



Short Research Communication

Assessment of knowledge of transmission of Schistosomiasis and associated factors among the people of Mwaluphamba Location, Kwale County-Kenya

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The study aimed to assess the knowledge level of schistosomiasis transmission and other associated factors amongst the people of Mwaluphamba Location of Kwale County. A cross-sectional study design was used. Data was collected using a structured questionnaire from a sample size of 338 respondents. Results showed that majority of the respondents (98%) knew about schistosomiasis but most (71%) had no knowledge about infection transmission. 359 (94%) respondents knew of signs of blood in urine as the main symptom of schistosomiasis. A few (10%) of the respondents had access to safe water for domestic use. Sixty three percent of schistosomiasis infections occurred during the wet season and a 69% of the people in the area had contact with domestic water activities more than four times a week. In conclusion, the level of knowledge of transmission of schistosomiasis was quite low and there was a direct link between water-contact activities and transmission of urinary schistosomiasis. The community needs to be made aware of the modes of transmission of schistosomiasis infection through health education and strategies be developed to ensure the community can access safe water.

Key words: Schistosomiasis, knowledge, transmission, Kwale County

INTRODUCTION

Schistosomiasis is considered one of the neglected tropical diseases and the impact of this disease is second only to malaria as the most devastating parasitic disease (WHO, 2010). It is a major cause of morbidity and mortality in countries in Africa, South America, Caribbean, Middle East and Asia. The World Health Organization reported that approximately 80-90% of the 230 million infected persons in the world reside in Africa and the disease accounts for over 200,000 deaths per year in Sub-Sahara Africa (WHO, 2010).

Schistosomiasis is a parasitic, water-borne and chronic disease caused by a trematode of the genus *Schistosoma* which infects the large bowel or the urinary bladder depending on the species. The clinical signs and symptoms of the disease are caused by the body's reaction to the

presence of the eggs of these worms and depends on the location of the adult worms (Nordberg & Kingondou, 2007). *Schistosomiasis mansoni* and *Schistosomiasis haematobium* are considered to prominently occur in Sub-Saharan Africa especially among the poverty-stricken and remote areas. Occurrence of the infection in a given area is associated with the existence of many freshwater bodies that support the breeding of the intermediate host (Seydouet al., 2008).

In Kenya schistosomiasis is endemic and affects an estimated over six million people with the prevalence (5-65%) of the disease peaking in endemic areas (Midzi et al., 2011). Both *Schistosoma mansoni* and *Schistosoma haematobium* exist and are unequally distributed in several parts of Kenya and the coastal region in particular is a *Schistosoma haematobium* endemic area. Urinary

schistosomiasis caused by *Schistosoma haematobium* is a serious public health problem in Kwale County of Coast Province with a prevalence rate of 70% among school-going children (Kemri, 2001). Specifically, urinary schistosomiasis has a prevalence rate of 45% in Tsimba location and above 80% among school-aged children and an average prevalence of 18.2% among adults in Mwaluphamba location of Kwale County (Kemri, 2010 and Njenga et al., 2011).

Kenyan government in collaboration with Non-governmental organizations in the region have implemented mass treatment programmes to control the disease over a long period of time but the prevalence remains high. Previous studies have focused on disease prevalence, risk factors, knowledge on schistosomiasis among school children aged between 5–19 years as the main group at risk of the infection but not much has been done regarding adults and children below the age of five years who are not targeted by mass treatment programmes and may act as reservoirs for re-infection (WHO, 2010). There is also limited information regarding the community's level of knowledge on schistosomiasis transmission. Therefore, recent studies have recommended the use of an integrated approach to control schistosomiasis because the disease continues to be of public health concerns to the health sector in Sub-Saharan countries (McManuset al., 2011). In addition, knowledge of Schistosomiasis infection has been noted to have a significant impact on community's participation in transmission and control interventions (Tallo et al., 2011). Therefore, the current study is timely to shed light on the knowledge of Schistosomiasis transmission and other associated factors from the adult population point of view.

METHODOLOGY

Study area and population

The study was conducted in Mwaluphamba location, Matuga Sub County in Kwale County. Mwaluphamba location comprises of ten villages and 2848 households with an estimated population of 17,559 people (Kenya National Bureau of Statistics, 2009). The subjects of the study were drawn from all the ten villages in the area. The target population of the study comprised of all household heads who were aged eighteen years and over.

Study design and sampling procedure

A cross-sectional study design was adapted. A minimum sample size of three hundred and thirty-eight respondents was determined in accordance with the Fisher's Formula but up to three hundred and eighty-four study participants were included to cover for non-response. The sample size was distributed proportionately across the ten villages. Purposive sampling was used to select Kwale County as the study area because schistosomiasis is endemic in the

region. In Kwale County, Mwaluphamba location was purposively selected being the most affected area in Kwale County with high (80%) disease prevalence. Simple random sampling was used to recruit household heads in each village. Respondents were interviewed through use of a structured questionnaire.

Inclusion criteria

The study respondents were residents of Mwaluphamba location who had lived in the area for not less than 2 years. The study included both male and female participants aged 18 years and over.

Data collection procedure

A structured questionnaire was used to collect data from the respondents. The questionnaires were filled out when conducting interviews with the household heads in each of the selected households according to the list of households sampled in each village. The study was conducted between July and September of the year 2014.

Data analysis

Data was coded and entered into the Statistical Package for Social Sciences Software (SPSS) Version 20. Means and standard deviations were used for continuous variables, while frequency listings were used for categorical variables. The main independent variables for the study were the socio-demographic characteristics of the respondents including; age, gender, education level, religious status, occupation and income levels. The dependent variable was the knowledge of the respondents on transmission of infection and the associated factors.

Ethical considerations

Clearance was sought from the relevant authorities including institutional research and ethics committee of Moi University and from the local authorities in the study area. Informed consent was sought from the study respondents.

RESULTS

Socio-Demographic summary of the respondents

Knowledge of transmission of Schistosomiasis and other associated factors

Amongst the 384 respondents shown in Table 1 who were interviewed, 375 (98%) reported to have heard about schistosomiasis. A majority of the respondents, 272 (71%) claimed not to know how the schistosomiasis parasite was transmitted while 112 (29%) of the respondents reported that the parasite was transmitted through the human skin.

Table 1. Socio-demographic characteristics of respondents

Demographic characteristics of the respondents	Frequency(n=384)	Percentage (%)
Gender		
Male	231	60%
Female	153	40%
Level of Education		
Primary	216	56%
Secondary	26	7%
College	3	1%
No formal education	139	36%
Religion		
Muslim	325	85%
Christian	56	14%
Traditional	3	1%
Age		
18-24	51	13%
25-30	73	19%
31-35	49	13%
36-41	62	16%
Over 41	149	39%
Occupation		
Crop farming	169	44%
Livestock keeping	1	0.3%
Fishing	2	0.5%
Mixed Farming	169	44%
All the above	2	0.5%
Civil Servant	9	2%
Others sources of income	32	8%
Income Level in Ksh.*		
<1,000	203	53%
1,000-4,000	161	42%
5,000-10,000	17	4%
>10,000	3	1%

*\$1US Dollar=Ksh.101.09

Regarding the signs and symptoms of the disease, a majority of the respondents, 359 (94%) reported signs of blood in urine while 4 (1%), 11 (3%) and 9 (2%) of the respondents reported anaemia, lose weight and blood in stool as the signs and symptoms of the disease respectively.

More than half of the respondents, 232 (60%) reported to having one or more members of their family who had suffered from schistosomiasis infection. The majority of the respondents (60%) reported that women are mostly affected by the infection compared to their male counterparts.

Two hundred and seventy-seven (72%) respondents reported that most people seek treatment for schistosomiasis in health facilities while 7%, 4% and 17% would opt for self-medication, visit herbalists and resort to other treatment methods respectively.

Regarding their source of water for domestic use, most of the respondents 283 (74%) reported to get their water from the wells, 58 (15%) from the rivers/streams, 40 (10%) from water taps while the rest 3 (1%) from other sources. Two hundred and sixty-eight (70%) of the respondents reported that they fetch water for domestic use more than four times a week with 27% and 3%

visiting 2-4 times and only once a week respectively.

The majority of the respondents 347 (90%) reported that they did not treat their domestic water. Amongst those who claimed to treat their domestic water, 59% treated water by boiling while 40% used various chemicals to treat water. More than half of the respondents (63%) reported that schistosomiasis infection occurred mostly during the wet season while 12% and 24% reported infections being more frequent during the dry season and in all seasons respectively.

About 39% of the respondents claimed to come into contact with water when fetching water for domestic use. Other respondents (3%) claimed to come into contact with water when washing clothes and during agricultural activities (1%). Others activities mentioned that resulted in contact with water were swimming (36%), wading (15%), fishing (2%) and crossing water bodies (5%). Most of the respondents (69%) reported coming into contact with water more than four times a week, with 28% reporting water contact 2-4 times a week while the rest reported contact with water less than twice a week. On hygiene practices, 84% of the respondents claimed to wash their hands after visiting the toilet while another 13% of the

respondents reported use and ownership of toilet facilities.

DISCUSSION

The results showed that most of the respondents in Mwaluphamba location knew of schistosomiasis. However, about 71% of the community members did not know how the parasite was transmitted to the human body and this is similar to findings from studies by (Essa et al., 2012; Midzi et al., 2011 and Zang et al., 2011). A majority (96%) of the respondents in the current study also knew of the signs and symptoms of Schistosomiasis and this contrasted several other study findings which reported poor knowledge of the signs and symptoms of Schistosomiasis amongst community members (Dzidzo et al., 2011; Akogun, 1991, Bello and Idiong, 1982, Hewlett and Cline, 1997 and Onyeneho et al., 2010). The high level of knowledge on the signs and symptoms of schistosomiasis could be attributed to the significant (63%) number of community members with formal level of education. Nevertheless, the high level of knowledge of the signs and symptoms of the infection does not necessarily bring down the disease prevalence, this concurs with other studies which found out that increase in knowledge of the symptoms of infection does not necessarily reduce the disease prevalence (Aboagye and Edoh, 2009 and Mazigo et al., 2012).

Most (60%) of the study participants had family members who had suffered from an infection caused by schistosomiasis and a majority (72%) of those who were infected sought medical treatment from health facilities. This contradicts study findings of a study in Ghana by Dzidzo et al. (2011) who found out that it was a normal, harmless phenomenon and a rite of passage for boys and that it was a sign of manhood in another study in Nigeria (Akogun, 1991). Other study findings differed with the current study in that they reported a lack of need of seeking treatment from any other source (Bello and Idiong, 1982 and Hewlett and Cline, 1997). The study also revealed that the group most at risk of schistosomiasis were children 83% and this agrees with a study done by Essa et al. (2012) and WHO (2010) but contradicts findings from a study by Njenga et al. (2011). The notion of which group is most at risk makes adults feel less vulnerable to the infection. This in effect makes adults reluctant to take early precautionary measures against infection, hence, making them reservoirs of schistosomiasis in the community.

The study found out that only a small proportion (10%) of the community members had access to safe water for domestic use while the rest depended on use of unsafe water sources. Amongst the majority of community members who did not have access to safe water only 10% of them claimed to treat their water. These findings concurred with study findings from a study by Eshuis and Manschot (1993) who reported that where there was unsafe water then the prevalence of schistosomiasis is high and could affect control of the infection. The study also revealed that most (63%) infections occurred during wet

season and this could be attributed to the presence of several stagnant water pools, streams and rivers in the area. This was similar to the findings of studies done by Seydour et al. (2008) and Shati, (2009).

The study found that a majority (39%) of the community members were in contact with water while fetching water for domestic use with others in smaller proportions reporting contact with water when wading and swimming in water bodies, fishing, washing clothes and while attending to various agricultural activities. Most (70%) respondents were engaged in the aforementioned activities more than four times a week making them frequently in contact with water and therefore, predisposing them to schistosomiasis infection. These findings agree with other studies which reported that schistosomiasis is a disease of human behavior and that wading in water bodies increases the risk of infection (Haung and Manderson, 1992; Essa et al., 2012 and Charnock, 1980).

CONCLUSION AND RECOMMENDATIONS

The study concluded that a significantly high (71%) number of the respondents did not know the mode of transmission of schistosomiasis infection. The study found that environmental factors are associated with transmission of urinary schistosomiasis in the area.

The Kwale county government through the Kwale water service board to come up with strategies for ensuring that the community uses safe water for domestic use in the area. The environmental health department to mobilize and health educates the community on the mode of transmission of Schistosomiasis infection and the health effects of the infection. Health education should be extended to signs and symptoms of the disease, prevention and control.

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REFERENCES

- Aboagye I, Edoh D (2009). Investigation of the risk of infection of urinary schistosomiasis at Mahem and Galilea communities in the Greater Accra Region of Ghana. *West Afri. J. Appl. Ecol.* 15:9-15.
- Akogun OB (1991). Urinary schistosomiasis and coming of age in Nigeria. *Parasitological Today.* 7(2):62-73. [Crossref](#)
- Bello C, Idiong D (1982). Schistosoma urethritis: pseudo-gonorrhoeal disease in Northern Nigeria. *Tropical Doctor.* 12(3):141-142.
- Charnock A (1980). Taking Bilhaziasis out of the irrigation

- question. *New Civic Engineer*.
- Dzidzo R, Yirenya-Tawiah, Ted A, Otchere J, Bentum D, Edoh D, Amoah C, Kwabena M (2011). Urinary schistosomiasis among adults in the Volta basin of Ghana: Prevalence, knowledge and practices. *J. Tropical Med. Parasitol.* 34 (1):1-16.
- Eshuis J, Manschot P (1993). *Communicable Diseases: A manual for primary health workers*. Nairobi, Kenya: AMREF.
- Essa T, Birhane Y, Mengistu E, Moges A, Moges F (2012). Current status of mansoni infections and associated risk factors among students in Gorgora Town, North west Ethiopia. *ISEN Infection Diseases*. Hindawi Publishing Corporation: Ethiopia.
- Haung Y, Manderson L (1992). Schistosomiasis and the social patterning of infection. *Acla Topica*. 51:175-194. [Crossref](#)
- Hewlett BS, Cline BL (1997). Anthropological contribution to a community based schistosomiasis control project in Northern Cameroon. *Tropical Medicine and International Health*. 2(11):25-36.
- Kenya Medical Research Institute (2001). Preliminary report of the 8 selective mass-chemotherapy of urinary schistosomiasis in Mwachinga community of Kwale District, Coast Kenya: Kemri.
- Kenya Medical Research Institute (2010). *Neglected Diseases*. Unpublished report: Kwale.
- Kenya National Bureau of Statistics (2009). *National Housing and Household Population Census 2009*: KNBS.
- McManus D, Gray D, Ross A, Williams G, He HB, Yue – Sheng Li (2011). Schistosomiasis Research in the Dongting Lake Region and Its Impact on Local and National Treatment and Control in China. *Public Library of Science. Neglected Tropical Diseases*. 5(8):1053. [Crossref](#)
- Midzi N, Mtapuri Zinyowera S, Mapingure M, Paul M, Sangweme D, Hlerema G, Mutsaka M, Tongogara F, Makware G, Chadukura V, Brouwer K, Mutapi F, Kumar N, Mduluza T (2011). Knowledge attitudes and practices of grade three primary school children in relation to schistosomiasis, soil transmitted helminthiasis and malaria in Zimbabwe. *BioMedical Central, Infectious Diseases*.11:169.
- Njenga S, Mwandawiro C, Muniu E, Mwanje M, Haji F, Backaire M (2011). Adult population as potential reservoir of NTD infections in rural villages of Kwale district, Coastal Kenya: Implications for preventive chemotherapy interventions policy. *Parasites & Vectors*. 4:175. [Crossref](#)
- Nordberg E, Kingondu T (2007). *Communicable Diseases (4th Edition)*. Nairobi: AMREF.
- Onyeneho N, Yinkore D, Egwuye J, Emukah E (2010). Perception, Attitudes and Practices on urinary schistosomiasis in Delta State, Nigeria. *Tanzania J. Health Res*. 12:4. [Crossref](#)
- Seydou, Yaobi Z, Bosque E, Cesaire K, Amado O, Avtmis K, Albis G, Sellin B, Joanne P, Fequick A (2008). Two year impact of single praziquantel treatment on infection in the two national control on schistosomiasis in Burkina Faso. *Bulletin of the World Health Organisation*. 86:10.
- Shati (2009). Factors affecting the prevalence of human schistosomiasis in Aseer Region, Saudi Arabia. *Journal of Biological Sciences*. 9(8):815-819.
- Tallo V, Carabin H, Alday P, Balolong E, Olveda R, McGanvey S (2007). Is mass treatment the appropriate schistosomiasis elimination strategy. *Bullet of the World Health Organisation*.
- WHO (2010). *Weekly epidemiological record* 30 April No.18. 85:157-164. Available at <http://www.who.int/wer>.
- Zeng H, Yang X, Meng S, Wang H, Tang X, Zeng S, Jeschke S, Wang Y (2011). Awareness and knowledge of schistosomiasis infection and prevention in the three Gorges Dam reservoir area; A cross-sectional study on local residents and health personnel. *Acla Tropica*. 120(3):238-244. [Crossref](#)