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Awareness of Transmission, Complications and Protective Measures against Schistosomiasis among Paddy Cultivators

Ramadhan Adam Msigala[1], **Sarah Shali Matuja**[2], **Nicole T Shen**[3] **and Hyasinta Jaka**[2*]

[1]*Department of Medicine, The Benjamin Mkapa Hospital, Dodoma, Tanzania*

[2]*Department of Internal Medicine-Gastroenterology and Hepatology Unit, Catholic University of Health and Allied Sciences, P.O. Box 1464, Bugando, Mwanza, Tanzania*

[3]*NewYork-Presbyterian Hospital/Weill Cornell Medical Center, New York, USA*

[*]**Corresponding author:** Hyasinta Jaka, Department of Internal Medicine-Gastroenterology and Hepatology Unit, Catholic University of Health and Allied Sciences, P.O. Box 1464, Bugando, Mwanza, Tanzania, Tel: 255713640019; Fax: 255282500799; E-mail: yasintaliwa5@gmail.com

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Abstract

Background: Schistosomiasis infection is among the neglected tropical diseases seen in Sub-Saharan Africa causing acute and chronic infection by the trematode worms. Paddy farming and livestock keeping are major economic activities in Africa. Information is lacking on this target groups' relationship to schistosomiasis infection. The aim was to assess the awareness of schistosomiasis transmission, complications, and protective measures among pad cultivators.

Methods: A community based cross-sectional study done at Samuye, Singita and Manyada villages in Samuye ward, Shinyanga rural district, in the North West parts of Tanzania was conducted from September 2013 to January 2014. Subjects aged 10 years and above involved in paddy cultivation and livestock keeping were included. Three villages from Samuye district were randomly selected and interviews were done using structured questionnaires. Data obtained was analyzed using SPSS version 17.0 together with a series of tabulations.

Results: Of the 350 respondents enrolled in the study, 70.5% (247/350) endorsed awareness of schistosomiasis infection, most of which 86.9% (304/350) had completed primary education. Over 50% endorsed previously suffering from schistosomiasis, males being more affected than females, 57.7% (188/350) vs. 42.3% (162/350), respectively. Majority of previously infected subjects, 72.8% (131/180), opted for herbal remedies as compared to 22.8% (41/180) seeking hospital care. Nearly all subjects, 93.5% (231/247), lacked awareness of preventive options.

Conclusion: Schistosomiasis is one of the neglected tropical diseases, with significant knowledge gap among paddy cultivators in Samuye ward in disease treatment, complications and prevention in this high-risk group. Governmental emphasis on increasing awareness, education, and availability of prophylactic drugs to this high-risk group could prevent rates of transmission and establish infection control. Improving knowledge on schistosomiasis in this high-risk group would likely reduce disease burden significantly.

Keywords: Schistosomiasis; Neglected diseases; Bilharzias; Paddy cultivation; Tanzania

Background

Schistosomiasis or bilharzias is an acute and chronic parasitic infection caused by trematodes of the genus Schistosoma. It is among the Neglected tropical diseases (NTDs) in low to middle income countries, especially the tropics and sub tropic areas 1. About 700 million people have a worldwide risk of infection with 200 million people being infected in the low to middle income countries [1,2]. Over 90% of infections occur in people living in Sub-Saharan Africa with the highest prevalence among school aged children, adolescents, and young adults [3]. The two major Schistosoma species in Sub-Saharan Africa, Mansoni and Hematobium, are known to respectively cause intestinal and genitourinary disease. Both are commonly found in the Great lake zones in East Africa because the fresh water favors their intermediate host snails of genus Biomphalaria Bulinus [4].

In Tanzania, a study conducted in the Lake Victoria communities revealed the highest prevalence of Schistosoma Mansoni infection in Shinyanga, Mwanza and Kagera regions, 16.4%, 18.9% and 17.9% respectively [5]. Local data from Sengerema in North West Tanzania suggested a prevalence of Schistosoma Mansoni infection to be up to 64.3% among school children [6]. Transmission occurs when larvae forms released by intermediate hosts penetrate human skin.

Adult worms develop, and the eggs released are either excreted (in the urine or feces) or are trapped in body tissues, causing progressive inflammation and subsequent damage to the organs [1]. Lake Zone habitants are dependent on these water sources for domestic use, cultivation, or fishing activities, and paddy fields are important areas for transmission as rice, maize, and cotton are the most common cultivated crops in the Northwest regions of Tanzania. Studies in East Africa linked working in rice paddies to Schistosoma Mansoni with a prevalence of 20% [7].

Three key approaches targeting sanitation, health education, and mass treatment with praziquantel, could control schistosomiasis. Other interventions include promotion of hygiene, access to safe water, and

environment management [8]. The aim was to assess the awareness of schistosomiasis transmission, complications, and protective measures among paddy cultivators in Samuye ward.

Rationale

For many decades the prevalence of schistosomiasis is still high despite different mass interventions in various parts of Tanzania. Most of the studies done on schistosomiasis are mainly focused on Lake Shore areas by assessing the current disease burden among paddy cultivators, understand the awareness on transmission and protective measures against schistosomiasis. The information obtained will be useful in developing control strategies specifically targeting this group in terms of prevention and treatment.

Broad Objective

To assess the awareness of transmission, complications and protective measures against schistosomiasis among paddy cultivators.

Specific Objectives

1. To determine the awareness on transmission, complications and protective measures against schistosomiasis.

2. To determine how level of education affects individual's awareness on schistosomiasis infection.

3. To determine the proportion of people who were aware of the symptoms and seek for treatment.

Methodology

Study site

The study was conducted at Samuye, Singita and Manyada villages in Samuye ward Shinyanga rural district, in North West of Tanzania. The region is situated at the Lake Victoria basin one of the biggest fresh water lakes in the world. Shinyanga is traditionally an agricultural and livestock development region contributing 75% of the districts economy [9].

Study design and sampling procedures

A community based cross-sectional study design was employed and the year of study was from September 2013 to January 2014. The sample size included a population of 350 respondents from 10 years and above who were involved in agricultural activities. Three villages from Samuye district were randomly selected by rotary means and systemic sampling was done to identify ten cell leaders in each area for interviews.

Dependent and independent variables were selected that is, awareness of schistosomiasis infection and level of education, gender and prior history of schistosomiasis infection respectively. Interviews were conducted by moving from house to house using structured questionnaires and for those who declined or were mentally disabled were excluded. Yes or No responses on symptoms of schistosomiasis (urinating blood), methods of transmission (lake water contact), awareness of disease complications (vomiting blood) and protective measures against infection (wearing boots during farming) were employed from each respondent. Health education on schistosomiasis was given and other raised medical questions were answered. Personal identifications were removed before the analysis.

Data analysis

Data obtained was first entered in the Microsoft Excel sheet to generate data base which was exported in the SPSS version 17.0. For each knowledge item the number of respondents was expressed in percentages with a series of tabulations that gave the results of the study.

Ethical consideration

Permission was obtained from the district medical officer for approval and then to local authorities in Samuye ward. Individual consent and confidentiality was observed with no personal identification filled in the questionnaires.

Results

Social and demographic characteristics of the respondents

Of the 350 respondents interviewed, 53.7% (188/350) were men and 46.3% (162/350) were females. Subjects aged 10-24 years were most represented, 66.9% (243/350), with the elderly population (>69 years) composing less than 1% (2/350) of the study population. The majority of subjects were literate and had acquired basic primary education, 86.9% (304/350), with a minority of illiterates that is 11.4% (40/350) (Table 1).

Variable	Frequency	Percentage
Gender		
Male	188	53.7
Female	162	46.3
Age		
10 t0 24	234	66.9
25 to 39	82	23.4
40 to 54	24	6.9
55 to 69	8	2.3
>69	2	0.6
Level of education		
Illiterate	40	11.4
Primary	304	86.9
Secondary	6	1.7

Table 1: Social demographic characteristics of the respondents.

Respondents' knowledge on schistosomiasis, prior history of the disease infection according to gender and mode of treatment

Most 70.5% (247/350), were aware of schistosomiasis infection with 51.4% (180/350) endorsing disease morbidity. Majority of those

previously infected, 72.8% (131/180), used herbal medications for remedy from traditional healers (Table 2).

Variable	Frequency	Percentage
Endorsed awareness of disease		
Yes	247	70.5
No	103	29.4
Subjective disease morbidity		
Yes	180	51.4
No	170	48.6
Male	104	57.7
Female	76	42.3
Treatment facility		
Hospital	41	22.8
Herbals	131	72.8
None	8	4.4

Table 2: Knowledge of disease and prior history of schistosomiasis according to gender and mode of treatment.

Respondents' knowledge on transmission, symptoms, complications, and prevention of schistosomiasis infection

Of the 247 respondents aware of the disease, 62% (153/247) knew the mode of transmission. While most could correlate symptoms with disease, 58.3% (144/247), less than 1 in 5 knew disease complications, 18.2% (45/257). Nearly all respondents, 93.5% (n=231/247), were unaware of preventive measures (Table 3).

Variable	Frequency	Percentage
Transmission		
Yes	153	62
No	94	38
Symptoms		
Yes	144	58.3
No	103	41.7
Complications		
Yes	45	18.2
No	202	81.8
Prevention		
Yes	16	6.5
No	231	93.5

Table 3: Transmission, symptoms, complications, and disease prevention knowledge.

Discussion

The current study was conducted at Samuye ward in Shinyanga region among paddy cultivators. The mean age of the study subjects was between 10-24 years with male predominance in more than half of the subjects. The representation of this age group is mainly because majority of the people are actively involved in farming activities.

Most of the study respondents were aware of schistosomiasis infection. However, these findings contradict the lack of knowledge observed in Nigeria where fewer subjects were aware of urinary schistosomiasis infection [10]. Our respondents had acquired primary school education that signifies the impact of basic school education on awareness of schistosomiasis.

Awareness of transmission methods of schistosomiasis was observed in more than half of the subjects among those who endorsed disease knowledge. Similar results were seen in Ghana on knowledge of transmission in schistosomiasis in majority of subjects [11].

Half of the subjects reported a prior history of schistosomiasis infection with males being more affected than females. This likely underrepresents the infected population, as asymptomatic people are not identified. The male predominance in this current study is likely due to increased exposure to infected water sources secondary to farming activities. Similar findings were reported in a paddy cultivator population study in Uganda were predominately males were infected and excluded the asymptomatic population [12].

Surprisingly, majority of those previously infected were aware of the disease. Studies from Cameroon had similar findings that high level of knowledge about schistosomiasis was positively associated with infection [13]. However, this finding could be attributed to the fact that the target group received inadequate prior knowledge about the disease which was insufficient to cause significant impact in their behavior that would reduce the risk of infection. Additional studies from Tanzania have shown a high prevalence of schistosomiasis infection particularly among school aged children [6]. Hence, these people might have contracted infection during early childhood before they had information about the disease. The health education programs should focus on providing education for the purpose of both primary and secondary prevention of the disease in paddy cultivators.

This study highlights an obvious knowledge gap on complications related to schistosomiasis infection and appropriate treatment. Nearly 3 in 4 subjects reporting infection used herbal remedies for treatment. This contradicts studies done in Ghana where most infected patients received hospital care [14].

Knowledge on different preventive methods during paddy farming was significantly low for more than three third of the respondents. This was similarly seen in Ghana, the knowledge on prevention against schistosomiasis was generally low [11].

Conclusion

Schistosomiasis is one of the neglected tropical diseases, with significant knowledge gap among paddy cultivators in Samuye ward in disease treatment, complications and prevention in this high-risk group. Governmental emphasis on increasing awareness, education, and availability of prophylactic drugs to this high-risk group could prevent rates of transmission and establish infection control. Improving knowledge on schistosomiasis in this high-risk group would likely reduce disease burden significantly.

Limitations

The study involved on one region in Tanzania.

Competing Interests

The authors have declared that no competing interests exist.

Author Contributions

RAM did designing and data collections, SSM and NTS did the analysis while HJ was the supervisor of the project, wrote the manuscript and she is the corresponding author.

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