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Current status of schistosomiasis in Sokoto, Nigeria

Kiran Singh [a,*], Dalhatu Muddasiru [b], Jitendra Singh [c]

[a] Department of Biological Sciences, Usmanu Danfodiyo University, Sokoto, Nigeria
[b] Department of Biological Sciences, Umaru Musa Yaradua State University, Katsina, Nigeria
[c] Department of Family Medicine, Usmanu Danfodiyo University Teaching Hospital, Sokoto PMB 2346, Nigeria

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ABSTRACT

The study was conducted in poor communities, where most of the population is dependent on river and well for their everyday activities. In this study 5 years–15 years aged children were sampled for schistosomiasis (Urinary and intestinal), using of urine and stool samples. The stool samples were analyzed using kato-katz thick faecal smear technique while the urine samples were analyzed by filtration technique. The overall prevalence of urinary schistosomiasis (*Schistosoma haematobium*) was 60.8% (228 positive cases in 375 samples), and for intestinal schistosomiasis (*Schistosoma mansoni*) was 2.93% (11 positive in 375 samples). The order of infection based on social status (occupation of pupil's parents) was farmers > fishermen > traders > civil servents > others. The prevalence of infection based on pupil's water contact activities such as farming associated 84.87% urinary schistosomiasis, followed by swimming (78.21%). Occurrence of urinary schistosomiasis based on source of pupil's drinking water; highest infection was reported among those that drink dam water (75.24%) while least infection was occurred whose drinking water was from bore-whole (17.64%). Prevalence of urinary schistosomiasis in the studied area is therefore very high and family status, means of water contact and availability of drinking water dependent. Therefore there is urgent need to adapt preventive measures, provision of safe drinking water as well as control programmes for vector snails, immediately.

1. Introduction

Schistosomiasis (Bilharziasis as "the infection was first described by the German physician Theodor Bilharz") is a water borne parasitic disease caused by *Schistosoma*, the digenic trematode found in the blood vessels of man and livestock. About up to 252 million individuals might be affected worldwide with the disease (Utzinger et al., 2015).

The six species of *Schistosoma* that cause disease worldwide, include *Schistosoma haematobium, S. mansoni, S. japonicum, S. intercalatum, S. mekongi* and *S. guineensis* (Uko et al., 1993; Agi and Okafor, 2005), each having a well-defined distribution which is important in diagnosis. Among which three SPP *S. haematobium, S. mansoni* and *S. japonicum* account for >95% of all human cases of schistosomiasis found in the world (Mutapi et al., 2003). In Nigeria, three species (spp.) are pathogenic to man, these are: *S. haematobium, S. mansoni* and *S. intercalatum*.

* Corresponding author.
E-mail address: ksinghj@gmail.com (K. Singh).

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The disease caused by *S. haematobium* characterized by bloody urine, lesions and calcification of bladder, kidney failure and bladder cancer in children (Butterworth, 1997; Norberg, 2004), and is the major cause of female genital schistosomiasis (FGS), which is a risk factor for transmission of sexually transmitted diseases including HIV (TDR, 1996; Raven and Jahnson, 2002); while the *S. mansoni* infection is characterized by bleeding from gastro – oesophageal region, splenohepatomegaly, persistent bloody diarrhoea, pain, growth retardation, delayed sexual maturity and chronic dermatitis (Norberg, 2004; WHO, 1998).

The life cycle of schistosomes requires the presence of fresh water snails, of species of *Bulinus, Biomphalaria, Planorbis, Oncomelania, Lymnaea* and *Indoplanorbis* (Tierney et al., 2005). Human and other animals get infection due to cercarial penetration through skin, when comes in contact with water infested with cercaria larva of schistosomes.

Though the disease kills few people, its clinical effects, prevalence and association with agriculture and water development projects, movement of population and increase in population density makes it a problem of great public health importance (Steinmann et al., 2006).

Globally, the disease is in the increase in both prevalence and incidence because of.

Expansion of Irrigated Agriculture which provide habitats for vector snails, the construction of hydro-electricity generating sites, lack of good sanitary habits and lack of safe water for the growing population (Tierney et al., 2005).

Schistosomiasis is a very focally transmitted disease due to the aforementioned life cycle and it need for contact with freshwater intermediate hosts. Both intestinal and urinogenital schistosomiasis occur in Nigeria. Previous research has documented prevalence rates between 14.2% and 91.4% (Nnoruka, 2000; Ozumba et al., 1989; Houmsou et al., 2012; Nwabuez and Oapara, 2007; Umar et al., 2008; Kabiru et al., 2013).

In study area, there is insufficient knowledge of factors associated with schistosomiasis transmission; poor sanitary habits, and insufficient safe and potable water, which give rise to chances to create more transmission foci. The present study was conducted to have knowledge of current prevalence rate of disease among habitants.

2. Materials and methods

2.1. Study area

The study was conducted in two districts of Sokoto State viz. Sokoto metropolis and Hamma Ali, Sokoto town is located on latitude 13°′02″N and longitude 05°′13″E in the upper north western part of Nigeria, covering about 677 km^2. The area generally experience high temperature throughout the year, the rainy season lasts from June to September each year (Topographic Sheet, 1990).

The water supply in the town is mainly from water board pipes, bore holes and wells. Sewage disposal is by pit latrine within the compound and refuse disposal is by open dumping system outside the house and subsequent burning (Topographic Sheet, 1990).

2.2. The study population

The study was carried out between May 2012 and March 2014. From the localities three primary schools were randomly selected, since the disease occur mostly in school aged children and it is easy to get required number of samples at such places. Stool and urine samples were collected from 125 pupils in each school. All the children examined in this study were aged between 7 and 13 years attending primary school at the time of investigation. The study was carried out to determine the proportion of children capable of excreting schistosomes eggs that are potentially high enough to contribute in the transmission process.

2.3. Sample collection

Urine and stool sample were collected mainly from school aged children because of their high risk of schistosomiasis infection. The infection status of this group gives a reliable reflection of the general situation of the diseases in an area (Mafiana and Adesanya, 1999; Akogun and Obadiah, 2000).

Three schools were randomly selected. From each selected school, 125 children were randomly screened for intestinal and urinary schistosomiasis giving a total number of 375 samples each for urine and stool. For each child examined, a questionnaire (parasitological screening record) aimed at determining the water contact activity, parental occupation and source of drinking water was recorded.

Urine samples were collected between the hours of 10:00 am–2:00 pm and stool sample were collected in the morning since eggs output from infected persons riches peak value around that time of the day (Grist et al., 1998; Rubin and Faber, 1999).

Clean labeled specimen bottles were used for the collection of urine samples small and clean, small plastic cups with cover were used for stool collection. Care was taken to number the containers. Specimen bottles and plastic cups were numbered accordingly, such that they correspond with numbers of the subject, on the questionnaire record. Stool samples were preserved with 10% formalin solution while urine samples were preserved with 1% domestic bleach (Ladan et al., 2011). The samples were taken to the Parasitology laboratory, Department of Biological Sciences, Usmanu Danfodiyo University Sokoto and examined for *Schistosoma* infection.