WEST AFRICAN JOURNAL OF MEDICINE

ORIGINAL ARTICLE

Studies on the Prevalence of Urinary Schistosomiasis in Ogun State, South-Western Nigeria

Etude Sur La Prevalence De La Schistosomiase Urinaire Dans L'etat De Ogun, Sud-Ouest Nigeria

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ABSTRACT

BACKGROUND: **The assessment of the extent and distribution of *Schistosoma* infection in every region in Nigeria is important and required for formulating intervention strategies suitable for each endemic area.**

OBJECTIVE: **To assess the prevalence of urinary schistosomiasis in Ogun State, South-West Nigeria.**

METHODS: **Urine samples of pupils were examined for schistosoma eggs by sedimentation technique among selected primary school children. Pretested and structured questionnaires were also administered for KAP studies.**

RESULTS: **The overall prevalence of 32.2% was observed for schistosomiasis in 276 pupils. Peak prevalence of urinary schistosomiasis infection (36.2%) was found in 8–10 years age group. Thirty-seven percent reported passing blood in urine, about 50% of these informed their parents but 53.1% of the parents did nothing. Contact with stream water played a significant role in the transmission of urinary schistosomiasis as 80.9% of those infected used the stream water for domestic and recreational purposes. There was no significant difference (χ^2 = 0.0489, P>0.05) between infection status among males and females.**

CONCLUSION: **There is need for control measures in this area in order to curb the high prevalence of schistosomiasis. WAJM 2011; 30(1): 62–65.**

Keywords: **Schistosomiasis, *Schistosoma haematobium*, haematuria, KAP, Ogun State, Nigeria.**

RÉSUMÉ

CONTEXTE: *L'évaluation de la répartition et la distribution de l'infection à Schistosoma dans chaque région au Nigeria est important et nécessaire pour reformuler des stratégies d'intervention convenable pour chaque zone endémique.*

OBJECTIFS: *Evaluer la prévalence de la schistosomiase urinaire dans l'état d'Ogun au Sud Ouest du Nigeria.*

METHODES: *Des échantillons d'urine ont été prélevés pour rechercher les œufs de Schistosome par la technique de sédimentation parmi les élèves du primaire. Un pré-test et un questionnaire ont été administrés pour l'étude KAP.*

RESULTATS: *Une prévalence globale de 32,2% a été observée pour l'infection à schistosoma chez 276 élèves. Le pic de prévalence de l'infection urinaire à schistosoma (36,2%) a été retrouvé dans la tranche d'âge de 8-10 ans. Trente sept pour cent des cas ont présenté une hématurie, environ 50% d'entre eux ont informé leurs parents, mais 53,1% de ces derniers n'ont rien fait. La contamination par les cours d'eau souillée a joué un rôle significatif dans la transmission de la schistosomiase urinaire, en effet, 80,9% des infectées ont utilisé les eaux souillées pour des motifs domestique et de loisirs. Sur le statut infectieux, il n'y avait aucune différence significative.(χ^2 = 0.0489, P>0.05) entre les hommes et les femmes.*

CONCLUSION: *il est nécessaire d'effectuer des mesures de contrôle dans cette zone, pour juguler la forte prévalence de la schistosomiase.* ***WAJM 2011; 30(1): 62–65.***

Mots-cles: *Schistosomiase, Schistosoma Haematobium, Hematurie, Kap, Etat D'ogun, Nigeria.*

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Abbreviations: KAP, Knowledge, altitude, and practice; **LGA,** Local government area.

INTRODUCTION

Schistosomiasis, caused by parasitic trematode worms (schistosomes) is one of the ten tropical diseases especially targeted for control by the special Programme for Research and Training in Tropical Diseases of the United Nations Development Programme, the World Bank and the World Health Organisation.[1] Those which infest man include *Schistosoma haematobium, S. mansoni, S. intercalatum,* and *S. japonicum.*[2]

Schistosomiasis currently affects ≈207 million people in tropical countries, 20 million of whom have severe illness[3]. Both intestinal schistosomiasis caused by *S.mansoni* and urinary schistosomiasis caused by *S.haematobium* are endemic in Nigeria particularly in rural areas[4]. Urinary shistosomiasis is however more widely distributed. It is endemic in 54 countries mainly in Africa and the Eastern Mediterranean.[5]

Urinary schistosomiasis is transmitted by the Planorbid snail, *Bulinus* species of which there are two sub genera, *B. bulinus* and *B. physopis.*[6,7] By contact with water contaminated with urine containing viable eggs of *S. haematobium,* man becomes infected with urinary schistosomiasis.[4]

This study investigated and reassessed the infection status of urinary schistosomiasis in the study population.

SUBJECTS, MATERIALS, AND METHODS

Study Area and Population

The study was carried out in Ijebu East Local Government Area (LGA) which lies between longitude $3^0 87'$E and $4^0 30'$E and latitude $6^0 20'$N and 7^0N of Ogun State, South-Western Nigeria. Ijebu East is bounded by Ogun Waterside LGA in the East, Oyo State in the North, Ijebu-Ode and Ijebu North Local Governments in the West and Epe LGA (Lagos State) in the South. The area is largely inhabited by Yoruba-speaking people, of which the Ijebus comprise about 98%, with the Itsekiris and Urhobos making up the remaining 2%. Farming, timber logging, and trading are the main occupation of the people.

The study population was randomly drawn from five primary schools in Lumafon, Lopo-korede, Uro, Sasa-Olumogo and Oguru Communities. A total of 276 pupils participated in the study by responding to a questionnaire and providing the required urine samples.

Ethical Consideration /Approval

Full approval was given by the University of Ibadan/University College Hospital Institutional Ethical Review Committee before the commencement of the study. In addition approval was obtained from the State Universal Basic Education Board (SUBEB) of Ogun State to carry out the research work and to collect urine samples. Consent was obtained from the parents through the head teachers of each school.

Questionnaire Administration

Pretested and structured questionnaire to investigate Knowledge, Attitude and Practice (KAP) in the management of schistosomiasis was administered to the pupils. The questionnaire included sections on demographic information, water contact patterns, and knowledge about schistosomiasis. The questionnaires were administered to the pupils by their class teachers in English and Yoruba languages and in a few cases the questionnaire was interpreted to Itsekiri and Urhobo languages. The teachers called each pupil into an empty classroom for the interview. The interviewed pupils were then placed in another class to prevent communication with those yet to be interviewed.

Sample Collection/Laboratory Analysis

The participants were each given a dark plastic container, with codes corresponding to the number on the questionnaire, to provide the terminal urine which was collected between the hours of 1000 and 1300. The urine samples were transported to the laboratory for processing and microscopic examination. Urine samples were examined for infestation by sedimentation technique.

Statistical Analysis

Data obtained were analyzed using SPSS software for windows version 12.0 statistical package. The results were tested with χ^2 to determine variability in the distribution of categorical variables for each study outcome, with an α – level of $P<0.05$ indicating statistical significance.

RESULTS

A total of 276 pupils were examined in five schools, located in Ijebu East Local Government Area. Of the 276 pupils examined, 140(50.7%) were males while 136(49.3%) were females. In all the 276 pupils examined, 89(32.2%) were infected with *S. haematobium.*, 46(32.9%) males and 43(31.6%) females.

Half (50%) of the total population examined were between 8–10 years age group with infection prevalence of 36.2% (Table 1). This age group made up 56.2% of the infected population while pupils within 11–13years age group made up 33.7% of the infected population.

Prevalence of infection in individual schools ranged from "no infection" in Uro and Oguru to 61.7% prevalence in Lumafon (Table 2).

Table 3 shows that low to moderate and heavy intensity of infestation occurred in the study population, with the males (15%) having more heavy infection than females (10.3%).

Table 1: Prevalence of *S. haematobium* infestation in relation to age of pupils

Age Group	Number (%)	
(years)	Examined	Infected
5 – 7	27 (9.8)	6 (22.2)
8 – 10	138 (50)	50 (36.2)
11 – 13	97 (35.1)	30 (30.9)
14 – 16	14 (5.1)	3 (21.4)
Total	**276 (100)**	**89 (32.2)**

Table 3: Prevalence of *S. haematobium* Infestations in Primary Schools in the Study Area

	Number (%)
School	Infected
St. John Primary School, Lumafon	37(61.7)
St. Paul Anglican Primary School, Oguru	0(0.0)
St. Paul Primary School, Uro	0(0.0)
St. John Primary School, Lopo-Korede	29(48.3)
St. Paul Primary School, Sasa-Olumogo	23(37.7)
Total	**89(32.2)**

Table 3: Intensity of Urinary Schistosomiasis Infection in Relation to Age and Sex in the Study Population

Age (years)	Male				Female			
	No.	Light*	Moderate†	Heavy‡	No.	Light	Moderate	Heavy
5 – 7	9	0	1	0	18	1	2	2
8 – 10	76	3	14	12	62	5	8	8
11 – 13	46	2	4	9	51	5	6	4
14 – 16	9	0	1	0	5	0	2	0
Total	**140**	**5**	**20**	**21**	**136**	**11**	**18**	**14**

Intensit: *Light, 1–9 eggs/10ml; †Moderate, 10–49 eggs/10ml and ‡Heavy, >50 eggs/10ml.

Table 4: Distribution of Water Sources in Relation to *S. Haematobium* Infection

Water Source	Number (%)		
	User	Schistosomiasis Status in Pupils	
		Positive (%)	Negative (%)
Stream	138 (50.0)	72 (52.2)	66 (47.8)
Well	96 (34.8)	0 (0.0)	96 (100.0)
River	31 (11.2)	17 (54.8)	14 (45.2)
Spring	10 (4.0)	0 (0.0)	10 (100.0)
Total	**276 (100.0)**	**89 (32.2)**	**187 (67.9)**

Source of water for domestic use and other activities as reported by the respondents, ranged from stream, river and well to spring. Half (50%) of the population sampled used the stream for most of their activities (Table 4). The percentage of infected pupils using the stream made up 26% of the total population sampled and 80.9% of the infested population.

From the pupils' responses, 96% did not know what schistosomiasis was while the remaining 4% gave no response to the question, and 79.3% did not know what caused blood in urine. Only 1.4% of the study population attributed blood in urine to bathing in the stream. Although majority (89.9%) of the pupils thought or knew that it was not normal to pass blood in urine when 8.0% thought it was normal and 2.2% gave no response, 13.8% did not think it could be associated with an infection while 2.2% were undecided (Table 5).

The pupils were asked to recall the history of haematuria or if the situation was present during the time of administering the questionnaire, 103(37.3%) said they had/could recall seeing blood in their urine. Of those who had or had had haematuria in the past, 49(47.6%) did inform their parents but for majority 26(53.1%) of them, their parents did nothing about the situation while only 9(18.4%) sought clinical intervention for their children (Table 4).

DISCUSSION

The results of this study show that *S. haematobium* is still actively transmitted within Ijebu-East L.G.A and in south-west Nigeria. The overall prevalence of 32.2% observed in this study is high enough to attract the attention of the state health authorities especially in the area of provision of safe water. This is because the inhabitants of the area depend mainly on streams, the transmission site of the parasite, for domestic, agricultural and recreational use. The peak prevalence of 36.2% was observed in 8–10 years age group. Other studies reported peak prevalence in different age groups, 16–20 years,[6] 11–20 years,[7] 6–8 years[8] and 12–13 years.[9] Anosike *et. al* [10] while conducting a study on Ezza farmers inhabiting the southwestern border of Ebonyi State observed a gradual increase in the disease prevalence as the subjects' age increased.

No significant difference was observed in infection rate between males and females. This is in agreement with studies by Agbolade and Odaibo.[11] In contrast, Okoli and Odaibo[7] observed that boys have a significantly higher infection rate (24.1%) than girls (8.5%) and higher intensity of infection was reported in males (39.0 eggs/10ml urine) than in females (22.1 eggs/10ml urine). Olofintoye and Odaibo[12] reported a significant difference (χ^2=15.08 P<0.05) in infection between males (36.2%) and females (29.1%). The intensity study showed that light (1–9 eggs/10ml urine) to heavy (= 50 eggs/10ml urine) infection occurred in infected children with 39.3% of the infected population excreting ≥50 eggs/10ml urine.

It can be observed that urinary schistosomiasis infection, although decreased (61.7%) in prevalence when compared with 80% earlier reported by Idowu,[13] is still actively transmitted in Lumafon. The prevalence observed for Sasa-Olumogo and Lopo-Korede goes to confirm the report based on reported "blood in urine" by Ekpo *et. al.,*[14] that these areas are in the high risk infection area. However no infection was observed in the schools sampled in Uro and Oguru which Ekpo *et. al.,*[14] classified as high and low risk areas respectively.

The knowledge of urinary schistosomiasis and the transmission method is necessary to plan effective control measures against the infection. Presence of blood in urine is one of the diagnostic markers used for detecting the infection in an individual, therefore assessing the pupils' knowledge about urinary schistosomiasis by relating it to causes of blood in urine is a useful means. The result showed that, the knowledge of the pupils about schistosomiasis was minimal in that only 1.4% of the entire population of 276 pupils could attribute bathing in stream water with blood in urine and majority do not know what schistosomiasis is.

Table 5: Knowledge of urinary schistosomiasis among pupils and parent's responses to their infection status

Response	Frequency (%)
What causes blood in urine?	
Bad or dirty water	14 (5.1)
Sickness	37 (13.40)
Bathing in the Stream	4 (1.4)
Insects	2 (0.7)
Don't know	219 (79.3)
Total	**276 (100.0)**
Is blood in urine caused by an infection?	
Yes	232 (84.1)
No	38 (13.8)
No response	6 (2.2)
Total	**276 (100.0)**
What did your parent do about blood in your urine?	
Clinical intervention	9 (18.4)
Herbal Medicine	8 (16.3)
Drugs	6 (12.2)
Nothing	26 (53.1)
Total	**49 (100.0)**

The study assessed parents' response to excreting blood with urine in the pupils; although majority of the pupils informed their parents of passing blood with urine only 18.4% of the parents' population sought clinical intervention. This low response rate in parents could be attributed to the low educational status, since most of them were farmers.

Streams, harbouring infested intermediate snail host of the parasite accounted for the major available source of water for most of the activities the people engage in, with over 80% of the infected population making use of water from this source as seen on Table 7. The prevalence of infection can be drastically reduced by the provision of safe, pipe borne water for the inhabitants of this area.

This study has established that urinary schistosomiasis is still actively transmitted in the study area and the need for control measures to curb its high prevalence.

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