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URINARY SCHISTOSOMIASIS INFECTION IN DUMBIN DUTSE, IGABI LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA.

*KANWAI, S.[1], NDAMS, I. S.[1], KOGI, E. [1], GYEM, Z. G. [2] , HENA, J. S.[1]

[1]Department of Biological Sciences,
[2] University Health Services,
Ahmadu Bello University, Zaria, Nigeria.
*swanyiin@yahoo.com

INTRODUCTION

Urinary schistosomiasis or bilharzia is a tropical parasitic disease caused by blood-dwelling fluke worm *Schistosoma haematobium* (WHO, 2007). It is endemic in 53 countries in the Middle East and most of the African continent (Chitsulo, *et al.,* 2000). It is still one of the major public health problems facing humanity, with severe social and economic consequence (WHO, 1999). The global prevalence showed that over 139 million people are infected with 85% of them occurring in Africa (WHO, 1999).

Nigeria is one of the countries known to be highly endemic for urinary schistosomiasis with more than 100 million at risk and about 25 million people already infected (Chitsulo *et al.,* (2000). Although the majority of people in endemic areas have only light infections or no symptoms, the impact of urinary schistosomiasis on economic condition and the general health situation is much (Chidozie & Duniyan*,* 2008). The disease is known to affect the work capacity of rural inhabitants owing to the weakness and lethargy it induces as well as affect the performance and growth patterns of infected school children (WHO, 1999, WHO, 2004, Uneke *et al*., 2007).

Study Area: Dumbin Dutse, Igabi Local Government Area in Kaduna State is a community of settled and semi-settled Fulani whose occupations are mainly farming and cattle rearing. It comprised of six hamlets, namely; Angwan Sarki, Angwan Kastinawa, Angwan Majima, Dumbin Ladan, Angwan Sullubawa and Sabon Gida. The area has a netwok of ponds and streams some natural while others are man-made The ponds accumulate water and remain perennial which is essential for snail breeding and also serve as major sources of water used by the inhabitants

Urine samples collection: Sterile specimen bottles were given to selected individuals for the study who were advised on how to collect the urine samples. A total of 657 urine samples were collected between 10:00 am and 14:00 pm, (Lucas & Gilles, 1990). The sampled population included males and females of all ages. The specimen bottles were labeled with same identification codes to match with the one on the questionnaire. A drop of bleach was added to each specimen and transported in a cold box containing ice blocks to the laboratory for analysis.

Questionnaire: A total of 657 questionnaires were administered to consenting individuals recruited in the study to obtain their bio-data, occupation, types of activities at the pond

Urine analysis and examination: Each urine sample was concentrated by centrifugation during which 10 ml of urine was taken and span at 500 rpm for 5 minutes. The supernatant was discarded and the sediments examined at x40 magnification under the microscope. Eggs were detected and identified by the shape and terminal spine haracteristic for *S. haematobium* (Feldmeier & Poggensee, 1993). Positive samples are counted and recorded as number of eggs per 10ml urine (no eggs/10ml urine).

Mapping and distance: Coordinates of the ponds and the settlements were taken using the Global Positioning System (GPS) to determine the distance of the hamlets to the ponds. Mapping was done using the enhanced thermatic mapper (ETM) 2005 version.

A total of 657 individuals from the six hamlets were examined for the ova of *S. haematobium*, of which 165(25.11%) were positive. Results from the hamlets showed that Dumbin Ladan had the highest prevalence of 87(60.80%), while Angwan Kastinawa 69(56.60%), with Angwan Sarki and Angwan Majima having the lowest prevalence of 1(0.60%) each. Odd's ratio revealed significant association between Dumbi Ladan (OR=8.68(5.63,13.4)) and Angwan Kastinawa (OR=5.95(3.83,9.27)) with the prevalence of the infection as presented in Table 1.

The prevalence according to sex shows that the males 126(37.61%) had a higher prevalence than the females 39(12.11%), there was a significant association between sex and the prevalence of the disease, $\chi 2=64.51$, $P<0.05$. The intensity of the females (77.82±48.96) was higher than the males (72.73±16.77) as shown in Table 2.

The 11-20 years age group had the highest prevalence and intensity of 44.50 % per 10ml urine, the lowest was in the 41+ years age group with a prevalence of 0.9%. This indicates a decrease in the prevalence of the disease with increase in age. There was a significant association of the 11-20 age group with the prevalence of the disease at $P<0.05$, OR(CI)=3.73(2.52,5.53), while the 21-30 age group showed association which was not significant as presented in Fig.1

TABLE 1. THE PREVALENCE OF URINARY SCHISTOSOMIASIS IN DUMBIN DUTSE

Hamlets	No. Sampled	No. Infected	Prevalence (%)	Odd Ratio(95%CI)	χ2	P-value
Dumbin Ladan	143	87	60.8	8.68(5.63,13.4)	121.2	0.0000*
Angwan Sarki	168	1	0.6	0.01(0.00,0.08)	70.41	0.0000*
Angwan Kastinawa	122	69	56.6	5.95(3.83,9.27)	76.72	0.0000*
Angwan Majima	172	1	0.6	0.01(0.00,0.08)	72.81	0.0000*
Sabon Gida	33	3	9.1	0.29(0.07,0.99)	3.89	0.0486*
Angwan Sullubawa	19	4	21.1	0.79(0.22,2.59)	0.02	0.0040*

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TABLE 2. PREVALENCE OF URINARY SCHISTOSOSMIASIS INFECTION IN DUMBIN DUTSE ACCORDING TO SEX

Sex	No. sampled	No. Infected	Prevalence (%)	Odd Ratio (95%CI)	Chi square(χ2)	P-value
Male	335	126	37.61	4.88(3.21,7.45)	64.51	0.0000*
Female	322	39	12.11	4.88(3.21,7.45)	64.51	0.0000*

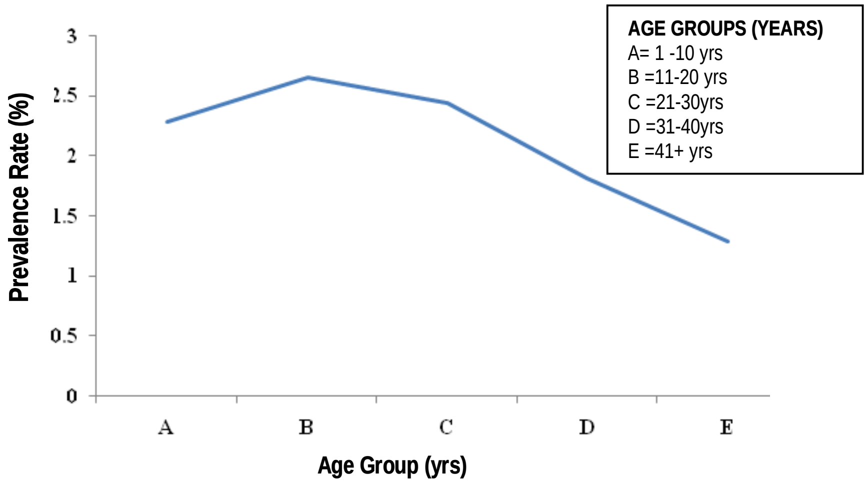

FIG. 1. MEAN INTENSITY OF URINARY SCHISTOSOMIASIS INFECTION ACCORDING TO AGE IN DUMBI.

The overall prevalence of infection recorded at Dumbin Dutse falls within the WHO classification of endemicity (WHO, 2002). This result also agrees with a number of reports Okpala *et al.,* (2004), Nmorsi *et al.,* (2005), Okoli *et al.,* (2006) and Uneke *et al.* (2007), which consistently show increase in the endemicity of *Schistosoma haematobiumn* in Nigeria. The prevalence of urinary schistosomiasis in Dumbin Dutse can be attributed to low literacy level, lack of basic amenities, inadequate and indiscriminate disposal of human sewage, proximity to infested water bodies and high water contact activities in the snail infested ponds (WHO, 2007).

The highest prevalence at Dumbin Ladan could be due to the presence of the infested ponds within the hamlet and that serve as the major source of water for domestic purposes. The low prevalence recorded at Angwan Sarki and Angwan Majima could be due to availability of borehole which supplies them with safe water for their domestic use, thereby reducing their contact with the infested pond, thus, reducing the risk of infection. This shows the important role safe water supply plays in the control of urinary schistosomiasis by Udonsi *et al.*, (1990), Okoli *et al.,* (2006,) WHO, (2007) and Uneke *et al.*, (2007).

There was significant association between sex and the disease with more males infected than females. This could be due to socio-cultural and religious factors that expose males to activities at the infested ponds, such as fishing, watering the cattle, swimming and bathing, thereby increasing their rate of exposure to infection. (Okoli *et al*., 1999, Uneke *et al.,* 2007, Ndvomugyenyi *et al.,* 2001).

The prevalence rate recorded according to age shows the 11-20 age group as having the highest prevalence, while the lowest was recorded in persons above 40 years old. The prevalence rate of the disease showed a strong negative correlation (-0.9) with age indicating a decrease in prevalence with increase in age. This could be due to the fact that young children are often involve in more activities that bring them to infested ponds, such as watering of the cattle, washing and bathing. The decrease in prevalence rate with increase in age could also be due to reduced water contact and increased immunity with increase in age as reported by Okoli *et al.,* (2006) and Uneke *et al.,* (2007).

This work also highlights the significance of proximity of humans to infested ponds, as settlement closer to pond A (Dumbin Ladan 1) had the highest prevalence rate while those furthest away (Angwan Sarki and Angwan Majima) had the lowest infection rate. The distance of the hamlets negatively correlates with the prevalence rates, thereby indicating a decrease in prevalence rate with increase in distance especially from pond A. This result agrees with reports by Gong *et al*., (1999) and Clennon *et al.,* (2004) who advocate the use of GIS to identify transmission hot spots and which will make it easier to locate and channel the few resources available for control of the disease.

CONCLUSION

Prevalence of *Schistosoma haematobium* eggs in Dumbi, reveals that urinary schistosomiasis is endemic in the settlement. The difference in prevalence rate among the six hamlets studied could be attributed majorly to proximity to source of infection (ponds), poor sanitation, high illiteracy level and lack of safe water supply for domestic use. This work recommends the use of the Geographic Information System (GIS) to show the spatial pattern of human infection at the same time with those of the snail intermediate host; this will make the allocation of available transmission control resources more focal and efficient. The integrated control method should be used in the control of urinary schistosomiaisis, which includes the provision of safe water supply, snail control, good personal hygiene and chemotherapy.

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