Research Journal of Biological Sciences 2 (1): 1-4, 2007

Socio-Cultural Practices Promoting the Transmission of Urinary Schistosomiasis among School Aged Pupils in a South Western Village in Nigeria

M.O. Oniya
Department of Biology, Federal University of Technology, P.M.B 704, Akure, Nigeria

Abstract: Studies were carried out on the epidemiology of urinary schistosomiasis among school-aged pupils in a Nigerian Village endemic for the disease. Prevalence of infection as at the time of survey was 59% and results obtained via questionnaire administration on socio-cultural practices promoting transmission revealed that there was a dearth of information about the aetiology and transmission of the disease, which still remained the major public health problem in the community. Increased community based education by qualified personnel and committed control measures against parasite and snail host over a long term basis, were identified form this study as probable methods of eradicating the scourge.

Key words: Socio-cultural, questionnaire, urinalysis and transmission

INTRODUCTION

Schistosomiasis, also known as bilharziasis, is a parasitic disease that leads to ill health. It is a major health risk in the rural areas of developing countries where it continues to rank high. Schistosomiasis has been recognized since the time of the Egyptian pharaohs. Theodor Bilharz, a young German pathologist, from whom the disease took its original name, Bilharziasis, eventually discovered the worms responsible for the disease in 1851. The disease is indicated either by the presence of blood in the urine or, in the case of intestinal schistosomiasis, by initially atypical symptoms which can lead to serious complications involving the liver and spleen (WHO, 2004). The disease affects some 200 to 300 million people across Africa, South America, the Caribbean, the Middle East, China and Southeast Asia. The schistosomes or blood flukes are parasites of the blood stream of warm-blooded vertebrates and they are the only digenetic trematodes to occupy such habitat (Ukoli, 1991). Generally, their life cycle revolves round two hosts: a definitive host (vertebrate) and an intermediate host (mollusc). It is a water-borne disease, with more than 600 million people in 74 countries at risk (Editorial, Acta Tropica, 2000). Unfortunately, schistosomiasis is a disease that primarily results from lack of education and public health facilities, appalling sanitary conditions and poverty found in many underdeveloped nations like Africa. Butterworth (1990) reported that increasing population density in Africa has put heavy pressure on effective land usage, leading to a progressively widespread development of large- and small-scale irrigation schemes that increase the potential for transmission. So long as such conditions persist, schistosomiasis will continue to plague humanity. Human exposure to freshwater in underdeveloped tropical and sub-tropical areas suffering from these problems is the major determinant to infection. In Africa, endemicity may be linked to behaviour and the socio-economic status of the people living in this part of the world (Ukoli, 1987, 1991 and 1992). The factors that promote transmission include the presence of susceptible snail intermediate hosts in stagnant or freshwater bodies visited by people living around such for domestic, occupational, or recreational activities. In Nigeria, two species of the causative organisms have been reported. These are *S. mansoni* and *S. haematobium*, causing intestinal and urinary schistosomiasis respectively however, the latter is more widely spread (Ejezie *et al*., 1989). The present study was carried out to determine the socio-cultural factors promoting disease transmission in an endemic village in southwestern Nigeria.

MATERIALS AND METHODS

Study area: The study was carried out at Ipogun (7°19`N; 5°05`E), a rural village in Ifedore Local Government Area of Ondo state with an estimated population of about 6,000. The village is about 14 kilometres away from Akure, the state capital. Although the village enjoyed epileptic supply of electricity, it still remained very rural with bad roads. In all, the village had 6 schools; 5 primaries and I secondary school. The major occupation of the villagers was farming. Despite the provision of boreholes, though

inadequate, the villagers still visit the only stream (Aponmu) in the village for their domestic activities. These included bathing, washing, processing of farm produce and a source of recreation for the younger ones.

Study design: A total of 350 school pupils were recruited for the study with the approval and assistance of the Ondo state ministry of health: 162 (69 males; 93 females) from St. Jude's Pry. school; 98 (54 males; 44 females) from Muslim Pry. school and 90 (58 males; 32 females) from Ayo grammar school. The number recruited from the secondary school was few because majority of the students failed to cooperate due to peer influence. The pupils were recruited randomly from the assembly ground using the class registers. Their names, ages, classes and sex were written down to facilitate easy follow up. The pupils were screened for schistosomiasis to determine the prevalence of infection and thereafter, questionnaires were administered on one hundred and fifty of them.

Urinalysis: Each pupil was given a transparent 20 mL plastic bottle to urinate in. The bottles were corked tight, labelled and taken to the laboratory for analysis. Samples were collected between 09:00 and 13:00 h. Laboratory analysis was done using the centrifugation method. Ten milliliter of urine was centrifuged at 1,500 rpm for 3 min and the residue examined under the X10 objective of the microscope for the presence of terminal spined ova of *S. haematobium*. Eggs of *S. haematobium* were counted under light microscope at low magnification. Results were expressed as the number of *S. haematobium* eggs 10 mL^{-1} urine. Cases of haematuria observed were also reported.

Questionnaire administration: Open end questionnaires were administered to 150 pupils to identify socio-cultural factors promoting disease transmission. Each pupil was interviewed and the answers written against the questions asked because of the low level of literacy. Questions asked ranged from parent's occupation, reasons for visiting water bodies, to knowledge about the disease and its cause(s) and probable control measures etc. The questionnaire was pre-tested and standardized and administered in Yoruba Language the native tongue of the respondents.

RESULTS

Two hundred and five of the pupils examined were positive for *S. haematobium* (Table 1) with an overall macrohaematuria in 115(55%), given a prevalence rate of 59%.

Open end questionnaires were administered to 150 school pupils (male 92(61%); female 39(39%)) selected at random in order to determine socio-cultural factors promoting disease transmission. The respondents were interviewed separately to ensure confidentiality and the questions were asked in the local dialect before the administrator wrote down the answers. Majority of the pupils 123(82%) claimed to have been infected at one time or the other (Fig. 1). Seventy seven male and 53 female pupils, totalling 130 (about 87%) claimed to swim in the stream which they visited at various times of the day (Table 2). Other activities, which led them to the stream include washing, water fetching and fishing. The pupils' answers to the knowledge about the types of drugs used to cure infection revealed that 57 of them had used praziquantel (which they popularly referred to as

Table 1: Prevalence of *S. haematobium* infection among school pupils in ipogun

School	Number examined	Number infected (%)	Number (%) with haematuria	Geometric mean egg 10 mL^{-1} urine
St. Jude Pry. Sch.	162	66(41%)	33(50%)	28.23
Muslim Pry. Sch.	98	80(82%)	50(63%)	26.51
Ayo Grammar Sch.	90	59(66%)	32(54%)	16.51
Total	350	205(59%)	115(55%)	23.12

Table 2: Periods of daily trips and number of respondents that visit the stream

Time of the day	Female	Male	Total
7-9 am	5	5	10
10am-12 noon	9	7	16
1-3 pm	31	63	94
4-6 pm	13	14	27
None	0	3	3
Total	58	92	150

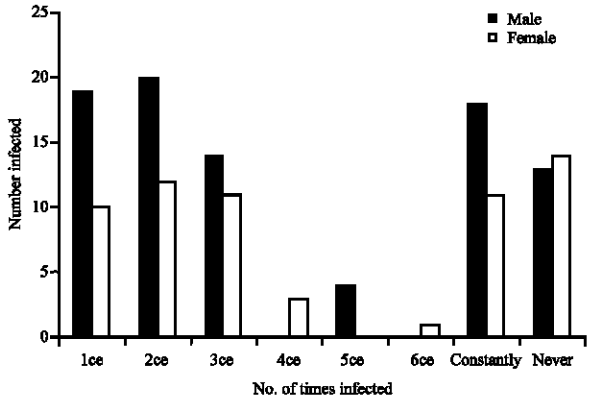

Fig. 1: Frequency of *S. haematobium* infection among the respondents

Table 3: Response by pupils to the types of drugs used to cure schistosomiasis infection in the village

Drug used	Female	Male	Total
Praziquantel	17	40	57
Blood tonic	0	1	1
Unknown drug	7	12	19
Holy water	1	0	1
Injection	0	1	1
Herb	1	0	1
None	19	24	43
No cause for therapy	13	14	27
Total	58	92	150

government drug) before the study (Table 3), suggesting an initial treatment regime before the survey started. This was confirmed from the ministry of health workers that the villagers were actually treated some months before the survey commenced in October 2002. However the treatment was not school, but village based, accounting for 43 pupils who claimed not to have taken any drug. 86% (129) of the pupils said they would stay away from the stream if pipe borne water were made available leaving only 21, resolute on not abstaining. Majority of the pupils, 57(38%) had no knowledge about the control of the disease. 41(27%) attributed disease control to abstaining from the stream while only 21(14%) believed that control can be achieved through chemotherapy, leaving only 21% (31 pupils) of the respondents who attributed not swimming in the stream as a viable control measure. On the knowledge of the cause of the disease, 96(64%) pupils claimed that water snails are the cause of the disease. Twenty eight percent of the pupils (42) said they had no idea of the cause of the disease while 3% (5 pupils) and 5% (7 pupils), respectively claimed that ordinary (land) snails and swimming in the stream are the causes of the disease.

DISCUSSION

Schistosomiasis transmission is very rampant in the village as majority of the interviewed pupils (82%) claimed to have been infected at least once. The village had always been reported as endemic in the state and the urinalysis result confirmed this. The administration of the questionnaire was very useful in detecting socio-cultural practices promoting disease transmission and its use in schistosomiasis epidemiology already highlighted (Stothard *et al*., 2002; Langeler *et al*., 2002), is herein upheld as a simple and reliable tool. Very many of the pupils had no knowledge about the control of the disease and none actually knew that the blood fluke causes the disease. The farthest they got was to associate aetiology with the intermediate host, water snails, of which they weren't too sure. The reason for the latter was probably because the health workers revealed that they had organised enlightenment programmes in the past, pointing to the danger of contracting disease by swimming in the snail infested stream. None of the pupils could associate the role of infected patients to the epidemiology of the disease. Provision was made for hand-operated boreholes, still the pupils preferred to visit the stream. This study revealed that majority of the children visited the stream between 1 pm and 3 pm in the afternoon. This coincides with the peak period of cercariae shedding from snails under the bright light of the afternoon sun, the closing time in schools and thus transmission is very well synchronised. Majority of the pupils (87%) claimed to swim in the stream, while other non-swimming activities that led them to the stream included washing, water fetching etc. From this, it seems that water contact has actually eaten deep into the culture of the pupils and thus efforts to minimize the scourge should not only be chemotherapy dependent, as the high degree of water contact predisposes them to constant infection as shown in the result. Although a higher majority of the pupils responded to have used praziquantel to cure infection, a reasonable lot (43) claimed not to have used any drug. Other therapeutics used by the other respondents revealed the degree of ignorance among the pupils in the village concerning treatment.

Community based health talk programmes (Aryeetey *et al*., 1999) by qualified personnel on routine basis, may go a long way to check ignorance and even encourage the people to sink wells instead of visiting water bodies. Communal health talks on regular basis, every quarter of the year, should help in educating the whole community about the disease's aetiology, pathology and prevention and control measures. The stream remained the only significant source of water except during the rainy season. Nonetheless, the school pupils were a bit responsive to the health talk given after completing the survey as many promised to stop swimming or bathing at the stream. On the whole, the impact of the health talk was positive, at least, they now know how the disease is transmitted, which also includes their role. Conversely, a complete abstinence from the stream may not be realistic until suitable alternatives are proffered. The most suitable alternative being provision of pipe borne water, or automated boreholes, which still remains a wishful thought, hence control measures for now should be based on chemotherapy, molluscicide and raising the level of the consciousness of the pupils.

Raising Schisto-Control peer clubs in secondary schools in endemic areas should also play a significant role in increasing awareness between peers and a

further encouragement to screening/chemotherapeutic programmes. The goals of such clubs should include peer education on disease transmission and the danger in abstaining from control studies, as well as being a community vanguard on disease control. Such groups should however enjoy some level of sponsorship. Control measures stated above are very desirable, though all require huge political and financial commitment. Countries where significant progresses have been made on schistosomiasis control had a committed government policy (Editorial, Acta Tropica, 2000) and it might not be said for Nigeria. Hitherto, chemotherapy is the only religious control option mounted by the Ondo state government. This alone cannot solve the problem (Sturrock, 2001) though; isolated cases of molluscicide have been carried out but not as recurrent as the chemotherapeutic approach.

The possibility of modifying behaviour by providing alternative source of water is another option of achieving control. However two things might negate this move. The first being the financial provision for such gigantic scheme as schistosomiasis control without adequate funds is a joke. And the second, even if pipe borne water were provided, though majority (86%) of the children claimed they would stay away from the stream if this was done, leaving only a resolute 24%, there is no assurance that the former would keep to their words as pastimes such as swimming and fishing has become inherent within this class.

CONCLUSION

In my view, the best options available so far to check infection/reinfection are massive health campaign, raising peer clubs in schools, targeted chemotherapy every 3 months and aggressive molluscicide twice a year. If practised religiously and on long-term basis (over 5 years), considerable progress will be made as long as funds to utilize in such programmes are provided by the requisite agencies.

ACKNOWLEDGMENT

I wish to express my utmost appreciation to the Mrs. Adetula, Head Schistosomiasis control unit, Ondo state ministry of health for the assistance in providing the personnel. I also thank Miss E.T. Alade and Mr. M. Yesufu for assistance in the laboratory. The cooperation of the village King as well as the parents and the pupils is also acknowledged.

REFERENCES

Aryeetey, M.E., C. Aholu, Y. Wagatsuma, G. Bentil, F.K. Nkrumah and S. Kojima, 1999. Health education and community participation in the control of urinary schistosomiasis in Ghana. East Afr. Med. J., 76: 324-329.

Butterworth, A.E., 1990. Immunology of Schistosomiasis. In: Modern Parasite Biology. Cellular, Immunological and Molecular Aspects. David J. Wyler (Eds.), W.H. Freeman and Company. New York, pp: 262-288.

Editorial Acta Tropica, 2000. Post-transmission schistosomiasis: A new agenda, 77: 3-7.

Ejezie, G.C., E.I. Gemade and S.J. Utsalo, 1989. The Schistosomiasis problem in Nigeria. J. Hyg. Epidemiol. Microbiol. Immunol., 33: 169-179.

Lengeler, C., J. Utzinger and M. Tanner, 2002. Screening for Schistosomiasis with questionnaires. Trends Parasitol., 18: 375-377.

Stothard, J.R., A.F. Mgeni, S. Khamis, E. Seto, M. Ramsan and D. Rollinson, 2002. Urinary schistosomiasis in school children on Zanzibar Island (Unguja), Tanzania: A parasitological survey supplemented with questionnaires. Trans. R Soc. Trop. Med. Hyg., 96: 507-514.

Sturrock, R.F., 2001. Schistosomiasis epidemiology and control: How did we get here and where should we go. Mem. Inst. Oswaldo Cruz, 96 (Suppl): 17-27.

Ukoli, F.M.A., 1987. Attitudinal and behavioural aspects of epidemiology and control of parasitic diseases in Tropical Africa. Discourses Nig. Acad Sci., 8: 23-43.

Ukoli, F.MA., 1991. Introduction To Tropical Parasitology. Textflow Ltd., Ibadan, Nigeria, pp: 52-79.

Ukoli, F.M.A., 1992. Prevention and control of parasitic diseases in tropical Africa: The main issues. University Press PLC Ibadan, pp: 22-32.

World Health Organization, 2004. Schistosomiasis. Division of Control of Tropical Diseases, pp: 5.