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Prevalence and awareness of urinary schistosomiasis among primary schools children in Alazozab area, Khartoum

Abstract

Background/Aim: Urinary schistosomiasis is prevalent in most regions of Sudan. Urinary schistosomiasis is the second most significant health issue in Sudan, following malaria. This study was carried out to determine the prevalence and awareness among primary school children in the Al Azozab area to study the prevalence and awareness of urinary schistosomiasis among primary school children in Al Azozab and to determine the most common age group with a high prevalence of S. haematobium infection, to measure the prevalence of haematuria among the positive S. haematobium infection cases and to assess the awareness, attitude and practice of school children about schistosomiasis.

Methods: A descriptive study was conducted in the period from 16 September to 11 October 2018 among primary school children aged 9 to 15 years old, males. We examined a total of 220 urine samples and conducted interviews with the children.

Result: The overall prevalence of *S. haematobium* infection was 19.5%. There is a highly significant association between *S. haematobium* infection and the presence of haematuria.

Conclusion: The study showed an epidemiological event: a marked increase in the prevalence of *S. haematobium* infection in the Alazozab area. Regarding the overall results, we conclude that the age group of (12-14) years has the highest prevalence (21%) of infection. There is a highly significant association between *S. haematobium* infection and the presence of haematuria. Despite having substantial knowledge about the disease, people still exhibit incorrect attitudes and practices because they lack understanding of its complications.

Keywords: *S. haematobium,* school children, Alazozab

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Introduction

Schistosomiasis is a waterborne parasitic disease. Digenetic trematode flatworms (flukes) of the genus Schistosoma[1] cause the disease.

Schistosomiasis is one of WHO's most neglected diseases. It is a major tropical and subtropical disease commonly found spread in many African countries and other developing countries in Asia and South America. Schistosomiasis is the most prevalent parasitic disease after malaria in terms of socioeconomic and public health importance in the developing world. Schistosomiasis affects almost 240 million people worldwide and well over 700 million of them live in endemic areas.[1]

Schistosomiasis is prevalent in tropical and subtropical areas, especially in poor communities without access to safe drinking water and adequate sanitation. It is estimated that at least 90% of those requiring treatment for schistosomiasis live in Africa.[2]

Nowadays schistosomiasis is prevalent in all states of Sudan, and it has increased in distribution and prevalence as a result of progressive expansion in water resource development and population movement. Children who live close to water resources are more prone to being infected due to their lack of awareness. Morbidity is also increasing due to various clinical presentations and complications; therefore, this study is primarily designed to measure the prevalence and awareness of urinary schistosomiasis among primary school children in the Alazozab area. Despite the availability of a potent drug, praziquantel, the control of the disease as a public health problem remains a challenge. Schistosomiasis leads to considerable morbidity and mortality. Among the world's serious parasitic diseases, schistosomiasis ranks second only to malaria in the number of people infected and the extent of the areas where the disease is endemic.

Methodology and material

Study design

This study is a non-interventional descriptive cross-sectional study that focusses on schools.

Study area

The study took place in Alazozab town, Khartoum, as well as Khartoum State, SUDAN. This area is restricted by Abu Adam from the south, Wad Ageeb from the west, Alamria town from the east, and Alshijara Street from the north; it is close to Bhar Abid.

Study population

The study focused on male children attending primary schools in the Alazozab area.

There were three schools: Wd Ageeb Primary School, which had 217 students; Alazozab Primary School, which had 316 students; and Aldbasin, which had 152 students.

Inclusion criteria

Male children in governmental primary schools in Alazozab

6th -to-8th grade

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Exclusion criteria

Females

Below 6th grade

Sample collection methods

Tools for data collection & techniques

The tools used for collecting samples included an interview questionnaire and containers specifically designed for urine sample collection.

Analysis tools

Statistical analysis done by the statistical package of social services (SPSS)

Microscope for urine analysis

Ethical clearance

We obtained permission from the Khartoum educational locality and the directors of the schools where we conducted the study.

We took the permission of the participants and their parents.

To inform the infected participants, we assigned each student a unique number that matched the numbers labelled in each container.

This study posed no physical risk to participants during the 5-minute interview. No study material used the participant's name or his institution. We obtained informed consent from the children and their parents/guardians. All the information obtained from each study participant was kept confidential. The local health center informed and treated all the infected children and their families.

Results

Researchers randomly collected a total of 220 urine samples from 220 males aged 9–15 years at 3 primary schools (Wd Ageeb, Alazozab, and Aldbasin) in the Alazozab area of Khartoum, Sudan. We conducted the collection and diagnosis. 43 were found positive for *S. haematobium*; this number constituted a 19.5% prevalence rate.

Table 1 shows the distribution of *S. haematobium* infection by age group and haematuria status. The highest infection rate occurred in the 12-14 years age group (21.3%, 32/150). All positive cases showed microhaematuria (100%, 43/43), while macrohaematuria was observed in 6.9% (3/43) of infected children. Statistical analysis revealed highly significant associations between infection status and both macrohaematuria ($p<0.001$) and microhaematuria ($p<0.001$). (Figures 1–3)

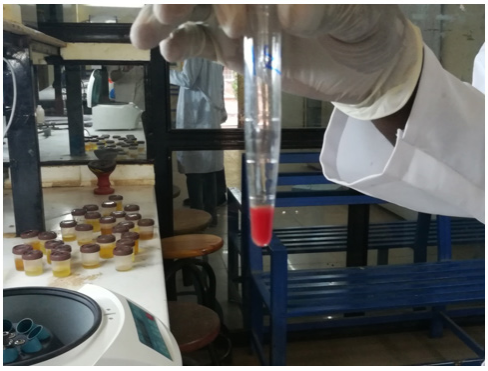

Figure 1 Macroscopic heamaturia detected among the infected school children in Alazozab area September 2018.

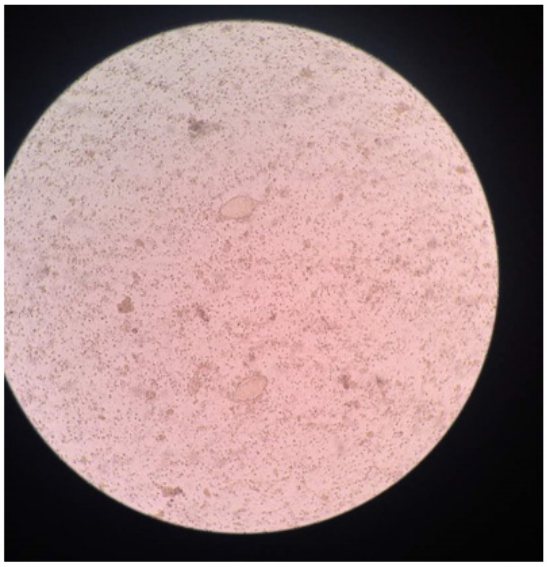

Figure 2 Microscopic view of urine sample with both *S. heamtobium* and *S. mansoni* ova detected among the infected school children in Alazozab area September 2018.

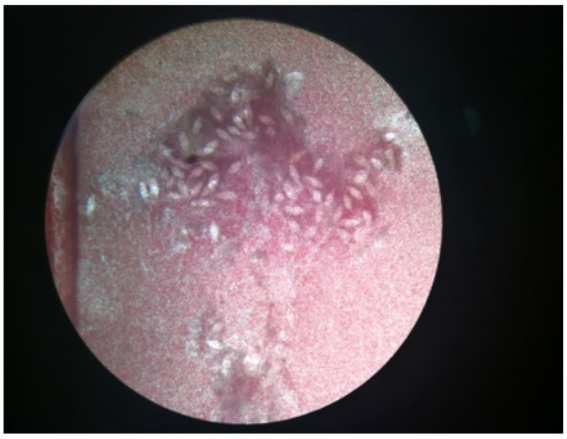

Figure 3 Microscopic view of urine sample with high intensity of infection (50 ova) detected among the infected school children in Alazozab area September 2018.

Table 1 Prevalence of *S. haematobium* infection by age group and haematuria status among primary school children in Alazozab, Khartoum (2018)

Characteristics	Positive	Negative	Total	p-value
Age group				
9-11	7	38	45	
12-14	32	118	150	
15 or more	4	21	25	
Macrohaematuria				
Positive	3	0	3	**<0.001**
Negative	40	177	217	
Microhaematuria				
Positive	43	0	43	**<0.001**
Negative	0	177	177	

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Discussion

Previous studies done by the Ministry of Health in Sudan have suggested that the infection with *Schistosoma haematobium* in Khartoum state in general and in the Bahar Abiad area particularly has markedly increased during the last years.

Our study in the Alazozab area showed a marked increase in the overall prevalence of *S. haematobium* infection up to 19.5%. The study area is near the river, and the snail control program failed. Furthermore, the lack of health education, inadequate sanitation, delayed diagnosis, and treatment might also contribute to this increase in prevalence.

The study findings were similar to the study done in Nigeria[3] that showed a significant association between age and infection. The previous study done in Nigeria showed the high infection cases in the older (10-14 years) showed the high prevalence (69.9%), similar to our study, which showed the highest prevalence between the ages of 12 and 14 years, which was 21%, while the older age (more than 15) showed the least prevalence (16%). We suggest that older students have a greater awareness of the disease's dangers, which prevents them from consuming water resources.[4]

Our study revealed a correlation between the prevalence of haematuria and *S. haematobium* infection. The macroscopic examination of haematuria showed a percentage of 6.9% among Schistosoma-infected patients, while the microhaematuria detected by microscope found 100% of the cases, in comparison to a study done in Al-lamab Bhar Abiad,[5] which showed The macroscopic examination of haematuria showed a percentage (77.8%) among schistosoma-infected patients, while the microhaematuria detected by a microscope found (97%) of the cases.

This variation may be due to the difference in the intensity of infection between the previous study and our study; it can also be due to the late diagnosis and treatment of the patients.

Furthermore, the prevalence in the Al-lamab Bhar Abid study,[5] which was done in 2018, showed the prevalence to be 24%, which is close to what our study showed, as the prevalence was 19.5%. This supports the idea that the Bhar Abid areas are a big source of schistosomiasis.

Our study indicated that most children are well aware of schistosomiasis symptoms, modes of transmission and ways of prevention, but despite that, there is a wrong attitude and practice, as the majority of them go swimming and urinate in water collection areas, in comparison to the study which was done in River Nile State,[4] Sudan, which indicated that the higher prevalence and intensity of infection were more among the students who are conscious of the disease. This may be due to the fact that most of them don't recognize the risks and complications of schistosomiasis.

Conclusion

Our study showed an epidemiological event: a marked increase in the prevalence of *S. haematobium* infection (19.5%) in the Alazozab area.

Regarding the overall results, we conclude that:

(i) The age group of 12-14 years has the highest prevalence (21%) of infection.

(ii) There is a highly significant association between *S. haematobium* infection and the presence of haematuria among positive samples (100%).

Despite having good knowledge about the disease, people still exhibit incorrect attitudes and practices because they lack understanding of the associated risks and complications.

Recommendation

According to our study results, we recommend prompt intervention by applying proper prevention and control measures, which include:

(i) Health education focuses on the risks and complications, as well as community participation.

(ii) Safe water supply, sanitation, and use of latrines.

(iii) Targeted chemotherapy for infected schoolchildren.

(iv) Drying and draining the canal.

(v) Clearing canals of weeds and vegetation.

(vi) Applying molluscicides and introducing animal predators that consume snails.

(vii) Doing an interventional study in this area

(viii) Create new laws that prevent children from swimming or urinating in water.

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None.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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