Persistent Transmission of Schistosomiasis in Southwest Nigeria: Contexts of Culture and Contact with Infected River Water

Adetayo Olorunlana, PhD Candidate, Department of Sociology, University of Ibadan
Ibadan, Nigeria

Ayodele Samuel Jegede, PhD, Professor of Medical Sociology, University of Ibadan
Ibadan, Nigeria

Olajumoke Morenikeji, PhD, Lecturer, Department of Zoology, University of Ibadan
Ibadan, Nigeria

Adesola A. Hassan, PhD, Lecturer, Department of Zoology, University of Ibadan
Ibadan, Nigeria

Roseangela I. Nwuba, PhD, Lecturer, Department of Zoology, University of Ibadan
Ibadan, Nigeria

Chiaka I. Anumudu, PhD, Lecturer, Department of Zoology, University of Ibadan
Ibadan, Nigeria

Oyetunde T. Salawu, PhD, Lecturer, Department of Biosciences and Biotechnology,
Babcock University, Ilishan Remo, Ogun State, Nigeria

Alexander B. Odaibo, PhD, Professor, Department of Zoology, University of Ibadan
Ibadan, Nigeria

Correspondence may be directed to:
Adetayo Olorunlana, Department of Sociology and Anthropology, Igbinedion University, Okada
E-mail: maxwelltayo@yahoo.com.

Abstract

Transmission of schistosomiasis is aided by human behaviour. Globally, about 800 million people are at risk of schistosomiasis infection. Data exist on biomedical understanding of the disease transmission; there is a dearth of information from the social science perspective. Hence, this study explored the social and cultural context of schistosomiasis transmission among Yewa People in Nigeria. Qualitative methods were employed with purposive sampling, using the key informant interviews and focus group discussions, among 57 participants aged 17 to 54 years. The data were content-analyzed. River water was the most reported source of water supply among others. Participants drew from the cultural milieu the use of river water for "drinking" and "swimming" as part of the continual transmission of schistosomiasis. Transmission of schistosomiasis may not be abated without behavioural change.

Introduction

Schistosomiasis is a parasitic disease. It is also a major source of morbidity and mortality in developing countries in Africa, South America, the Caribbean, the Middle East and Asia (Njenga et al. 2014). Schistosomiasis, known as bilharzias, or snail fever is a very widespread disease in the developing world and the second most socioeconomically devastating tropical disease in the world after malaria (Kinunghi et al. 2014). The disease that has been recognized since the time of the Egyptian Pharaohs was first identified by Theodore Bilharz, a German surgeon working in Cairo in 1851. He discovered and identified the etiological agent *Schistosoma haematobium* (Nawal 2010). The disease can be found in areas where the water contains numerous freshwater snails, which may harbour the parasite and serve as the intermediate host between mammalian hosts (Alebie et al. 2014). According to Njenga et al. (2014), individuals within developing countries who cannot afford proper sanitation facilities are often exposed to contaminated water containing the infected snails.

Population at Risk

Globally, an estimated progression of 207 million people in 2010 to over 600 million people in 2014 were suffering from schistosomiasis infection (El Ridi et al. 2014; WHO 2013; WHO-TDR 2010), of whom 85% live in Africa, and another estimated 800 million people were at risk of infection in 76 countries where the disease is considered endemic (Van Dam et al. 2015; WHO 2010). Although schistosomiasis can be classified into four species, intestinal schistosomiasis and urinary schistosomiasis are the most common in Nigeria. In Nigeria, urinary schistosomiasis is known to have existed for a long time and might have been brought to the country by the migrants when they travelled westward from the Nile Basin (Cowper 1963).

World Health Organization (WHO 2013) reported that about 26.21% of the Nigerian population needed treatment; this indicated one of every four Nigerian. Although anybody can be infected with schistosomiasis, young individuals are mostly infected with peak prevalence and intensity of infection in the age group of 11–15 years (Anosike et al. 2006; Okoli and Odaibo 1999). The risk of infection is highest among those who live near lakes or rivers (IAMAT 2015). Schistosomiasis transmission may result into chronic illness that can damage the internal organs and, in children, impair growth and cognitive development (Negrão-Corrêa et al. 2014). Notably, schistosomiasis is a behaviour-related disease and could be explained through a theoretical view of the health belief model and has its association of risk infection to age, sex, occupation and patterns of settlement of individuals (Molyneux 2004), posing a great public health and socioeconomic threat in sub-Saharan Africa (Sangweme et al. 2010). Thus, increasing population size and corresponding needs for power and water supply led to the increase in schistosomiasis transmission (Besigye-Bafaki 2006).

Material and Methods

Research design

The study was descriptive and explanatory. The approach provides a better opportunity to understand the subtle and potentially important differences that may exist in the social and cultural beliefs of the participants, attitudes and opinions of the various participants on the phenomenon.

Objectives:

1. To explore the social and cultural context of schistosomiasis transmission in the study area.
2. To fill the gaps in the literature by explaining the reasons behind the unabated transmission despite several efforts to control the disease.
3. To provide baseline information for policy makers, in the case of further control program.

Study area

The study was carried out in Yewa North (formerly Egbado North) Local Government Area (LGA), Ogun State, Nigeria. It is situated in the west of Ogun State, Nigeria, bounded by the Ijebu-Ode and Republic of Benin in the west, Ewekoro LGA in the east, Imeko-Afon LGA in the north and Yewa South LGA in the south. Yewa North LGA has its headquarters in the town of Aiyetoro (or Ayetoro) at 7° 14'00" N 3° 02'00" E in the north-east of the area. It has an area of 2,087 km² and a population of 181,826 at the 2006 census, and the area is largely dominated by Yoruba-speaking people. The main occupations of the inhabitants are trading, timber logging and farming. The name "Yewa" is after the name of the Yewa River that passes through the area they inhabit. There are many flowing river bodies in the LGA, which serve as major sources of water supply. Thus, there are high human–water contact activities with rivers, which include bathing, swimming and other domestic usages.

Study population

Nine key informant interviews (KIIs) (among three religious leaders, two community health workers, two public school teachers and two traditional healers) and eight focus group discussions (FGDs) (among four male groups, where two groups were youths and two were adults in rural and urban areas; and four female groups, where two groups were youths and two other groups were adults in both rural and urban areas) were conducted.

Sampling technique

Qualitative sample was used using KII and FGD.

Inclusion criteria

Participants must have lived in the area for at least 10 years.

Exclusion criteria

Residents in the study area that have not lived in the area for at least 10 years were excluded.

Instruments

The KII and FGD guides' research instruments elicited information from the participants on sources of water, transmission of schistosomiasis disease and the role of social and cultural belief on the continual transmission of schistosomiasis disease.

Method of data collection

The data collection for the study entailed KIIs and FGDs with the participants. A detailed interview guide informed the discussion for all KIIs and FGDs, although interviewers and interviewees were allowed to deviate from the prepared guide as new themes emerged from the conversations. The interview and discussion sessions were digitally recorded.

Methods of Data Analysis

The data were analyzed with Nvivo software version 8, and content analysis guided interpretation of the data. Content analysis, as resides in the devising of precisely and clearly defined categories that apply to the material analyzed in accordance with explicitly formulated rules and procedures (Ball and Smith 1992), was also used. Prior to coding, transcriptions were read and re-read. The next step was coding the data using "sensitizing concepts" (Blumer 1969). A sensitizing concept was basically a working tool for this analysis. It was not set in stone and could be revised or elaborated to the topic being studied. The researchers then proceeded to the two phases of coding: "initial" and "selective or focused coding" (Charmaz 2002). These approaches allowed for free association of thematic issues and adoption of frequently reappearing initial codes in sorting and synthesizing large amount of data. Reliability was achieved by the use of "inter-coder reliability." We have shown that our assessment was recognized and agreed upon by others, as other observers were asked to review the analysis and see if they agree with our conclusions.

Results and Findings

Participants' profiles

Fifty-seven residents in the communities (30 participants in urban areas and 27 in rural areas) participated in the KIIs and the FGDs (31 males, 26 females). Participants with ages ranging from 17 to 55 years and an average range of length of residence in the community of 11 years were interviewed. Most participants were males (54.4%). Most of the participants were either Christians (49.0%) or Muslims (44.6%), with few representing the traditional religion (6.4%). A majority of the participants (38.4%) were farmers, followed by students (28.8%). More than half of the participants had at least secondary school education (61%). Please see Table 1 for details.

Sources of water and schistosomiasis transmissions

Participants acknowledged the patterns of interactions with stream as a source of water supply. Some had river water as their only source of water supply and claimed that other sources of supply are absent. According to a participant, "We drink water from the river here; there is no borehole here" (Adult male, FGD, rural). Similarly, a public school teacher from the same area corroborated this view and ascertained that the majority of the people depend solely on this same source of water. In her words: "Majority of the people here use river water, for drinking, washing, swimming and all other cleaning activities that demand water" (Public school teacher, KII, rural).

Others reported the availability of other sources of water, such as pipe-borne water and the use of pure water. According to one FGD report, the participants were aware that water from the river is associated with some diseases. The participant reported thus: "We do fetch water from the pipe borne water if there is electric power supply. So many people also buy pure water; because they say,

water from the river carries some disease" (Adult Female, FGD, rural).

Similarly, another participant from an urban area noted that they were used to river water before, but they now use borehole water instead. In his view, this must have occurred because of civilization: "In this community our source of water supply before civilization of getting borehole, was majorly from the river. But now, to cook, bath, wash and do other house work, people use bore hole instead of river water" (Religious leader, KII, urban).

Table 1. Demographic sketch of participants in rural and urban area

Variables	Rural	Urban	%	Total
Gender				
Male	13	18	54.4	31
Female	14	12	46.6	26
Age range				
Low	17	20	–	–
High	55	40	–	–
Educational level				
No education	6	0	10.0	6
Primary education	5	6	19.0	11
Secondary education	12	14	46.6	26
Post-secondary education	4	10	24.4	14
Religion				
Christianity	14	15	49.0	29
Islam	11	13	44.6	24
Traditional	2	2	6.4	4
Occupation				
Unemployed	0	3	5.0	3
Trader	7	0	12.8	7
Farmer	10	12	38.8	22
Teacher	1	1	3.2	2
Clergy	1	2	5.0	3
Student	6	10	28.8	16
Health worker	1	1	3.2	2
Traditional healer	1	1	3.2	2
Total number of participants	**27**	**30**	**100%**	**57**

Preference for river water: a pointer to continual schistosomiasis transmissions

Conversely, despite the availability of other sources of water, some participants describe their preference for river water. The reasons are not far-fetched, because to some, the pipe-borne water does not look fresh and sometimes it is "hard" when being used for drinking and household activities. According to a participant:

> We have pipe borne water here, we also have river water. Taking a lead from the Yoruba culture, people prefer to drink water from the stream to that of the pipe borne water. This is because the pipe borne water is sometime hard, and has taste, when it is being used for drinking. (Traditional healer, KII, rural)

Pointedly, interaction with stream or river water may continue unabated because of the cogent reasons given by different participants in this study. This is despite the fact that it has been scientifically proven that such contact aids schistosomiasis transmission. Moreover, the pattern of interaction with streams and schistosomiasis infection was summarized by the words of a health worker thus:

> Schistosomiasis is contacted through river water, which has snails that carried the infection. Whenever a person goes to the river to bath, the infection may be on the leaves that are on the river, or, even on the sand that is on the river, once a person is walking on it, the disease penetrates through the skin, from the skin to the blood stream and then to the bladder. But our people belief that schistosomiasis is contacted through dogs which they called *Àtòsíajá*. (Health worker, urban)

The youth participants in the focus group in rural areas emphasized their view on sources of water and its influence on schistosomiasis infection: "everybody likes to go to the river to play in the river." All other participants affirmed that they do go to the river "to play." The pattern of interaction is further enumerated by the experience of infected persons.

Discussion of Findings

This study explored why schistosomiasis transmissions continue despite the effort to control the infection. The data suggest that interaction with streams was coincidentally a major cause. As such, participants attest to this fact and one of the ways suggested by data is contact with infected river water. In fact, a participant unambiguously commented, "schistosomiasis is contacted through water; I mean river water, which has snails that carry the infection," and majority consented with this assertion. However, there exist oral tradition and cultural belief that the disease is being transmitted through dogs' urine, locally termed as "*Àtòsíajá*," a word that literally connotes dog gonorrhea.

It is postulated that cultural belief may act as a means of continual transmission of schistosomiasis. As such, the schistosomiasis control/elimination program (Bergquist et al. 2015) should include social and cultural understanding of people's behaviour, to avoid constant re-infection after treatment (Negrão-Corrêa et al. 2014).

Contact with infected water in the study area may have influenced the experience of infected persons on schistosomiasis. It is speculated that their exposure to river water may not only be because of ignorance but also poverty, as the source of water "before civilization of getting bore hole, was majorly from the river." Ugochukwu et al. (2013) noted that rivers and ponds, with divers' freshwater environment, offer favourable habitats for aquatic snails that serve as an intermediate host for schistosomiasis. As such, living in this environment without other sources of water supply can lead to a high prevalence of schistosomiasis disease.

In 2004, prevalence rate of schistosomiasis in the study area was calculated to be 25.0% (Ekpo and Mafiana 2004), while in 2012, it scaled up to 54.8% (Hassan et al. 2012) in the same study area. Notably, if the condition that predisposes people to infection had not changed, as affirmed by "we drink water from the river here," intrinsically, schistosomiasis transmission and its prevalence rate will intensify.

As reported by participants in the study, there were also other sources of water supply, such as electrically generated pipe-borne water (in the rural areas where supply of electricity is erratic) and borehole water (in the urban area where such belong to the wealthy, because of the cost of installing one). It is assumed that lack of accessibility to pipe-borne water and borehole water was the reason why the vast majority of the people make use of river water. However, some participants' decision to choose river water irrespective of the availability of other sources confirmed cultural context around river water "*omiafòwúròpo*," a word that socially connotes fetching early morning water, which is culturally believed to be fresher than any other time of the day. As such, the presence of other sources of water may not make any difference, as "people prefer to drink water from the stream to that of the pipe borne water" (Traditional healer, rural).

Conclusion

There are limitations to this study. The sample was small and geographically limited to Yewa North LGA. Invariably, experiences described by participants cannot be generalized to cultural context of schistosomiasis in other communities. It was beyond the scope of this article to examine the impact of the disparity in access to water sources among participants owing to living in rural versus urban areas, especially as it relates to

deliberate prevention of schistosomiasis. Also, this article did not delve into the questions of other forms of causation apart from the one mentioned by the participants, so a further study could be proposed on cultural perceived causation of schistosomiasis disease.

Notwithstanding the limitations, this current study contributes to the understanding of the role that cultural context may play in schistosomiasis transmission among the study area. Therefore, culture can provide valuable insight into future schistosomiasis control/elimination programs. Thus, policies on schistosomiasis control and elimination programs can benefit from understanding cultural context. As behaviour does not occur in a vacuum outside of culture, policies should take advantage of this context and its influence on schistosomiasis transmission. Consequently, WHO policies on schistosomiasis elimination can be strengthened through working with social scientists. Such social scientists, for example, sociologists and anthropologists, can be a resource to schistosomiasis control programs in this context, as they can serve as a link between community knowledge and scientific explanation, not only in the education of the community members about mode of transmission but also providing them with cultural adaptation strategy that may ensure reversal of re-infection of schistosomiasis. We anticipate that, without a careful understanding of the cultural context of schistosomiasis transmission, control program or elimination proposal of the disease may remain a continual dilemma, if not totally difficult.

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