

ASSESSMENT OF *SCHISTOSOMA HAEMATOBIIUM* PREVALENCE AMONG PUPILS IN UM HANI VILLAGE AT KOSTI LOCALITY ,WHITE NILE STATE (SUDAN) 2011-2012.



Original Research Article

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ABSTRACT

This is a cross-sectional study conducted in Kosti Locality rural area - White Nile State, Sudan during the period of (June 2011- June 2012). Study aimed to determine the prevalence of *Schistosoma haematobium* among pupils, identify the most affected age group, and determine the effect of knowledge on prevalence and to assess the playing and swimming at the canal as risk factor influencing the spread of the disease. At two basic schools pupils were examined using urine reagent strip. A total of 200 pupils were interviewed using questionnaire to assess risk factors related to *Schistosomiasis*. The prevalence of infection was found significantly higher among boys compared to girls ($P \leq 0.05$), No significantly different between age groups ($P \geq 0.05$) and No significantly different according to the knowledge of respondents about *Schistosoma haematobium* ($P \geq 0.05$). The study concluded that the prevalence of the diseases in area was 18.4%, and it was especially high among male in the school age and the study recommended extensive health education program and provision of sanitation facilities in the area.

Keywords:

Schistosoma haematobium,
 school children,
 White Nile State, Sudan.

I. BACKGROUND

Schistosomiasis refers to human disease resulting from infection by any of the parasitic blood flukes of *Schistosoma* spp. Worldwide, it is estimated that over 239 million people are acutely or chronically infected with one or more of these species (1,2). The term human schistosomiasis includes a complex group of acute and chronic parasitic infections caused by mammalian water borne blood flukes *Schistosoma* (3,4,5). The disease is a snail-borne parasitic disease caused by trematodes of the genus *Schistosoma*, with six species including *S. haematobium*, *S. japonicum*, *S. mansoni*, *S. intercalatum*, *S. mekongi* and *S. malayensis*. Also is a snail-borne parasitic disease caused by trematode of genus *Schistosoma* (6). Between 500 – 600 million of people were considered at risk of becoming infected with Schistosomiasis (7). An estimated 779 million are at risk of Schistosomiasis, of whom 106 million (13.6%) live in irrigation schemes or in close proximity to large dam reservoirs (8). However, School- age children in endemic areas were the primary target of preventive chemotherapy intervention because of the risk of their recent exposure to infection and consequently the early stage of their chronic lesions, also treatment during childhood therefore prevents chronic morbidity in later years (9).

Globally, schistosomiasis ranks second among parasitic disease of socio-economic and public health importance mainly in 48 African countries (8).

Of the 200 million cases of Schistosomiasis world-wide, most are caused by *S. haematobium* in sub-Saharan Africa (11,12). Schistosomiasis and Soil Transmitted Helminthes are widespread in sub-Saharan Africa particularly affecting people with poor water hygiene and sanitary facilities; the highest infection and disease burdens are generally found among school age children (13).

Schistosomiasis is the most prevalent parasitic disease in Sudan, with twenty four million people at risk, 5 million cases of infection and a prevalence rate of 20% (14). In the East of the country, there are few foci of transmission in the zone of Chasm El Girba, in the West, some foci are found in the Jebel Mara Mountains, along the White Nile, the mean prevalence in Gezira 15.5%, Khartoum 17.5 %, White Nile 24% (15).

The prevalence rises rapidly from the age when young children begin to wander a field. The peak prevalence and intensity of infection occur in children aged (10-14 years) (4,5) and may approach 100% (16, 17, 18) reach the peak in the age of 15-20 years (19, 20). School-age children who live in areas with poor sanitation were also at risk because they tend to spend time swimming in water containing infectious cercariae (21). Urinary schistosomiasis was significantly associated with the frequencies of contaminated water contact, taking baths, swimming, and wade the stream (22). Taking sanitation measures to prevent contamination of water sources by human excreta are critical (10, 19, 23) during farming, fishing, washing and bathing. Also significantly higher prevalence was reported among males compared to females (24). The prevalence of *S. haematobium* as determined by filtration, interview and reagent strip methods was 21.4%, 22.15% and 30.9% respectively (25) among who did not have information about the disease (26, 27).

II. MATERIAL AND METHODS

Study Population: This is cross- sectional descriptive community- based study conducted in White Nile State to estimate the prevalence of *Schistosoma haematobium* among basic school children.

Study area: The study conducted in Umm Hani area in White Nile state of Sudan, the area has latitude of 13.053° N and longitude of 32.715° E. The annual rainfall was estimated to be 600 mm, the annual mean temperature 22.5 degree centigrade in winter and 34.5 degree centigrade in summer and the annual relative humidity 55 percent.

Sample size: 200 were selected using the formula: $n = z^2 \cdot pq / d^2$

Where: n = Sample Size, z = the value of the standard normal variable corresponding to is 95% level of significance (1.96), p = Expected prevalence (15 %), q = 1 – P (0.85), d = marginal error (0.05)

$$\frac{(1.96)^2 \cdot (0.15)(0.85)}{(0.05)^2} = 195.9 = 196$$

Sampling technique: Proportional sampling was done based on the number of students in each class of the six classes. 107 boys and 93 girls were nominated and interviewed using a predesigned questionnaire, from each a 10 ml sample of terminal urine was collected in a labeled clean specimen container between 10:00AM and 14:00PM according to WHO guideline; the collected samples were tested for heamaturia, using a reagent strip within approximately 10 minutes.

The completed questionnaires were verified and checked prior to analysis for completeness and accuracy. Data was entered into Statistical Package for Social Sciences SPSS version (16.0). The relationships between variables were examined using the chi- square test.

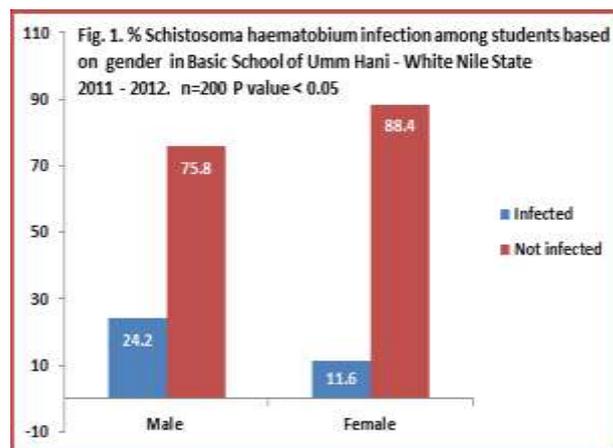
III. ETHICS STATEMENT

The study proposal received ethical approval from the Ministry of Health and Ministry of Education, then administration of the schools in the study areas after getting the consents from their parent and school administration Kosti Locality- White Nile State.

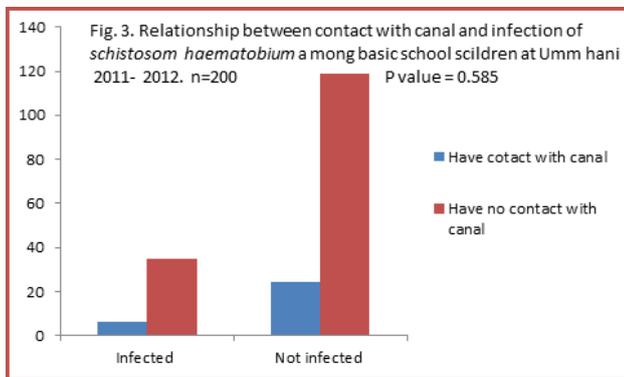
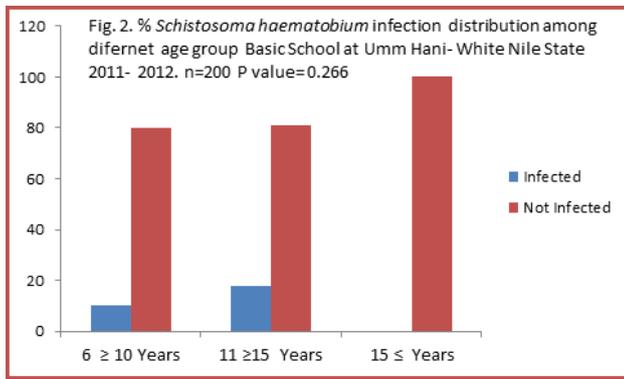
IV. RESULTS

The result of (200) pupils examined showed that the prevalence of *schistosoma haematobium* among male was 24.2% while it was 11.6% among females using urine stripe technique (p = 0.027).

The Prevalence *schistosoma haematobium* among age group of 10 to 15 years was 17.9%, while it was 10.4% among age group of 6 to 10 years with P value of 0.266



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V. DISCUSSION

Schistosomiasis is the most prevalent parasitic disease in Sudan, with twenty four million people at risk, 5 million cases of infection and prevalence rate of 20% (14). So according to previous reports on *S. haematobium* the overall prevalence of infection in the White Nile State was found to be 12- 46% (10).

This study showed that the prevalence of infection was higher among boys than girls. In study done in White Nile State, Sudan (22) reported the highest prevalence of *S. haematobium* was among boys than girls. Also (30) found that boys have significantly higher intensity of *S. haematobium* infection than girls. However, in some endemic areas, the rate of infection was lower in females than in males (18, 31) said the males were recorded higher prevalence rate than females. This was attributed to the greater exposure of males to the parasite because of their water contact activities like fishing, swimming and farming in irrigation schemes (32). But other studies (30, 31, 32) showed that there was no significant difference in the prevalence of *S. haematobium* infection between boys and girls.

There was no significant difference in the prevalence of schistosomiasis between age group and this confirming the previous work in the White Nile State, Sudan (22) that the rate of infection was not different between groups by age. This may be an indication that all age groups equally exposed to infection through water contact (7,20) as a result of a low level of resistance and intensive water contact when playing and swimming (13, 20). However, other studies (4,24,5,18) revealed that the peak prevalence and intensity of infection occur in children aged (10-14) years. So, the infection increases in prevalence and intensity with age, peaking in the age group 15- 20 years (19). And the Children of < 10 years of age had a significantly higher rate of prevalence of *S. haematobium* infection than those children ≥ 10 years of age (30).

Questionnaire analysis, the previous study showed, the Infection was significantly higher among pupils who did not have information about the disease (26,27).

According to result obtained, in previous studies it was confirmed that schistosomiasis infection was higher among pupils who have frequent contact with open water source (26, 27) so, those pupils who had a habit for swimming at a higher risk to be infected with *S. haematobium* (8); since there was a significant association between having current schistosomiasis infection and participating in swimming and bathing in snails harbouring water (32, 33).

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