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PREVALENCE OF URINAR SCHISTOSOMIASIS AMONG PUPILS ATTENDING ANGWAN LAMBU PRIMARY SCHOOL, KEFFI, NASARAWA STATE, NIGERIA

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ABSTRACT

This research aims to investigate the prevalence of urinary tract schistosomiasis among pupils of Angwan Lambu Primary School in Keffi Local Government Area of Nasarawa State conducted from June to September 2021. One hundred and fifty (150) urine samples were collected from the pupils and brought to the laboratory for parasitological examination of schistosome eggs using sedimentation method. The overall prevalence of schistosomiasis was 23(15.33%). The prevalence of urinary schistosomiasis was significantly higher (P > 0.05) in male 15(10%) than the female 8(5%). There was no significant association (P > 0.05) in the prevalence of urinary infection between genders and age. The results of the study showed highest prevalence in age group 7-9 (6%) followed by age group 10-12 (5%) while the lowest prevalence was observed among age group 4-6 (2%) which revealed the prevalence of *S. haematobium* in the study area. Therefore, periodic chemotherapy of the affected populations with praziquantel, improved health education, provision of portable water, adequate sanitation and control of fresh water snails will reduce the risk of morbidity and disease transmission in the area.

Keywords: Prevalence, *schistosomiasis*, sedimentation, transmission, praziquantel, school

INTRODUCTION

Urinary tract schistosomiasis commonly called bilharziasis is a snail borne, fresh water transmitted neglected tropical disease (NTD) of poverty particularly in sub-sharan Africa, the Middle East, Asia as well as Latin America (WHO, 2018). *S. haematobium* is the causative organism of urinary schistosomiasis that infected about 112 million individuals in sub-Saharan Africa (WHO, 2020). About 71 million of the infected individuals experience haematuria, with half of which have dysuria, and around 18 million suffer from urinary bladder pathology annually (WHO, 2020). The disease ranks second to malaria in terms of public health importance, killing an estimated population of about 280,000 people annually in the African continent (CDC, 2011). Freshwater snails (gastropods) in the genus *Bulinus* are the suitable intermediate hosts to *S. haematobium.* Humans become infected through skin penetration when it comes in contact with an infective stage of the parasite (cercariae) during various activities in infested water (NaTHNaC, 2014). Lack of access to clean water, poor sanitation and human activities such as swimming, fishing, washing and bathing around contaminated water bodies can put children, adolescents and adults at risk of infection (Abebe, 2014). Urinary schistosomiasis infections may lead to different clinical manifestations such as blood in urine, anemia, bladder cancer, nutritional deficiencies, stunted growth in children as well as decreasing physical activity, school performance, work capacity and productivity(Stephenson, 1993; WHO, 2002). Therefore, control measures including environmental modifications such as digging water drainage ditches or tunnels to flood, bury the snail habitats or through the use of niclosamide can be an important focus of prevention (Chidi *et al*., 2006; Imran *et al*., 2014)**.** The aim of the study was to investigate the prevalence of urinary schistosomiasis among pupils attending Angwan Lambu Primary School in Keffi Local Government Area of Nasarawa State, Nigeria.

MATERIALS AND METHODS

Study Area

This study was carried out at Angwan Lambu Primary School Keffi, Nasaraw State, Nigeria. Keffi Town is located on latitude 8° 50' 43" N and longitude 7° 52' 37" E. The area falls within the tropical savanna climate of Nigeria and about 50 kilometers from Abuja. The population of the area was estimated to be 92,664 people as of 2006 census. Streams and rivers were the major water sources for domestic use in the study area.

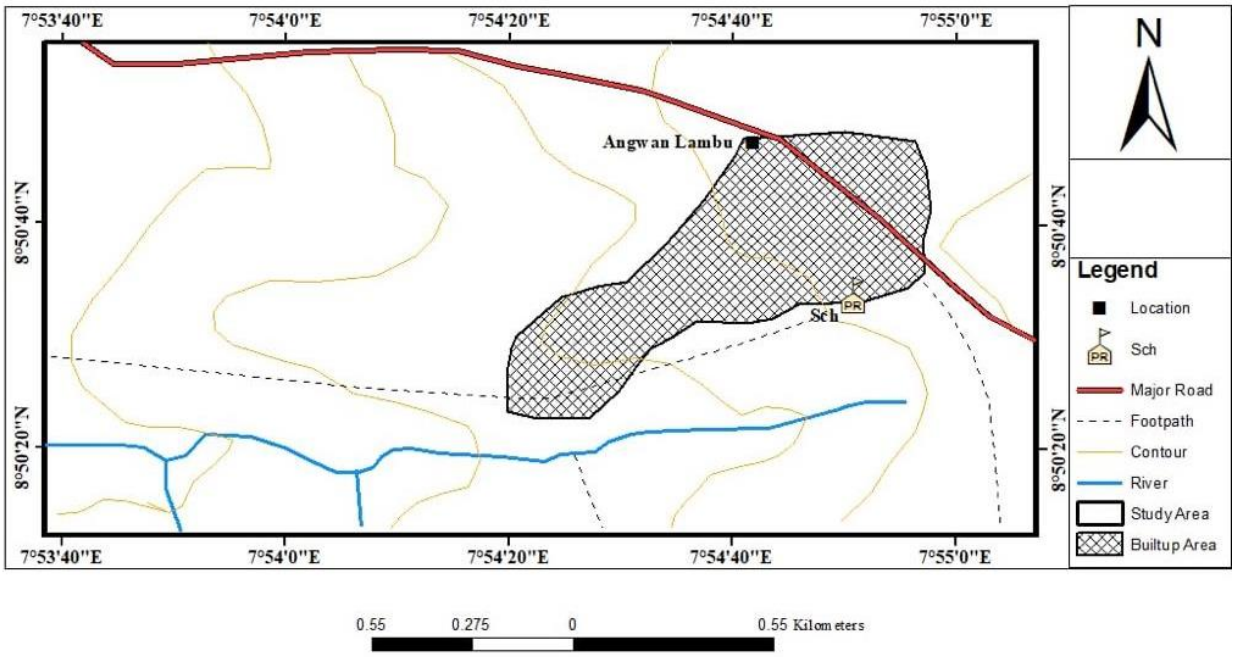

Figure 1: Map showing the study Area

Collection of Urine Samples

One hundred and fifty (150) urine samples were collected in labelled sterile corked plastic tubes given to each pupil between 7-10am on each collection day (Cheesbrough, 2005). The samples were brought to the Zoology Laboratory, Faculty of Natural and Applied Sciences, Nasarawa State University, Keffi for analysis.

Laboratory analysis

The urine samples were analyzed for the presence of *S. haematobium* eggs by sedimentation and centrifugation methods. About 10ml of urine sample was transferred to the test tube and centrifuged at 1,500rpm for 5 minutes to sediment the schistosome eggs. The supernatants fluid of the centrifuged urine was discarded and the sediment transferred to the Centre of a clean grease-free slide using a Pasteur pipette and covered with a cover slip. This was mounted on a light microscope and examined at 10 x 40 magnification for detection of morphological structure of the schistosome eggs observed and the results were expressed as the number of *S. haematobium* eggs/10 ml urine sample.

Data analysis

Data obtained were analyzed statistically by descriptive statistic using Statistical Package for Social Sciences (SPSS) software version 20.0 at $P > 0.05$ level of significance. Chi square ($\chi 2$) test was used to test possible association of infection with respect to age and sex and the result was statistically not significant ($P > 0.05$).

RESULTS AND DISCUSSION

From the total number of one hundred and fifty (150) urine samples examined for the presence of *S. haematobium* ova, only 23 (15.33%) pupils were infected ((Table1). The highest prevalence was observed in primary three 8(5.3 %) followed by primary two 5(3.3 %) while primary five had the lowest prevalence infection rate of 2.0% (Table1).

Table 1: Prevalence of Urinary *schistosomiasis* by class among Angwan Lambu primary school pupils

Class	No. examined	No. infected	Prevalence (%)
One	31(20.67%)	4(2.67%)	2.7
Tow	22(14.67%)	5(3.33%)	3.3
Three	50(33.33%)	8(5.33%)	5.3
Four	23(15.33%)	4(2.67%)	2.7
Five	24(16.0%)	2(1.33%)	2.0
Total	**150(100)**	**23 (15.33%)**	**(15.33%)**

$\chi 2 = (p>0.05)$

Table 2: Prevalence of Urinary *schistosomiasis* by gender among Agwan Lambu primary school pupils

Gender	No. examined	No. infected	Prevalence (%)
Male	88(58.67%)	15(10%)	10
Female	62(41.33%)	8(5.33%)	5
Total	**150**(100%)	**23(15.33%)**	**15**

$\chi 2 = (p>0.05)$

Table 2 shows the prevalence of infection in relation to gender. The results indicate that male participants has the highest prevalence (10%) compared to females (5.3%). Urinary schistosomiasis infections were not significantly different between gender ($P < 0.05$) even though male had

higher prevalence of 10% than female with 3% but these figures were not significantly different ((P < 0.05).

Table 3: Prevalence of Urinary schistosomiasis by age groups among Agwan Lambu primary school pupils

Age (years)	No. examined	No. infected	prevalence (%)	X^2	p=value
4-6	28(18.7%)	3(2.0%)	2		
7-9	75(50.0%)	9(6.0%)	6	2.533	0.085
10-12	37(24.7%)	7(4.7%)	5		
≥13	10(6.7%)	4(2.7%)	3		
Total	**150(100%)**	**23(15.4%)**	**16**		

χ2 = (p >0.05)

Table 3 shows the prevalence of infection in relation to age. The age group 7 – 9 years had the highest prevalence (6 %) followed by the age group 10-12 (5%) years while the least prevalence of infection was observed in the age group 4-6 (2%). The results showed that the age of the pupils has nothing to do with the prevalence of urinary schistosomiasis (p >0.05).

DISCUSSION

Schistosomiasis is a major ongoing public health issue in Nigeria. The major risk factors for schistosomiasis control and prevention are lack of knowledge, attitudes and practices (KAP) about schistosomiasis and how it is transmitted in endemic areas**.** Various factors including climate change, flooding and manmade structures, particularly dams, can affect the habitats and spread of the infection by expanding snail habitats and increasing transmission (McManus *et al*., 2018). The snails are considered to be intermediate hosts because humans harbour the sexual stages of the parasites and the snails harbour the asexual stages. The present study revealed that the overall prevalence of urinary schistosomiasis in the study area was 15.33% with no significant difference (p >0.05). Ekpo *et al*. (2010) reported 58.1% prevalence among preschool children in a community near Abeokuta South-western Nigeria. Similarly, Ugbomoko *et al.* (2010) reported a prevalence of 62% in two per-urban communities in south-western Nigeria. In our findings, females were less affected than males as they had little contact with natural water (Appleton *et al*., 2012). This could be attributed to religious, cultural practices and other life styles in the area but significantly higher prevalence was reported among females 23.13% in comparison to males 22.52% in Ghana (Nkegbe, 2010). Contradictory reports in respect to gender prevalence as reported by Singh and Muddasiru (2014)) indicate that schistosomiasis was more pronounced among male (79.59%) compared to the female population (20.41%) in Sokoto. The low prevalence (15.33%) observed in our findings was in accordance with the work of Ekejindu *et al.* (2002) in Anambra State (11.8%), Okoli (2015) in Ibadan (17.4%). The results of our findings further revealed that the prevalence of infection was higher among participants aged 7-9 years (6.0%) compared to those aged ≥13 (2.7%)) years. The lowest prevalence rate (2%) was observed in age group 4-6 years. Generally, the lower prevalence observed by the present study is an indication that urinary schistosomiasis has declined probably due to the integrated and cost-effective approaches implemented by the Federal Ministry of Health to eliminate multiple Negletated Tropical Diseases (NTDs) in Nigeria.

CONCLUSION

In conclusion, this study revealed that 15.33% of the participants were found to be positive for chistosomiasis which confirmed the present of urinary chistosomiasis in the study area. The gender disparity in the prevalence of infection with males having the highest infection rate than the females counterpart observed during the study is more likely that males were exposed to water contact activities such as swimming, fishing and farming than the females. The World Health Organization (WHO) has highlighted education as part of strategic plan for schistosomiasis control. Therefore, pairing education with health and hygiene infrastructures, access to safe drinking water, provision of toilets to increase sanitation and decrease environmental contamination with egg will eventually eliminate urinary schistosomiasis from the area. Snail control through the use of chemicals such as niclosamide as well oral chemotherapeutics with praziquantel (PZQ) can effectively reduce the prevalence and intensity of schistosomiasis transmission significantly.

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