INTRODUCTION

Urinary schistosomiasis caused by the fluke worm S. haematobium is one of the most common water-borne tropical diseases which pose serious health hazards due to its associated morbidities 1. The World Health Organization 2 reports that over 153 million are infected with this parasitic infection. Nigeria is one of the countries known to be highly endemic for urinary schistosomiasis with estimated 101.28 million persons at risk and 25.83 million 3, 4 people infected. The infection has been associated with water resource development projects such as dams and irrigation schemes, slow-flowing or stagnant water, where the snail intermediate host of the parasite breeds 5. The disease is essentially an infection of rural and agricultural communities where the way of life of people promotes the contamination of inland water with human excreta 6.

In Nigeria pockets of foci of infections have been documented in various parts of the country7-11. Northern part of Nigeria. Only males are subjected to this type of Islamic education hence the reason why no females were involved in this research. To our knowledge, there has not been any study on schistosomiasis among the Almajiris. To this end, this paper tends to elucidate the endemicity of urinary schistosomiasis among the subjects examined indicates the endemicity of the disease in the study area. Public enlightenment and provision of safe drinking water could reduce the high prevalence of urinary schistosomiasis in the community.

ABSTRACT

Background: Urinary schistosomiasis is one of the most common water-borne tropical diseases which poses serious health hazard due to its associated morbidities.

Objectives: To determine the prevalence of urinary schistosomiasis among the study subjects.

Methods: Two hundred and eighteen (218) urine samples were collected from Primary school pupils and 282 samples from Almajiris between March and July 2009. The samples were examined microscopically after centrifugation, and haematuria was tested using reagent strip. The subjects were classified based on the presence or absence of visible haematuria and whether they were positive for Schistosoma haematobium ova (infected) or negative (not infected).

Result: Out of the 282 Almajiris screened, 205(72.7%) were infected; 137 (48.6%) of the sample population were positive for S. Haematobium with haematuria; 68 (24.1%) were positive without haematuria. The subjects within the age group 11-15years had the highest prevalence of 86 (89.6%). Out of the 218 Primary school pupils examined, 24 (11%) were infected. 15 (6.9%) pupils were positive with haematuria, 9 (4.1%) were positive without haematuria. The subjects within the age group 11-15years had the highest prevalence of 15 (14.2%).

Conclusion: The high prevalence of urinary schistosomiasis among the subjects examined indicates the endemicity of the disease in the study area. Public enlightenment and provision of safe drinking water could reduce the high prevalence of urinary schistosomiasis in the community.
schistosomiasis among these risk groups. Also, it reports data on the prevalence of urinary schistosomiasis which broadens the existing epidemiologic data of this parasitic infection in this part of Nigeria and has a direct consequence on planning adequate control program.

MATERIALS AND METHOD

STUDY AREA: The study area is Gwange ward in Maiduguri Metropolis. Gwange is one of the areas that harbor the waterways that pass through Maiduguri Metropolitan Council from Konduga Local Government which is known to be endemic of S. haematobium [12].

Maiduguri the State Capital of Borno State is the largest of the six State capitals in the North East region of Nigeria. It lies on latitude 11°N and longitude 15° east. It occupies an area of 50,778 square Kilometer. Borno State shares border with Republic of Niger to the North, Chad to the North East and Cameroun to the East. Borno State has an estimated population of 4,098,391 people according to 2006 population Census.

STUDY SUBJECT

The study subjects were almajiris and Primary school pupils in Gwange ward of Maiduguri metropolitan. A total of 600 questionnaires were administered and a total of 500 urine samples were collected from the subjects that filled the form. Two hundred and eighty two (282) urine samples from the almajiris and 218 samples from the primary school pupils were analyzed.

The “Almajiris” and Gwange primary school pupils were considered for this research because: (i) Both are easily accessible by the researcher (ii) The peak of the prevalence is to be found amongst these groups due to their proximity with a water body and low level of awareness and (iii) Experience shows that there is general good compliance from children and parents [5,13].

The subjects were given an enlightenment lecture before sampling commenced.

METHODODOLOGY

The questionnaires were filled by the researcher because the Almajiris are not literate and the primary school pupils are not conversant enough to apprehend the questionnaire. The study was carried out between March and July 2009.

The subjects were given sterile urine containers and advised to produce only terminal urine. The collection was done between 10am and 2pm because it is the period that eggs of S. haematobium are more likely to be passed in urine [14,15]. Names of the subjects were omitted and only number codes were used on both the questionnaire and specimen bottles.

The specimens were placed in a cold box with ice packs immediately after collection and taken to UMTH parasitology laboratory and processed within 1-2 hours of collection. In cases where delay became inevitable, ordinary household bleach was added to the urine samples (ratio; 1ml bleach: 50ml urine) to preserve any Schistosome ova present [16]. The urine was transferred to centrifuge tubes bearing in mind the codings and centrifuged.

The urine sedimentation technique [16,18] was used to detect the presence of S. haematobium ova and to determine the intensity of infection in each case. Intensity was reported as light (< 50 ova / 10ml of urine) and heavy (≥ 50 ova/ml of urine). A few drops of saponin solution were added to samples with visible haematuria to enhance clarity of microscopy [16].

Medi-test Combi 9: Macherey Nagel Germany reagent test strip was used to test for microhaematuria and the test result classified according to manufacturer's instructions as negative, 1+, 2+ and 3+ [16,19].

After obtaining approval for the study from the ethics committee, permission for the study was obtained from the “Mallams” (the guardians of the almajiris) and that of the pupils from Education Secretary of Jere Local Government and the Headmasters of the Schools studied; and assent obtained in those <18 years. Information about schistosomiasis and direct contact with water bodies were obtained and recorded in the questionnaire. Subjects who responded to the questionnaires but declined sampling were excluded from the study. Infected subjects were given Praziquantel (20mg/kg) through the Mallams and School Headmaster.

RESULTS

Seventy two percent of the Almajiris responded positively to the question about passing of blood in their urine, while only 2 (0.7%) had knowledge about urinary schistosomiasis. On the other hand, 5% of the primary school pupils responded positively to the question about passing of blood in urine while 13 (5.9%) had knowledge of urinary schistosomiasis. None of the respondents admitted going to the hospital for treatment.

Table 1 depicts status of urinary schistosomiasis among the Almajiris. Out of the 282 screened, 205 (72.6%) were infected. The subjects were classified based on the presence or absence of visible haematuria and whether they were positive for S. haematobium ova (infected) or negative (not infected). Out of the 282 “Almajiris” examined, 137 (48.6%) of the sample population were positive for S. Haematobium with visible haematuria, 68 (24.1%) of the sample were positive without visible haematuria. The subjects within the age group 11-15 years had the highest incidence of 86 (89.6%).

Table 2 depicts status of urinary schistosomiasis among primary school pupils. Out of 218 pupils screened, 24 (11%) were infected with S. haematobium; of which 15 (6.9%) were infected with haematuria and 9 (4.1%) were infected without haematuria. The subjects within the age group 6-10 years had the highest prevalence of 5 (4.7%) with visible haematuria and 9 (1.1%) without
visible haematuria.

On cross tabulation of infection with haematuria with that of urine filtration alone (i.e. infection without haematuria), it was found (table 3) that the proportion of all those examined who were correctly identified by haematuria observation as having urinary schistosomiasis (true positives) was 19%. Similarly, the proportion of the sample that was correctly identified as not being infected on the basis of absence of haematuria (true negatives) was 41.8%. Conversely, 8.8% of the subjects had no S.haematobium ova in their urine even though they had haematuria (false positive); 30.4% of the subjects were positive for S.haematobium ova, although they show no signs of haematuria.

To assess the validity of haematuria in establishing urinary schistosomiasis in any given community, sensitivity and specificity of haematuria were calculated. As observed in the present study, the ability of haematuria to accurately identify all those with disease (sensitivity) was calculated to be 68.3%, while its ability to correctly sort out all those without the disease (specificity) was 57.9%. There was a close association between haematuria and the presence of S.haematobium ova in the urine.

**DISCUSSION**

Several studies of urinary schistosomiasis had focused on school-aged children and adults. The result of this study shows a prevalence rate of urinary schistosomiasis among the Almajiris of 49.4%. This figure is higher than previous studies carried out on school pupils in Ile-Ife (20.5%), Akure (21%) and Goronyo (32.3%).

However, a higher figure of 58.1% was recorded in studies carried out on pre-school children in Abeokuta. These differences may be a result of the level of community dependence on surface water infested with cercaria as the municipal water supply is inadequate. Other reasons include; water contact activities and differences in host immunity. Moreover, the observed high incidence among the “Almajiris” in the present study might be due to the fact that this group lacks parental control which makes them more likely to go out for swimming. Also, they lack adequate knowledge of the disease hence do not look for treatment which consequently makes them reservoirs of the infection. Generally, children around the study area are more likely to frequent the water body due to the harsh Maiduguri weather which persists for most part of the year for their recreational activities and domestic needs.

All the ages studied had infection, meaning that infection with urinary schistosomiasis occurs very early in life through exposure to contaminated water bodies either by guardians and caregivers or the children themselves. In the present study, the peak prevalence of infection was found among age group 11-15 years and is quite in agreement with that of several
other studies in other parts of the country \textsuperscript{15, 21-23} and elsewhere \textsuperscript{24, 25}. This may be because these age groups are less confined and therefore more likely to visit water bodies for recreation than the younger age group. The prevalence and intensity of \textit{S. haematobium} infection and visible haematuria between the two groups studied (Almajiris and school pupils) showed no significant differences. This may be because they share similar socio-cultural background\textsuperscript{17}.

The findings from our study show that the Almajiris harbour infection with urinary schistosomiasis and are therefore a source of transmission in endemic areas. Although currently excluded from mass treatment programs, provision for their inclusion in treatment programs is imperative and should be considered. There is need for Government to come to the aid of the Almajiris who are likely to have other health related problems which could manifest later in life and impede their contribution to the economic development of the country.

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