

Original Research Article

Prevalence and knowledge, attitude and practices related to schistosomiasis among primary school children in Chaani village, North “A” District, Zanzibar

Kassim H. Haji¹, Prashanth K. Guddeti^{2*}

¹Department of Microbiology and Parasitology, International Medical and Technological University, Dar es Salaam, Tanzania

²Department of Microbiology, Dr. Ulhas Patil Medical College and Hospital, Jalgaon, Maharashtra, India

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***Correspondence:**

Dr. Prashanth K. Guddeti,

E-mail: prashanth8687@gmail.com

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ABSTRACT

Background: Schistosomiasis is a chronic, parasitic disease caused by blood flukes (*Schistosoma* species). It has been for along time a neglected tropical disease in most of the sub-Saharan countries.

Methods: A cross sectional descriptive study was conducted between June 2015 to July 2015 at Chaani village in North “A” District. The school children were interviewed to identify activities which expose them frequently to water contact. Study subjects were selected by using stratified random sampling technique. The selected school children were asked to collect urine sample in well-labeled container. The samples were processed in the laboratory by using standard microbiological techniques (syringe filtration then examined by microscopy) and results were recorded, the data was analyzed.

Results: Out of 170 School children 62 were infected with *Schistosoma haematobium* which is the predominant *Schistosoma* species found in that area. Among the 62, 45 (57.6%) were male and 17 (42.4%) were female. The level of knowledge of respondents on Schistosomiasis transmission is that 70% of school children have high knowledge, 18% have moderate knowledge and 12% have low knowledge. Other parameters were also assessed like bathing habits and knowledge and functions of Schistosomiasis control drug.

Conclusions: Males were significantly more affected by the disease than females. Provision of safe water coupled with education of the communities regarding the modes of transmission of the disease and the way to prevent oneself, as well as provision of sanitary facilities, such as latrines may decrease the disease burden.

Keywords: Urinary schistosomiasis, School children, River swimming, Blood flukes

INTRODUCTION

Schistosomiasis is a chronic, parasitic disease caused by blood flukes (Trematode worms) of the genus *Schistosoma* which affect bowel and urinary bladder depending on species.¹ Clinical manifestations of the disease and pathogenicity are attributed to perturbation of the host's immune system by parasitic antigens. The characteristic clinical presentation is terminal haematuria, usually associated with increased frequency of micturition and

dysuria. Diagnosis is made by finding the characteristic ova /eggs in the urine.²

The World Health Organization (WHO) estimated that schistosomiasis and soil transmitted helminths represent more than 40% of the global disease burden caused by all tropical diseases, excluding malaria. Schistosomiasis is the most common parasite transmitted through contact with fresh water. It is endemic in more than 70 low income countries where it occurs in rural areas and the fringes of

cities. The economic effects and health implications of schistosomiasis are extensive. Higher disease rates occur in children with infection frequently found in those under 14 years in many risk areas. *S. haematobium* (urinary) is a risk in more than 50 African countries (and is most prevalent in east Africa, particularly Lake Malawi).³ Based on 200 million infected people worldwide the total number of Disability Adjusted Life Years (DALY) lost to schistosomiasis is estimated at 1.532 million per year, of which 77% are in sub-Saharan Africa. New meta-analyses indicated a mortality estimate up to 280,000 deaths annually in sub-Saharan Africa alone. If the prevention and control of such diseases do occur, they are often uncoordinated and driven by the occurrence of a cluster of cases.⁴

Haematuria, the main indicator of *Schistosoma haematobium* infection was seen in 79.5% of 5 -14 years old children in 1986 and then increased up to 91% in 1990 for the same age group in Ungujaisland.⁵ In addition, in 1998 the prevalence of *Schistosoma haematobium* was found to be very high in the North Region of Zanzibar. It is ranged between 69.1% to 96% (ZSCP, 1998). Schistosomiasis is still remaining as a public health problem in North “A” District of Unguja Island. Although many efforts made by the Zanzibar Schistosomiasis Control Programme (ZSCP) like mass drug administration and health education to reduce Urinary Schistosomiasis Infection in the villages, the rate is decreasing very slowly. Both sexes of school children’s aged 7-14 years were most affected throughout the year.⁶ This situation could be attributable to presence of fresh water snails in the breedingsites preferably those visited by the children, inadequate knowledge on transmission of schistosomiasis,

non-compliance to the drugs given, community wrong perception with regards to mass drug campaigns, social and occupational activities and behavior of school children.

Therefore, this study has been under taken to find out the prevalence and determinants which facilitate persistence of schistosomiasis among school children. This study intended to determine the prevalence and potential factors contributing to the persistence of this disease among community members. Findings of the study will contribute towards help the community and Schistosomiasis control Programme officials to plan for appropriate and sustainable Schistosomiasis control activities in the area.

METHODS

A cross sectional descriptive study was conducted at Chaani village, North “A” District- Zanzibar from June 2015 to July 2015. During this period data was collected from the study area belonging to The Island of Zanzibar is situated in front of East Africa coast and is a part of the United Republic of Tanzania. This village has about 12,882 populations as per National Census, 2013. There are two PHC units which provide health services to the Chaani population and neighboring villages. Chaani has two Schools which cater for the entire population. These schools are located at Chaani Masingini and Chaani Kikobweni. Majority of people are peasants whose crops include cassava, banana, rice and coconuts. The variable of the study given (Table 1).

Table 1: The study objective and variables.

No.	Objectives	Variables	Indicators
1.	To determine proportion of children’s who are having urinary schistosomiasis infection in the study area in 2015.	Proportion of positive cases.	No. of positive and negative cases of <i>Schistosoma haematobium</i> .
2.	To assess knowledge of school children’s on transmission of urinary schistosomiasis.	Knowledge	Level of knowledge: High knowledge Moderate knowledge Low knowledge
3.	To assess children’s risk behavior or associated schistosomiasis transmission.	Risk behaviors	No of children involved in water contact activities.

The sample size (n=170) was statistically calculated by using a formula for estimation of population proportion (P). The population included in the study was school children aged 7-14 years attending primary school. They come from different parts of the village. Participating school children were obtained using stratified sampling technique. Those who picked the paper marked ‘Yes’ were selected as study subjects and others were excluded from the study. A Swahili structured interviewer administered questionnaire was used in data collection to obtain information from the study participants. Sample collection

and parasitological examination was carried out in Research Laboratory, Zanzibar Schistosomiasis Control Programme (ZSCP). Urine samples from Scholl children’s were collected and transported to the laboratory. Urine Examination was done by using standard microscopic technique. About 10 ml of urine sample drawn from each container by the use of syringe and this was filtered by the use of filter membrane (Nucleopore filter) then placed on microscope slide and examined under 10x and 40x objective to detect Schistosomes eggs, and results were recorded. Descriptive statistical methods were used to analyze the data.

Ethical and research clearance for this study was obtained from the college Research and Publication Committee (RPC) of the International Medical and Technological University (IMTU). Permission to conduct the study was sought from Second Vice President Office, Office of Chief Government Statistician and North “A” District Commissioner, Zanzibar. Also the investigator sought consent from the respondents before conducting the Interview and assured on Anonymity and confidentiality on the answers given by respondents. All positive cases were treated with Praziquantel.

RESULTS

Out of 170 School children 62 were infected with Schistosoma haematobium which is the predominant Schistosoma species found in that area. Among the 62, 45 (57.6%) were male and 17 (42.4%) were female. Males were significantly more affected by the disease than females. The age group with the highest prevalence is between 9-10 years with 57.6 (95% CI=93% to 107.3%) and the lowest prevalence is found between 13-14 years with 4.1% (95%=CI 1.1 to 7.1 %) respectively (Table 2).

Table 2: Schistosomiasis Prevalence with age and gender distribution of school children (n=170).

Age group (year)	Sex	Total screened	No. of infected	No. of uninfected	Prevalence (%)
7-8	M	13	6	7	52
	F	12	3	9	48
	M+F	25	9	16	14.7
9-10	M	50	20	30	51
	F	48	10	38	49
	M+F	98	30	68	57.6
11-12	M	30	18	12	75
	F	10	3	7	25
	M+F	40	21	19	23.5
13-14	M	5	1	4	71.4
	F	2	1	1	28.6
	M+F	7	2	5	4.1
Total	M	98	45	53	57.6
	F	72	17	55	42.4
	M+F	170	62	108	100

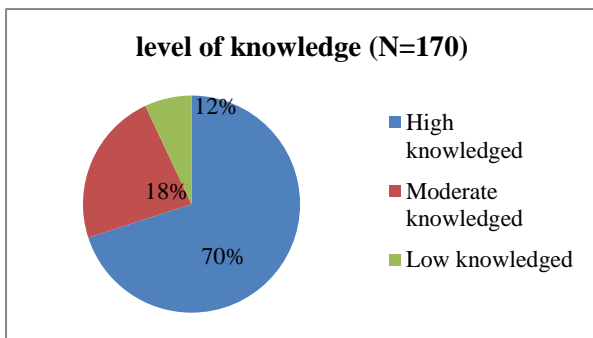


Figure 1: Level of knowledge of respondents on Schistosomiasis transmission.

It indicates that 70% (CI 95%=63.2% to 76.8%) of school children have high knowledge on Schistosomiasis transmission, 18% (CI 95%=12.2% to 23.8%) have moderate knowledge on schistosomiasis transmission and 12% (CI 95%=6.3% to 15.7%) have low knowledge on schistosomiasis transmission (Figure 1).

The areas where children are going for bathing 40% (CI 95%=32.6% to 47.4%) of school children get shower at their home followed by 35.3% (CI 95%=27.8% to 42.2%) at the river and 24.7% (CI 95%=18.2% to 31.2%) at the well (Figure 2).

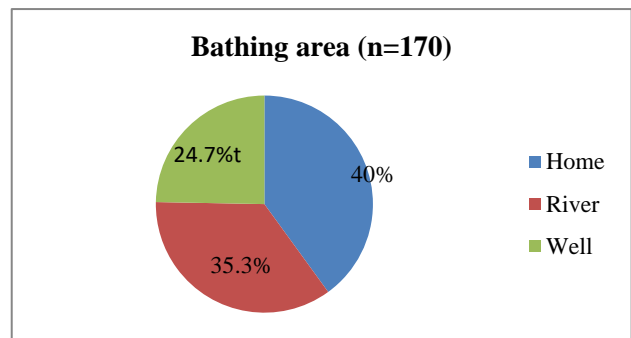


Figure 2: Distribution of bathing areas used by school children.

Concerning children’s risk behavior, there are different risk behaviors of school children’s regarding them on schistosomiasis transmission. It was indicated by the respondents from interview as the results shows in the table 3. Washing is the highest (33.5%) activity, (95% CI=26.4% to 40.6%) which poses children to schistosomiasis transmission risk followed by swimming by 31.2% (95% CI=24.3% to 38.1%). The activity featuring lowest (1.7%) is rice farming (95% CI =-0.2% to 3.6%) (Table 3).

Table 3: Distribution of frequently done activities by participants promoting *Schistosomiasis* transmission.

Water contact activities	School children (n=170)	
	No	%
Fishing	35	20.6
Bathing	22	12.9
Rice farming	3	1.7
Swimming	53	31.2
Washing	57	33.5
Total	170	100

Table 4: Awareness among school children regarding availability of mass treatment for *Schistosomiasis* in the community.

Respondents	Availability of mass drugs			%
	Yes (%)	No (%)		
School children	160 (94.1)	10 (5.9)		100
Total	160 (94.1)	10 (5.9)		100
Control drugs obtained				
Respondents	School	Home	Hospital	%
School children's	156 (91.8)	3 (1.8)	1 (0.6)	95
Total	156 (91.8)	3 (1.8)	1 (0.6)	94.2

Most of children members said mass drugs is available in the study area while few of them opposed that statement. The mass drug is available in the study area for 94.1% (95% CI=90.6% to 97.6%). Majority of children's receiving control drugs at school 91.8% (95% CI=87.7% to 95.9%) while few of them seeking at home 1.8% (CI 95%=0.6% to 3%) and hospital 0.6% (95% CI=-0.6% to 1.8%) (Table 4).

In assessing side effect of schistosomiasis control drugs, it was noted that high number of respondents 88.2% (95% CI=83.4% to 93%) have not suffer any side effect of the drugs provided by schistosomiasis control program while few 11.8% (95% CI=7% to 16.6%) complained to suffer some of side effect of the schistosomiasis control drugs. The majority of respondents 50% (CI 95%=42.5% to 57.5%) suffered stomach pain followed by dizziness 20% (95% CI=14% to 26%), vomiting 15% (95% CI=9.6% to 20.4%) and chest pain 15% (95% CI=9.6% to 20.84%). In assessing of knowledgeable on functions of schistosomiasis control drugs, the majority of children's members 85.3% (95% CI=80% to 90.6%), are knowledgeable, while few of them 14.7% (95% CI=9.4% to 20%) are unknowledgeable. Majority of children 94.1% (95% CI=90.6% to 97.6%) accept to continue receiving schistosomiasis control drugs while few of them 5.9% (95% CI=2.4% to 9.4%) did not accept schistosomiasis control drugs.

Limitation of the study is the collected information was based on respondent's opinion on the subject matter. Therefore, there might be errors due to exaggeration.

DISCUSSION

The study has revealed that the prevalence of Urinary Schistosomiasis among school children has increased reaching 100% as compared to previous study undertaken in the area which was reported to be 66.7% to 74.1%. The findings illustrated that males have been more affected than females. These findings are consistent with that of Adams et al who reported that occupationally males were more exposed to infection than females.⁹ However the same was argued differently by WHO 10that with the increasing age, male recreational water contact activities are reduced and females have increased water contact given their responsibility in domestic chores.^{9,10} Observation from the study area has shown that the risk behaviors responsible for human Schistosomiasis infections characterizing water contact activities example- washing, swimming, bathing and rice farming are almost shared by both sexes. This situation was common in the school children living in Chaani village which was a typical rural area. Children aged 9-10 years were frequently contacted in potentially infected water sources, hence increasing their risk of getting schistosomiasis. The results are consistence with that of Yuan et al.¹¹ Epidemiologically this situation is more or less consistent with the results of WHO indicating highest prevalence and intensity of infection beingfound in children aged between 10-15 years.

In Chaani, children reported going in the river in groups for recreation in the afternoon, the time when the cercariae are more active and ready to penetrate in the skin of human being. Evaluation shows that some children go to the river for playing and fishing, especially when they have no other places to go for playing (WHO, 1997).¹⁰ In this study, a large proportion of respondents hadknowledge about schistosomiasis transmission in the community. This finding is relevant to that reported by Midzi et al revealing that 65% of the respondents knew about the transmission of schistosomiasis.¹²

Washing and Swimming were the commonest activities performed by children in thestudy area, followed by fishing, bathing and farming. These activities are performed by children after coming back from school or in case of absent in school. Likewise, presence of surface water sources across the villages, people become attracted to pass on them, when coming back from agricultural activities especially those lacking piped water supply at their homes. It is contended by WHO that the risk of becoming infected with schistosomes also depends on other factors such as duration of contact degree of body exposure and time of the day.⁵

Regarding the availability of schistosomiasis control drugs in the community; majority reported that they obtain them from the school and that only a few had no access. Several other studies have reported varying findings as regard to schistosomiasis control drugs. Dener et al reported low availability of schistosomiasis control drugs in their

study.⁸ Following mass drug administration, majority of respondents that they have not suffered any side effect. However, other studies have reported that smell and size of tablet and use of height not weight to determining treatment regimens were raised as major factors that discouraged people from taking drugs.⁷

Majority of community showed willingness to continue receiving mass drugs administration at each recommended time to prevent and treat them from schistosomiasis given that in their daily activities they couldn't avoid contact with water bodies. Other study reported that lack of knowledge about schistosomiasis, cultural issues, as major source of problem so the motivation and compliance of both population and social workers tend to decline as morbidity become hardly visible.¹³

Limitations

Present study results were based on a relatively small sample size (n=170), The study subjects were school children of 7-14 age group and short (1 month) duration of the survey were limitations of the present study.

CONCLUSION

From this study it has been concluded that the presence of abundant *Bulinus* species, the intermediate hosts of *Schistosoma haematobium* coupled with the high water contact activities of children and adults either as recreational activities or agricultural activity maintains the longevity of the disease in Chaani village and the neighborhood despite having a schistosomiasis control program for the past 10 years. The rate of infection may increase in the coming years if “selective population Chemotherapy and application of molluscicide in the breeding site” is not considered. The Health education should focus on the cause and means of transmission as well as the consequences of untreated infections. Without provision of safe water, mobilization and education of the affected communities, as well as provision of sanitary facilities, such as latrines, schistosomiasis will remain a neglected disease in the most sub-Saharan countries.

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