Original Article

Prevalence of Urinary Schistosomiasis in School-aged Children in Langai, Plateau State: Pre- and Post-intervention.

Banwat, ME., Ogbonna C, Daboer JC, Chingle MP, Envuladu EA, Audu, S, Lar, LA.
Department of Community Medicine, Jos University Teaching Hospital., PMB 2076, Jos.

ABSTRACT

BACKGROUND: Schistosomiasis poses a public health challenges, but for several reasons it is not considered a priority in national and local health policies and programmes. The objective of this study was to determine the effect of health education and drug treatment on the prevalence of Urinary Schistosomiasis among school-aged children in Langai community of Plateau state.

METHODS: Two hundred and eighteen children (218) subjects who were selected by multi-staged sampling methods were administered semi-structured questionnaires and their urine samples were assayed for *S. haematobium* ova using the sedimentation method, before and after drug treatment with Praziquantel tablets.

RESULTS: Pre-intervention, fourteen (14) respondents had urinary Schistosomiasis, giving a prevalence of 6.4% with males (64.3%) having the higher prevalence both pre- and post-intervention. Six weeks after intervention, prevalence had reduced to 0.9%, giving a cure rate of about 92%. Of the 22 respondents (10.1%) who had ever noticed 'blood in their urine', only 6 (27.3%) had Schistosoma ova present in their urine samples at the time of the study.

CONCLUSION: It was concluded that drug treatment with Praziquantel, especially when combined with Health Education was effective in reducing the prevalence of Urinary Schistosomiasis among school-aged children in Langai Community of Plateau State.

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KEY WORDS: Prevalence, Urinary Schistosomiasis, Health Education, Treatment.

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INTRODUCTION

Schistosomiasis is a parasitic disease caused by several species of flatworms of the genus *Schistosoma*. Although it has a low mortality rate, Schistosomiasis is often a chronic illness that can cause liver, bladder, uro-genital tract and intestinal damage and can be very debilitating.[1,2] Among tropical diseases, it is second only to Malaria in human impact and it is the third most prevalent parasitic disease in the world.[2,3] Recent WHO reports estimate that 779 million people in 76 tropical and subtropical countries (more than 10% of the world's population) are at risk of Schistosomiasis and approximately 80% of the people infected with Schistosomiasis live in Sub-Saharan Africa, where the annual mortality is estimated to be 280,000. [1,3,4] Persons at risk include those who live in or travel to areas where Schistosomiasis occurs and who come into contact with fresh water that contains the appropriate type of snail intermediate host.

Children and adolescents are infected most often and are infected most heavily. [3] Infections peak in individuals aged 10-19 years,[3] these are usually school-aged children who are at risk because of their tendency to indulge in group swimming or fishing in snail infested water bodies or follow their parents to fish or collect edible snails for food.

This paper examines the effect of chemotherapy combined with health education on prevalence of Schistosomiasis among school children in Langai town of Plateau State.

METHODS

Langai is a rural community in Mangu Local Government Area of Plateau State, Central Nigeria with an estimated population of 2,920 people (an estimated 10% of whom are postulated to be of school age) who are mainly farmers and traders.[5] River Langai is a major source of water for both human and animal activities. The study was a community based interventional study carried out between 1st May and 28th June 2009.

Two hundred and eighteen (218) children aged 5-19 years old living in Langai at the time of the study were sampled for study using multi-staged sampling method: in stage one, Mangu local Government area was sampled from the 17 LGAs in Plateau State using Simple Random Sampling by balloting. *In stage two, Langai ward was selected from a sampling frame of the 20 wards in Mangu LGA, using Simple Random sampling by balloting. In stage two, from a sampling frame comprised of the 4 villages in Langai ward, Langai village was selected by Simple Random sampling by balloting. In stage four, using a systematic sampling technique, a sampling interval of 1.4 (approximated to 1) was gotten by dividing the calculated minimum sample size of 200 by the postulated number of children aged 5-19 in the community (292).*

A structured interviewer administered questionnaire was administered door-to-door (*to include non-school going*

Correspondence to: Dr Mathilda E Banwat, Department of Community Medicine; Jos University Teaching Hospital, PMB 2076, Jos. 08036133983
mathildabanwat@yahoo.com

school aged children and since pre-intervention schools were on holidays) to the sampled population, collecting subject's biodata and other data on their Knowledge, Attitude and Practices which affect their predisposal to contracting Urinary Schistosomiasis. *An adult care giver gave information for children too young to do so by themselves*. Each subject was then given a new universal container to collect terminal urine samples between 10am and 1pm after the correct procedure for urine sample collection was explained to subjects/caregivers. Each urine sample was examined microscopically for *Schistosoma haematobium* eggs using the sedimentation technique.

Health education was then given to the school-aged children during three school assembly days. *Members of the community and school teachers were given health education on three consecutive market days in the market square / assembly to enable them re-enforce the health education given to the children both at home and in school.* The content of the health education included what Schistosomiasis is, the causative agent, its mode of transmission, activities that put them at risk of contracting the disease, clinical features of the disease, misconceptions about the disease , treatment for the disease and where to access the treatment.

Health education was followed by mass chemotherapy *with Praziquantel at a dose of 40mg/kg body weight* to all children aged between 5 and 19years and the drugs were ingested under direct observation of the research team, administered door to door, with a mop-up conducted in the primary and secondary schools to ensure adequate drug coverage. *Mass chemotherapy was done since the prevalence of the disease was above the ≥5% cut-off prevalence used by the Plateau State Schistosomiasis Control Programme for mass chemotherapy among school-aged children and door to door administration is the control programme's usual way of drug distribution to enable the recording of clients treated based on household PHC numbers.*

Six weeks post-intervention, the same questionnaires were administered to same subjects as pre-intervention. *Their urine samples were also collected and analyzed for S.haematobium eggs using sedimentation method, as done pre-intervention.*

Ethical clearance was obtained from Jos University Teaching Hospital (JUTH) Ethical Committee before the study commenced. Written permission was sought and obtained from the Plateau State Commissioner for Health, Mangu LGA Chairman and the Village Head of the study community. Written informed consent was also sought for and obtained from the parents/ guardians of each child before enrollment into the study.
All data generated both pre- and post intervention were collated and analyzed using Epi info statistical software version 3.4.2. The Chi-square test was used to determine any association between certain socio-demographic variables an treatment outcomes in the children. A confidence interval of 95% was used in this study and a P-value of ≤ 0.05 was considered statistically significant.

RESULTS

One hundred and fourteen (52.3%) of the respondents were within the age group 10 14 years, which is also the median class; although the respondents' ages ranged between 6 and 19 years, with a mean age of 13.12 ± 3.4years (Table I). There were more males (51.4%) than females (48.6%) in the studied population.

The prevalence of urinary Schistosomiasis as shown by the presence of Schistosoma ova in the urine of the respondents, was 6.4% pre-intervention while only 0.9% were found to be infected post-intervention (Table II). This difference was statistically significant, P = 0.0335.
The prevalence of urinary Schistosomiasis both pre-intervention and post-intervention was higher in males (64.3%) as compared to female study subjects (45.7%). This difference was however not statistically significant with P = 0.55(Table III).

Only 22 (10.1%) of respondents had ever noticed 'blood in their urine', most of which occurred the year preceding the research. Of these, only 6 (27.3%) had Schistosoma ova present in their urine samples at the time of the study (Table IV). A statistically significant relationship was found between the history of haematuria and positive urine test for Schistosoma ova, P <0.0001

TABLE I: Age/ Sex distribution of study subjects

Age groups	Female Frequency (%)		Male Frequency (%)		Total
5-9 years	28	(44.4)	35	(55.6)	63
10-14 years	37	(39.8)	56	(60.2)	93
15-19 years	32	(50.8)	30	(49.2)	62
Total	97		121		218

TABLE II: Prevalence of Schistosomiasis pre- and post-intervention

S.haematobium ova	Pre-Intervention Freq	(%)	Post-intervention Freq	(%)
Present	14	6.4	1	0.9
Absent	204	93.6	217	99.13
TOTAL	**218**		**218**	

Fishers exact = 2.73; d=1, P = 0.0335

TABLE III: Relationship between sex and Schistosoma ova

	S.haematobium (N=218) Females Freq	(%)	Males Freq	(%)
Ova absent	92	(94.8)	112	(92.6)
Ova present	5	(5.2)	9	(7.4)
Total	97		121	

χ^2 = 0.35; d = 1; P= 0.55

TABLE IV: History of haematuria by S.haematobium ova

History of haematuria	*S.haematobium ova*.(n = 22) Present Freq	%	Absent Freq	%	Total
No	8	4.1	188	95.9	196
Yes	6	37.3	16	72.7	22
Total	14	6.4	204	93.6	218

χ^2 = 34.84 ; df = 1 ; P < 0.0001

DISCUSSION

The prevalence of urinary Schistosomiasis among the study population pre-intervention was 6.4% with 14 out of the 218 respondents having Schistosoma ova present in their urine. This low figure contrasts findings from other rural studies within the state[6] (21 68%), the country[7] (20 81%) and the sub-region.[8] This may be due to the fact that being a seasonal disease, urinary Schistosomiasis has a low prevalence during the rainy season, due to the availability of rain water and water in their domestic wells, children have reduced contact with cerciaria infested water bodies like rivers and dams. It may also be related to the effect of mass distribution of the Praziquantel, Albendazole and Ivermectin by the Schistosomiasis and Onchocerciasis Control Unit of the Plateau State Epidemiological Unit in Mangu, a year before the study.

Six weeks post-intervention, the prevalence dropped to 0.9%. The high cure rate of 13 out of 14 (92.9%) achieved was similar to, though slightly higher than findings of 80 90% in other studies.[9,10] It shows how effective the drug used (Praziquantel) is in the control of Schistosomiasis.[11,12,13] For this study, the drugs were given free and ingested under direct observation of the research team. This ensured compliance and helped achieve such a high cure rate. There was no statistically significant difference in cure rate when compared against age or sex of respondents. This agrees with findings from other studies which show similar cure rates irrespective of both variables.[2,14,15]

The prevalence of the disease was higher in males as compared to females; with 9 of the 14 positives (64.3%) being male as compared to 5 females (35.7%); this difference was however not statistically significant with P = 0.55. This is similar to findings in other studies which attribute this sex difference to the more adventure seeking behavior of males as compared to their female peers.[16,17] A study among children in Morocco reported a prevalence of 18% for males as compared to 31% for their male counterparts.[14] A study in Northern Nigeria showed a higher prevalence in male school-aged children.[14] Some other studies, especially those in the southern part of the country, contrasted this finding by reporting a higher prevalence in females due to their increased use of the water bodies to carry our domestic and commercial activities like snail farming / catching and buying of sea creatures (crabs, lobster, fish) for sale.[18,19]

There was a statistically significant association between gross haematuria and disease prevalence as well as between microscopic haematuria and disease. Both show that the disease has run a chronic course in the infected individual.[4,20,21] However the few individuals who had microscopic haematuria with no detected Schistosoma ova either did not collect terminal urine (which usually contains the egg) or are suffering from other causes of haematuria like trauma to the urethra, or vulva/vagina. Most studies see this haematuria as a basis for treating particularly children in Schistosomiasis endemic areas for the disease using mass chemotherapy.[21,22]

CONCLUSION

Health education and treatment with Praziquantel tablets proved effective in reducing the prevalence of Urinary Schistosomiasis among school aged children in Langai village sevenfold; from 6.4% to 0.9%. Thus reducing the transmission rate of the disease and contributing to its control in the locality. *It is therefore recommended that drug treatment be periodically done in endemic communities and should be combined with health education, to both the children and responsible adults to prevent re-infection and risks of complications*.

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