Prevalence of Schistosoma Haematobium among pupils_ El-tawella village Kosti-White Nile State- Sudan (2012)

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ABSTRACT

This is a cross-sectional community-based study conducted in El-tawella rural area of White Nile State in Sudan during the period of June - September 2012. The aims of the study were to determine the prevalence of *Schistosoma haematobium* among School age children (aged 5-14 years) and to identify the most affected age group. 182 children were selected randomly in two basic schools and investigated for the presence of the parasites and interviewed for frequency and possibility of their contact with contaminated water sources. The prevalence of the diseases among pupils was found 13.2% with statistical significant association with contaminated water contact. The study concluded that the cases of *Schistosoma haematobium* among School age children in the area are associated with children contact with contaminated water and recommended extensive school health education program, management of positive cases, and in collaboration with local authority to put in place restrictions for children to access those contaminated water sources.

Keywords:

Schistosoma haematobium,
school children,
White Nile State, Sudan

I. INTRODUCTION

Schistosomiasis is an acute and chronic disease caused by blood flukes (trematodes worms) of the genus Schistosoma [1]. The term human schistosomiasis includes a complex group of acute and chronic parasitic infections caused by mammalian water borne blood flukes Schistosoma [2, 3, and 4]. The disease is a snail-borne parasitic disease caused by trematodes of the genus Schistosoma, with six species including *Schistosoma haematobium, Schistosoma japonicum*, *Schistosoma mansoni*, *Schistosoma intercalatum, Schistosoma mekongi* and *Schistosoma malayensis*[5].

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 [6] Also the disease it is a snail-borne parasitic disease caused by trematodes of genus Schistosoma[5].Between 500 and 600 million people were considered at risk of becoming infected [7].An estimated of 779 million are at risk of Schistosomiasis, of whom 106 million (13.6%) live in irrigation schemes or in close proximity of large dam reservoirs [8]. However, School- age children (aged 5-14 years) in endemic.

Areas were the primary target of preventive chemotherapy intervention because are at highest risk of infection to 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 and is found in 48 countries of Africa [10].

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 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 the Gezira 15.5%, Khartoum 17.5 %, and White Nile 24%[15].

The prevalence rises rapidly from the age when young children begin to wander field. The peak prevalence and intensity of infection occur in children aged (10-14) years [16, 17]. The prevalence in this group may approach 100% [18, 19, and 20] and the prevalence rise with increased age, the infection reach it is peak at the age of 15- 20 years [21]. Children aged between 10 and 15 years are the most heavily infected [12, 7,22] and then decline [22]. School-age children who live in areas with poor sanitation are often most at risk because they tend to spend time swimming or bathing in water containing infectious cercariae [23]. Urinary schistosomiasis was significantly associated with the frequencies of contaminated water contact, taking baths, swimming, and wading the last stream [24] Sanitation measures to prevent human excreta from contaminating local water sources [21, 25, 27] due to exposure occasioned by washing, bathing, dry season farming and fishing activities, significantly higher prevalence in males compared to the females and sever infection to age group between 13- 15 years[28] The prevalence of *S.haematobium* as determined by filtration, interview and reagent strip methods was 21.4%, 22.15% and 30.9% respectively [29]. Infection was higher significantly among students who did not have information about the disease [30, 31].

II. MATERIAL AND METHODS

Population:

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

Study area

El-Tawella has latitude of 13.276° N and longitude 32.603° E. The annual rainfall was 600 mm, the annual mean temperature 22.5 degree centigrade in winter and 34.5 degree centigrade in summer and the annual relative humidity of 55%.

Sample size

Sample size was calculated as 196, the primary sampling unit was the pupils of basic school using the following formula
n = z2. pq /d2

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)

$$196 = \frac{(1.96)2.(0.15)(0.85)}{(0.05) * (0.05)}$$

Sampling technique:

To determine the number of boys and those of girls in each school from the total pupils per area (196) the following formula was used.
ns = n . ws/N

Where:

ns = Sample Size in each school.
n = total sample size.
ws = number of pupils in each school.
N = number of total pupils in the two schools.

However, the distribution of the sample size (107) for boys and (93) for girls, among classes (six classes) was using the following formula. nc = ns . wc /N

Where:
nc = sample size in each class .
ns = sample size in each school .
wc = number of pupils in each class .
N = number of pupils in each school.
The pupils were selected using systematic random sample in each class.

Field work:

The school survey was conducted during the period of June to September 2012, 196 pupils were selected randomly interviewed using predesigned questionnaire.

From each subject (196), a 10 ml sample of terminal urine was collected in a labeled clean specimen container from each student; the samples were collected between 10h: 00 and 14h: 00 according to WHO guidelines. Collected samples were tested for heamaturia, using a reagent strip within approximately 10 minutes. (97) For boys and (85) for girls were analyzed. 14 samples were rejected.

Data verification and statistical analysis:

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).

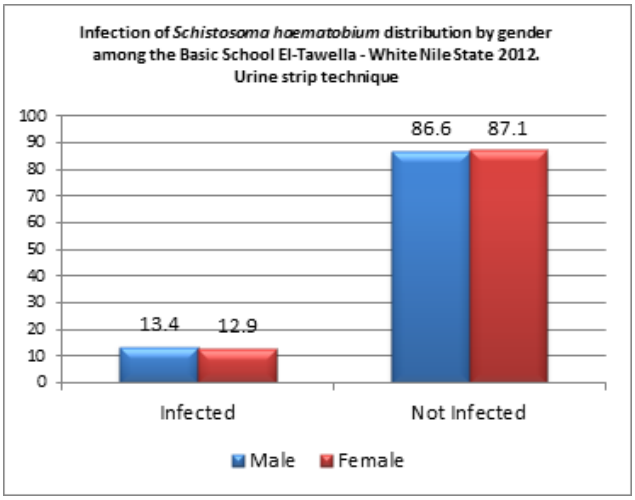
The relationship between the variable was examined using the chi- square test. Values were considered to be statistically significant when the p value is <0.05.

Ethics Statement:

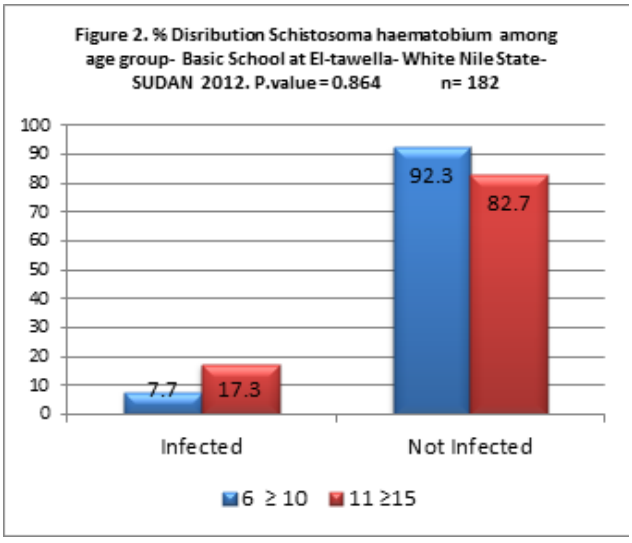
The study proposal received ethical approval from the Ministry of Health and Ministry of Education, then administration of the schools in the study areas, Kosti Locality- White Nile State, Sudan.

III. RESULTS

Figure 1.



The Prevalence *schistosoma haematobium* in each age group among the pupils, the survey showed that age group (11 ≥ 15) was higher infected (17.3%) than (5 ≥ 10) 7.7% urine stripe technique (p = 0.864).



IV. DISCUSSION

Schistosomiasis is the major prevalent parasitic disease in Sudan, with twenty four million people at risk, 5million cases of infection and prevalence rate of 20% was reported [29]. The prevalence of infection in the White Nile State was found to be 12- 46% [31].

Our results showed that the prevalence of infection was not different among sex, the infection among males were 13.4 % and Females 12.9% using urine stripe technique (p = 0.937). In study done in White Nile State, Sudan [18] it was reported that the highest prevalence of *S. haematobium* was among boys than girls. Also [3] 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 males [11][17] said that 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 [12]. But other studies [13] [9] [3] showed that there was no significant difference in the prevalence of *S. haematobium* infection between boys and girls.

There was no statistical significant among age group. (11 ≥ 15) age was slightly higher (17.3%) than (5 ≥) age (17.7%). So the prevalence of schistosomiasis between age group is in contrast with previous studies, also it was reported that the cchildren of <10 years of age had a significantly higher rate of prevalence of *S. haematobium* infection than the children ≥ 10 years of age [3]. This study showed that the rate of infection was not different between groups of age. This is an indication all age groups were equally exposed to infection through water contact [9] complicated with low level of resistance and intensive water contact [22] [26]. However, other studies ([10] [7] [21] [11] revealed that the peak prevalence and intensity of infection occur in children aged (10- 14) years and it was noted that the infection increases in prevalence and intensity with age, peaking in the age group 15- 20 years [24].

V. CONCLUSION

The study concluded that the prevalence of Schistosoma haematobium is high among students and there was no different among male and female group, while contact with contaminated water remain the majors risk factors associated with the prevalence.

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