomerular nephritis and pile.

CONCLUSION

This study has established that urinary schistosomiasis exist in the study area, which is attributed to human water contact activities by the inhabitant. Males were found to be more infected than females; while children were found to be more infected than people with older age group and people with haematuria have highest prevalence of the infection than people without haematuria.

Recommendations

- There is a need to enhance health education programme among school children, who are ignorant about the mode of transmission despite their knowledge of the disease.
- Mass chemotherapy and social mobilization should be promoted in the area

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