Mild Haematuria among School Children in an Urban and Two Rural Ijebu Communities, Southwest Nigeria

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Abstract: The occurrence of mild haematuria was investigated among school children in an urban and two rural Ijebu communities of Ogun State, southwest Nigeria. A total of 921 (457 males, 464 females) school children aged 3-18 years were interviewed using a questionnaire and had urine samples collected from them between 11.00 and 13.00 hrs from June 2005 to July 2006. Each urine sample was observed for gross haematuria and thereafter tested for mild haematuria using a diagnostic reagent strip. The pooled prevalence of mild haematuria was 22.6%. The prevalence of mild haematuria in the urban centre (16.9%) and the rural communities (26.9%) were statistically similar ($\chi^2 = 2.28$, P>0.05). The prevalence among males (23.9%) was not significantly different from that among females (21.3%) ($\chi^2 = 0.15$, P>0.05). 17% of the school children with mild haematuria indulged in swimming and bathing in streams and ponds, 8.5% had experienced bloody urine, while 10.6% were swimming and bathing in streams and ponds and had also experienced bloody urine. We concluded that reliable rapid indirect diagnosis of Schistosoma haematobium infection in the study area will require a combination of history of haematuria, observation of gross haematuria and testing for mild haematuria.

Key words: Urinary schistosomiasis • haematuria • diagnostic reagent strips • indirect diagnosis • Nigeria

INTRODUCTION

Schistosomiasis is of great public health significance in many tropical developing countries and children of school-age are at high risk particularly because in them the disease has its greatest prominence and pathological effects [1, 2]. Although both Schistosoma mansoni and S. haematobium infections exist in Nigeria, the latter is more widespread. Recent reports from several parts of the country lend support to the claim of continued endemicity of S. haematobium in Nigeria [3-5].

Indirect diagnosis of urinary schistosomiasis through the use of chemical reagent strips has been proven highly sensitive and specific in many endemic areas of the world [1, 6]. Many studies in Nigeria have further validated the usefulness and suitability of indirect diagnosis of urinary schistosomiasis especially among school children [7-9].

This study aimed to study the epidemiology of urinary schistosomiasis through haematuria detection among school children in an urban and two rural communities in Ijebu area, southwest Nigeria. It is our hope that this study will elucidate the practicability of indirect diagnosis in urinary schistosomiasis control in the study area.

MATERIALS AND METHODS

Study area: This consisted of Ijebu-Ode in Ijebu-Ode Local Government Area and Okun-Owa and Ijesha-Ijebu in Odogbolu Local Government Area in Ijebu area of Ogun State, southwest Nigeria. The study area lies in the rainforest belt within latitudes 6°30' and 6°40' N, longitudes 3°40' and 3°50' E. Ijebu-Ode is both urban and cosmopolitan, it is the headquarters of Ijebu-Ode Local Government Area and its population consists of civil servants, artisans, traders and farmers. The town has one secondary health centre, many public and private health centres and thirty public primary schools. Okun-Owa and Ijesha-Ijebu are developing rural communities whose inhabitants predominantly engage in subsistence farming. Okun-Owa has three public primary schools, one public secondary school, while Ijesha-Ijebu...
has one public primary school. Each of the last two communities has one public primary health centre and a private clinic.

Potable water supply is infrequent in the three communities. Therefore, the inhabitants usually rely on streams (especially in the rural communities), wells, bore-holes and rain water (in rainy season) for their domestic water needs. Faecal disposal facilities used by the inhabitants of all the communities include water closet, pit latrine (commonest in the rural areas) and open defaecation.

Pre-survey protocols and study subjects: Prior to the commencement of the study, permission was obtained from the local education authority of each of the local government areas. The head teacher and teachers of each selected school were contacted and the parents and pupils were adequately enlightened on the purpose of the study. All the public schools in Okun-Owa, the public primary school in Ijesha-Ijebu and eight randomly-selected public primary schools in Ijebu-Ode were included in the study. The examined population size was 921 (457 males, 464 females) and their age range was 3-18 years.

Questionnaire administration, sample collection and examination: For each participating school child, a questionnaire was administered to obtain information such as age, sex, freshwater contact activities, presence of blood in urine (bloody urine) and toilet facilities. Labelled sterile specimen bottles were used to collect terminal urine samples from the school children between 11.00 and 13.00 hrs from June 2005 to July 2006. Immediately after collection, each sample was observed for visible (gross) haematuria. Subsequently, a diagnostic chemical reagent strip (combi-screen 9) was dipped into each urine sample. The reagent strip was read for mild haematuria by comparing it with the diagnostic colour chart on the bottle of the reagent strip between 60 and 120 seconds.

RESULTS

Out of the 921 school children whose urine samples were tested in the study area 208 (22.6%) had mild haematuria. The recorded prevalence of mild haematuria in the rural areas (26.9%) was statistically similar to that in the urban centre, Ijebu-Ode (16.9%) ($\chi^2 = 2.28$, $P>0.05$). Table 1 summarises the prevalence of mild haematuria in the schools visited in this study. In both the rural areas and the urban centre, there were no significant differences between the prevalences of mild haematuria among the schools ($\chi^2 = 3.16$, $P>0.05$; $\chi^2 = 3.02$, $P>0.05$, respectively).

Figure 1 shows the prevalence of mild haematuria among genders and age groups in the study area. The total prevalence among males (23.9%) was not significantly different from that among females (21.3%) ($\chi^2 = 0.09$, $P>0.05$). The total prevalences among the age groups were statistically similar ($\chi^2 = 0.98$, $P>0.05$).

In the rural communities and the urban centre, 59.2% and 56% of the school children interviewed, respectively reported swimming and bathing in streams and ponds ($\chi^2 = 0.09$, $P>0.05$). 27.6% of the school children in the rural communities fetched water from streams and ponds for drinking and domestic purposes. Among the school children positive for mild haematuria, 17% were swimming and bathing in streams and ponds, 8.5% answered having

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<th>Table 1: Prevalence of mild haematuria among the schools visited in Ijebu division, southwest Nigeria</th>
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<td>Schools</td>
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<td>St Jude’s Pry School, Ijesha-Ijebu</td>
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<td>St Philips’ Pry School, Okun-Owa</td>
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<td>St Barnabas’ Pry School, Okun-Owa</td>
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<td>Moslem Pry School, Okun-Owa</td>
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<td>Multilateral Grammar School, Okun-Owa</td>
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<td>Emmanuel Pry School, Ijebu-Ode</td>
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<td>Joke Taiwo Pry School, Ijebu-Ode</td>
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<td>Moslem Pry School, Ijebu-Ode</td>
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experienced bloody urine, while 10.6% were swimming and bathing in streams and ponds and had experienced bloody urine. 53.2% claimed that they were neither swimming and bathing in streams nor experiencing bloody urine. However, none of the urine samples collected in this study had gross haematuria and 1.5% of those tested in the urban centre tested negative for mild haematuria though they reported previous history of haematuria.

**DISCUSSION**

The presence of mild haematuria among school children in this study indicates *S. haematobium* infection in the positive subjects, according to previously established opinion [1, 6-8]. A recent study by the first author of this paper and his group revealed that some of those with mild haematuria in this study actually had *S. haematobium* in their faecal samples [10]. The recorded prevalence of mild haematuria in this study was high compared to report from another part of Ogun State [4]. This discrepancy may be because the present study included exclusively school children who are known to be more at risk of schistosomiasis than adults [2]. Also, the prevalences of mild haematuria in both the rural areas and the urban centre were higher than the ranges of reported haematuria recorded earlier by some workers [11]. This is expected since diagnostic reagent strips detect not only gross, but also mild, haematuria which normally escape detection by visual urine observation.

The similarity in the prevalence of mild haematuria in the rural areas and the urban centre possibly shows, at least, similar prevalence of *S. haematobium* among school children in the communities. The fact that both genders had similar prevalence of mild haematuria conforms to previous reports that *S. haematobium* infection is not gender-specific in many parts of Nigeria [3, 4]. It also suggests that only *S. haematobium* infection can be implicated for the presence of blood in the urine of the affected children. Occurrence of haematuria in all the tested age groups in this study agrees with the presence of *S. haematobium* in school children of similar ages in Nigeria [3, 12] and elsewhere [13].

The habit of visiting streams and ponds to swim and bathe is generally common among school children in the study area. This is an important factor for consideration for effective control schistosomiasis in the area. This is particularly because infected victims continue to contaminate freshwater bodies with the human schistosome eggs thereby enhancing continual transmission [14]. The seemingly low practice of swimming and bathing among subjects with mild haematuria in this study would have been reinforced by other freshwater contact activities. For instance, water fetching from streams and ponds is common in the rural communities of the study area. In addition, it is common knowledge that children of school-age have an innate flair for frequenting natural freshwater bodies [13, 14]. All these factors would have contributed to the high prevalence of mild haematuria in the study communities.

Effective, sustainable and cost-effective control of schistosomiasis with an in-built rapid, cheap and reliable diagnostic approach has been consistently advocated for adoption in endemic regions [1, 2, 9]. The results of this study show that although some school children were able to self-diagnose urinary schistosomiasis (which is a cheap way to diagnose the disease) many were handicapped mainly because of the hideous nature of mild haematuria which may be indicative of low intensity of *S. haematobium* infection in such children. However, it is important to note that in some endemic communities some children infected with *S. haematobium* may test negative for mild haematuria [15]. A similar observation was recorded in the present study. In view of the foregoing, it is our opinion that reliable diagnosis of urinary schistosomiasis in the study area will require a combination of history of haematuria, visual observation of urine for gross haematuria and testing for mild haematuria using diagnostic reagent strips.

**ACKNOWLEDGEMENTS**

We sincerely thank the local education authorities of Odogbolu and Ijebu-Ode Local Government areas of Ogun State, southwest Nigeria, for their permission to carry out this study. We also appreciate the cooperation of the heads, teachers, parents and children of the schools visited during the study.

**REFERENCES**


