Perceptions and assessment of risk factors in Schistosoma haematobium infection in Buruku and Katsina-Ala Local Government Areas of Benue State-Nigeria

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Abstract
Schistosomiasis is one of the neglected diseases in tropical Africa that continues to plague inhabitants of sub-urban and rural areas where there are little or no safe water outlets. This study investigated urinary schistosomiasis infection in relation to knowledge, attitudes and practices of people in Buruku and Katsina-Ala Local Government Areas of Benue State, Nigeria. Using standard parasitological method (Filtration technique) to examine the urine, 335 (44.66%) were infected with Schistosoma haematobium eggs out of the 750 urine samples examined from school children and communities. Questionnaires were administered to each participant to collect information on socio-demographic data, knowledge on the causes of urinary schistosomiasis and risk factors in Schistosoma haematobium infection. Children of farmers recorded the peak of infection with 159 (24.37%). Inhabitants of the area mostly linked the disease to other causes like drinking dirty water 195(29.63%) among whose 115 (17.47%) were infected, playing in water 118 (17.93%) among whose 67 (10.18%) were infected, eating unripe fruits 72 (10.98%) among whose 30 (4.00%) were infected. Subjects’ knowledge about the role that fresh water snails play in transmission was low 38 (5.77%). 116 (25.22%) were recorded not having any idea of the cause of the disease and 70 (9.33%) were found infected. Activities like swimming, bathing/playing in water, washing and collection of edible snails from stream, ponds or river significantly correlated with the prevalence of Schistosoma haematobium infection (P < 0.01) and could be identified as risk factors in the area. There is an urgent need for the launching of a schistosomiasis control programme and development of human resources and materials for health education to decrease the frequency of water contact activities.

INTRODUCTION
Schistosomiasis, also known as bilharziasis is the second most common parasitic disease in the world after malaria. Schistosoma haematobium the causative agent of urinary schistosomiasis develops alternately in humans and fresh water snails. It is estimated that in sub-Saharan Africa, some 436 million are at risk of infection from Schistosoma haematobium, of which 112 million are infected (Van der werf et al., 2003).

In Benue State, Nigeria and particularly in the Tiv land, the perceptions that communities have of the potentially deadly disease of urinary schistosomiasis could make challenging the implementation of a control programme. Rice farming during wet season, exploitation of river banks for garden purposes during dry season, dependence of the inhabitants on streams and ponds for drinking water, cooking, washing and recreation are such factors that could contribute to the endemicity of the disease in the area. However, this study was conducted with a view to providing relevant information on the intensity of Schistosoma haematobium infection in relation to socio-economic status, perceptions of the inhabitants and the risk factors that could expose them to infection.

MATERIALS AND METHODS
STUDY AREA
The study area was made of two Local Government Areas (Buruku and Katsina-Ala) of Benue State, Nigeria. The relative position of these two Local Government Areas in Benue State is about the middle eastern of the state. The area has a monthly temperature between 27, 38°C and 28, 00°C and may go up to a maximum temperature of 30, 08°C and 34, 24°C. The area receives 900–1000 mm of rain annually. The dry season starts in late October and usually ends by March. The rainy season which lasts from April to early October is the period of intensive agricultural activities when
the indigenous people of the areas mainly Tivs and Etulo are engaged in farming of crops like yams, guinea corn, maize, rice, sesame and cassava which are the principal food crop and cash crop.

SAMPLES COLLECTION AND EXAMINATION

Prior to the commencement of the research, permission was sought from the Chairmen and local education authorities of both Local Government Areas. A total of 750 urine samples were collected from 372 males and 378 females aged 3-70 years. Participants were from communities (250), primary schools (250) and secondary schools (250). The study was conducted between November 2008 and March 2009. Eggs of Schistosoma haematobium were recovered using filtration technique (Cheesbrough, 2000) and examination was done using the x10 and x40 objectives under a microscope.

QUESTIONNAIRE DESIGN AND DATA ANALYSIS

A survey form consisting of twelve (12) questions relevant to urinary schistosomiasis on socio-demographic data, water contact activities and K.A.P (knowledge, attitudes and practices) was administered to each participant. Pre-schools children that participated in the study were excluded for interview and their mothers were asked to provide relevant information on their water contact activities. Using the form, some of the primary school children were interviewed individually and some of the questions were communicated to them in the local language for ease of understanding with the assistance of a local health worker. SPSS version 15.0 for windows and Microsoft Excel 2007 were used for data analysis.

RESULTS

Table 1 shows the prevalence of Schistosoma haematobium infection in the study area. An overall prevalence was 335(44.66%) out of the 750 subjects examined. Children attending secondary schools recorded the peak prevalence with 129 (17.20%) followed by primary school children 110 (14.66%). The communities recorded an infection of 96 (12.80%). Males recorded higher prevalence rate 186 (24.80%) than females 149 (19.56%). No significant differences were observed between Schistosoma haematobium infection in school children and communities, and between males and females ($X^2=22.04$, $P > 0.05$).

Table 2 elucidates the prevalence and intensity of Schistosoma haematobium infection in relation to paternal occupations. Children of farmers recorded the highest infection rate of 36.80% while children of nurses recorded the least infection with 0.40%. No significant difference was observed between infection and parental occupations ($X^2=44.38$, $P>0.05$).

Table 3 summarizes the subjects’ explanations for the causes of urinary schistosomiasis in relation to infection. Subjects’ knowledge about the role that fresh water snails play in transmission was low. Only 38(5.77%) understood the role of fresh water snails as vectors and among these 17(2.58%) were found infected. Subjects were more likely to link the disease to other causes such as drinking dirty water 195(29.63%) among whose 115(17.47%) were infected, playing in water 67(8.93%) among whose 67 (10.18) were infected, eating unripe fruits 72(10.98%) among whose 30 (4.00%) were infected. 166(25.22%) were screened not having any idea about the cause of the disease and 70
(9.33%) were found having Schistosoma haematobium eggs. No significant differences were observed in the subjects’ explanations for the cause of urinary schistosomiasis and infection ($X^2 = 35.78, P>0.05$).

**Figure 3**
Table 3: Intensity of infection in relation to subjects’ explanations for the cause of urinary schistosomiasis

The effects of water contact activities on the prevalence of urinary schistosomiasis are given in Table 4. Responses from the questionnaires indicated that those involved in playing/bathing recorded an overall infection rate of 243 (40.40%), followed by those involved in washing 301 (40.13%) and swimming 226 (30.13%). Those involved in rice farm activities recorded an infection rate of 213 (28.40%). An infection rate of 106 (14.13%) was observed among those that used to collect edible snails from ponds, streams or river. Significant associations were found between water contact activities and prevalence of infection ($r = 0.103$, for swimming; $r = 0.128$, for washing; $r = 0.185$, for playing/bathing; $r = 0.149$, for collection of snails. $P < 0.01$)

**Figure 4**
Table 4: Effects of water contact activities on the prevalence of urinary schistosomiasis

**DISCUSSION**

The present study reveals a relatively high prevalence of Schistosoma haematobium infection in the area. This is, however, closely related to the findings of (Ngele and Oyeukwu, 2008; Oniya and Olofintoye, 2008) who carried out similar surveys in Ebonyi and Ondo States respectively. School children appear to be more predisposed to Schistosoma haematobium infection than communities. This indicates a common pattern of behavior and susceptibility for these children. These children often more of their leisure time playing, swimming or fishing in the river, streams or ponds. They are also more often in contact with infested water bodies through the collection of edible snails. The high prevalence observed among males of school children corroborates the findings of Anosike et al. (2006).

Parental occupation has influence on the prevalence of infection. Children of farmers had the highest peak of infection, this could be attributable to the constant contact with contaminated water bodies during their recreational activities or when they are taking along with their parents in
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Conclusions and Recommendations

The present study showed that community perceptions can have a marked effect on the success of scientific interventions. Thus, due to the devastating effects of urinary schistosomiasis on physical and mental conditions of infected people, relief from the burden of Schistosoma haematobium infection could be facilitated by a better knowledge of the epidemiology of the parasite and its pathogenicity. It is therefore recommended that

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References


r-8. Van der werf, MJ, de Vlas, SJ, Brooker, S, Looman,
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