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Original Research Article

Prevalence of Schistosoma Haematobium Infection in Alsyal Village, River Nile State, Sudan

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Abstract: ***Background:*** Schistosomiasis is a debilitating disease, infects millions of people in tropical and subtropical regions. Objectives: This study assessed the situation of the urinary schistosomiasis among the people of the Alsyal village, River Nile State, Sudan. ***Methods:*** A cross-sectional survey was carried out in 2016, in the Alsyal village, and 220 samples of urine were collected and processed using the centrifugation/sedimentation technique. ***Results:*** The overall prevalence and intensity of the disease among the pupils studied were 4.1% and 95.9 eggs/10ml urine, respectively. The prevalence of infection among male pupils was 77.8%, and for females was 22.2%, while the intensity among males was 64.9eggs/10ml and for females was 35.1 eggs/10ml urine. The highest infection rate (71.4%) was reported among the 12- 24 years age group, while the infection was (14.3%) among less than 12 years and more than 24 years age group. ***Conclusion:*** Findings show the need for an integrated control program against urinary schistosomiasis including the treatment of all infected the people and the implementation of a health education program.

Keywords: Schistosoma hematobium, Prevalence, Shendi, River Nile State, Sudan**.**

INTRODUCTION

Schistosomiasis is one of WHO 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 with estimated deaths of more than 200,000 annually [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]. Schistosomiasis is a widespread parasitic infection caused by blood flukes of the genus Schistosoma and transmitted by specific freshwater snails. The infection is reported to have plagued the humans since the ancient times [3]. Some of the factors which influence the transmission of schistosomiasis in an endemic area include the presence of snail intermediate hosts of the parasites and human contact with the infected waters. Out of the three main human infecting species of Schistosoma (*S. haematobium*, *S. mansoni* and *S. japonicum*), *S. haematobium* is the predominant species in Africa being endemic in about 53 countries in Africa and the Middle East [4, 5]. Urinary schistosomiasis caused by *S. haematobium* is noted to be more prevalent in Nigeria than intestinal schistosomiasis due to the wider distribution of its snail host Bulinus species [6]. This is in addition to indiscriminate passing of urine containing *S. haematobium* eggs into water supplies containing the snail host [7].

The disease has two clinical forms, urinary and intestinal schistosomiasis, caused by Schistosoma haematobium for the former and *S. mansoni*, S. intercalatum and *S. japonicum* for the later [8]. Schistosomiasis occurs when the individual's skin contacts fresh water which is contaminated by Schistosoma eggs as Schistosoma parasites can penetrate the skin. In Sudan, the disease existence returns to 2600 BC, and became most prevalent with the

expansion of irrigated agriculture [9]. Moreover, interaction with neighboring African countries and the continuous population movement across the boarders from areas that have high disease burden had led to the increase of transmission and endemicity of the disease. The first infection of *S. haematobium* was reported by Balfour, among school children in Khartoum in the early twentieth century. Since then, the disease was reported from different parts all over the country, including the Northern State, Kordofan, Darfur, Gadaref, Kassala, White Nile, Gezira and Wadi Halfa, and even in several parts of Khartoum, Moreover, the distribution and prevalence of the two types of schistosomiasis are still increasing due to the increased development of water resource and the interaction of population during different life activities. In this study we aimed to investigate the prevalence of *S. haematobium* infection in Alsyal village, River Nile State, Sudan.

MATERIAL AND METHODS

The Study Area

The study was conducted from March to May (2016), in the west of Shendi, Alsyal village, River Nile State, Sudan.

Sample Collection and Examination

Two hundred and twenty urine samples were collected between 10am and 2pm and consisted of the terminal urine (last drops) of at least 10 ml. A questionnaire was designed to collect data related to human behavior.

Methods

Urine Examination.

Macroscopical Examination

The color of urine was examined for the presence or absence of blood (haematouria) and turbidity (proteinuria).

Microscopical Examination

About 10ml of urine were transferred to a centrifuge tube after mixing, and then centrifuged at 2000 rpm for 3 minutes. Using Pasteur pipette, the supernatant was discarded from each tube and all sediment was transferred to a clean slide and covered with cover glass. The preparation was examined microscopically using 10x and 40x objectives for Schistosoma haematobium eggs.

Data Analysis

The obtained data were presented as means ± S.D. Statistical analysis for all the assays obtained data carried out using Microsoft Excel Program 2010.

RESULTS AND DISCUSSION

Schistosomiasis or bilharzias is a tropical disease caused by blood dwelling fluke worms of genus Schistosoma. The transmission cycle requires contamination of surface water by excreta, specific freshwater snails as intermediate hosts.

Parasitological Examination

Out of 220 urine sample examined, 9 were found positive for Schistosoma haematobium infection as shown in Figure 1. This constituted over all prevalence rate of 4.1% (Table 1). This result is disagreeing with Hassan 2009, who found that higher prevalence rate (21.5%) in assalaya campus (White Nile). This result agree with Hilali and El- Katsha *et al.*, who found that the transmission of the disease was related to intensive contamination of water bodies with human organic matter waste, bad sanitation of water bodies, such as requirement of ablution, like washing the anals or urethral orifices after urination and defecation. Many other factors were found to contribute to the transmission of the disease among them were a family occupation and sources of drinking water and the poor people are more susceptible to disease.

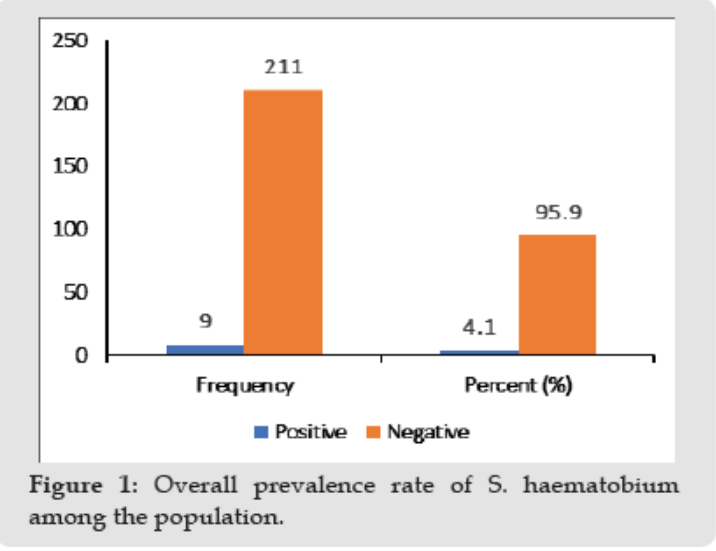

Figure 1: Overall prevalence rate of S. haematobium among the population.

Table 1: The overall prevalence rate of S. haematobium among the population in Alsyal village

All Sample	Frequency	Percent (%)
Positive	9	4.1
Negative	211	95.9
Total	220	100

Table 2: The prevalence rate of S. haematobium among the population in Alsyal village according to Gender.

Sex	Number examined	Frequency	Percent (%)
Male	144	7	77.8
Female	76	2	22.2 (0.14 P-value)
Total	220	9	100

Positive cases of Schistosoma haematobium were detected; the results revealed that the prevalence in males was higher than that of females (77.8% and 22.2% respectively. Figure 2 Show that out of 144 males in the age of less than 12years, only one positive case was reported (14.3%), while 5 cases in the age 12-24 years (71.4%) and one case in age of more than 24 years (14.3%) within the 7 positive cases as illustrated in Table 3. Although 40.3% of the study populations have a direct contact with water, the prevalence rate was low, and this may be due to absence of infected snails. Also 28 of children (12.7%) showed a history of previous infection, but only 5 cases were re-infected again (17.9%) as shown in Tables 4 & 5. Out of 220 children examined, 43 were showed UTI infection and 177 without UTI infection as demonstrated in (Table 6). Only 4 positive cases were detected within swimmer group and 3 were detected in non-swimmers group as shown in Table 7.

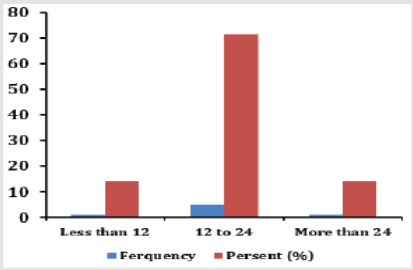

Figure 2: Prevalence rate of S. haematobium according to age groups.

Table 3: The prevalence rate of S. haematobium among the male population in Alsyal village according to age groups.

Age groups	Frequency	Present (%)
Less than 12	1	14.3
12-24	5	71.4
More than 24	1	14.3
Total	7	100

Table 4: The frequency of population in Alsyal village according to previous infection..

Infection	Frequency	Percent (%)
Yes	28	12.7
No	192	87.3
Total	220	100

Table 5: Show prevalence rate of positive and negative case with previous infection.

Infection	Frequency	Percent (%)
Positive	5	17.9 (0.00 P-value)
Negative	23	82.1
Total	28	100

Table 6: Show prevalence rate of UTI.

Infection	Frequency	Percent (%)
Yes	43	12.7
No	177	80.5
Total	220	100

Table 7: Show prevalence rate of Swimmers in males.

Swimmers	Number examined	Positive
Yes	58 (40.3)	4 (6.9) (0.79 P-value)
No	86 (49.7)	3 (3.5)
Total	144	7

The endemic areas are always characterized by irrigation systems and man-made reservoirs that lead to the spread of the infection. The extensive use of human feces for fertilization of gardens and fields crops may greatly increases the chances of infecting the snails. The distribution of infection across populations of rural and suburban areas is strongly associated with the human water contact patterns, snail populations and mercurial density. Disease patterns associated with gender are variable, considering behavioral, professional and cultural factors. The rate of infection among males (77.8%) was less than among females (22.2%). Woolhouse *et al.*, concluded that the age and gender factors are related to the frequency and behavior of water contacts. Most reports showed that males are more susceptible than females due to their attitude towards water contact. These findings disagree with the present study in which schistosomiasis prevalence and intensity are higher in females than in males. These differences could be as a result of environmental hygiene condition that might exist among the study areas. However, On the contrary, studies carried out in Ghana and Nigeria showed similar results of higher prevalence of urinary schistosomiasis among females compared with males.

CONCLUSION

The prevalence of schistosoma haematobium in Alsyal area seems to be low but that not mean no presence of schistosomasis. Males are more exposed to infection than females which may be due to their activities near water.

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