Original Articles

Prevalence of *Schistosomia haematobium* and Associated Risk Factors Among School Children in Algablin village, White Nile State, Sudan.

[1]Hafiz.Y. Mohammed, [1]Abd-Elmunem. M .Magboul, [1] Mohammed .A. Suliman. [2] Hadeel .Y. Mohammed.

[1] Assistant Professor University El Imam El Mahdi, Faculty Medical laboratory Sciences, Department of Medical Parasitology and Entomology. Sudan

[2] Medical laboratory technologist, Kosti Teaching Hospital, White Nile State, Sudan.

Corresponding author: *Hafiz Yahya Mohammed**:** Department of Medical Parasitology and Entomology, Faculty of Medical Laboratory Sciences, University of El Imam El Mahdi, Kosti city, Sudan. Tel. 0912362869- 0125202488, e-mail hafizyahya62@yahoo.com .*

Abstract

Background: Schistosomiasis is a water parasitic disease infecting more than 200 million people, it is the third after malaria and intestinal helminthiasis in global parasitism. The negative impacts on school performance and the debilitation caused by untreated infections demoralize both social and economic development in endemic areas.

Aim: To determine the prevalence of urinary schistosomiasis among basic school children in Algablin village.

Methods: This cross sectional study was carried out from May to July 2018 in Algablin village, White Nile State. Sudan, . Two hundred urine samples were collected from school children in Algablin village and examined for the parasite using parasitological filtration concentration techniques.

Results: Out of 200 urine samples examined, the prevalence of *S.haematobium* was 24%. In Abo Bakr Alsedig School the prevalence of urinary schistosomiasis was 25% and in Khalid Ibn Al Walid school the prevalence of infection was 23%. Regarding to the age groups, in the group (8-10) years, the prevalence of the disease was 26%, and in age (10-13) years the prevalence of infection was 22%.

Conclusions: The study concluded that the prevalence of *S.haematobium* parasite infection is 24% in the studied area, and that the prevalence of urinary schistosomiasis was higher in age group 8-10 years than age group 11-13years.

Keywords: Prevalence; Schistosomiasis; *S.haematobium*. risk factors; Filtration Technique.

Introduction:

Schistosomiasis (Bilharzia) known as snail fever, it is water born parasitic disease caused by Schistosoma[1], it is the digenic treamatode found in the blood vessels of man. The negative impacts of the disease on school performance and the debilitation caused by untreated infections demoralize both social and economic development in endemic areas.[2] Most common infections are caused by *S. haematobium, S. mansoni, and S. japonicum,* less prevalent species include *S. mekeongi* and *S. intercalatum.* Schistosomiasis is endemic in tropical and subtropical areas it is the major cause of morbidity and mortality; estimates of infected individuals worldwide are 237 million and another 600–779 are at risk of being infected.[3] Urogenital schistosomiasis, caused by *S. haematobium*, is characterized by hematuria, dysuria, bladder wall pathology, hydronephrosis, and it can also lead to squamous cell carcinoma.[2,4] In adults, the infection can cause genital ulcers and other lesions [5], Resulting in poor reproductive health, with sexual dysfunction and infertility [6] 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.[7,8] Studies also suggest that HIV/AIDS is highly prevalent in the areas of parasitic worm infections, such as schistosomiasis.[9-12]

Since the sources of water supplies in majority of rural areas in White Nile State

are canals, few latrines, and lack of fresh water; Contaminated water is use for washing clothes, agricultural purposes, fishing and swimming leading to increased rate of schistosomiasis.[13-15] therefore, the present study was aimed to measure the prevalence of urinary schistosomiasis among school children according to the age groups.

Materials and Methods:

Study design:

This cross-sectional descriptive study was conducted in White Nile State, Algablin village, Sudan during May to July 2018. Two schools were selected, Abo Bakr Alsedig (far away from the river) and Khalid Ibn Al Walid (nearby). The main character of the area is location near to the river.

Study population

A total 1500 School children aged from 9-13 years, just male in the two schools were chosen for the study. To select the study subjects, the students were first classified according to their educational level (grade 2 to 5 basic school) and they were taken from each class category by random sampling

Inclusion and Exclusion criteria

School children different ages were included in the study.

Children who received treatment of parasitic infections during the last two weeks before the study were excluded.

Sample size:

A total of 200 urine samples were collected from the participants by systemic random sampling technique.

Ethical consideration:

The study proposal received ethical approval from the Ministry of Health and Ministry of Education, then administrations of the schools. Study aims were well explained to both schoolchildren and their parents.

Samples Collection:

Before samples were collected, children were given guidance on how to collect the sample and amount of urine needed. They were also guided not to contaminate urine with water and wash their hands afterwards. The study subjects were provided with sterile plastic, dry and clean well labeled screw capped containers and instructed to include the terminal urine needed. Then, the samples were transferred to the parasitology laboratory in University of El Imam El Mahdi for parasitological examinations.

Examination of samples:

The urine samples were examined by urine strips, centrifugation sedimentation, and filtration technique.

Examination of urine by strips:

A reagent AMP urine strip was carefully dipped into the sterile bottle containing the urine for 5 seconds. The resulting change in color of the strip was compared with manufacturer's color chart to estimate the amount of (protein, blood) in the urine.

Filtration Concentration Technique:

Urine samples were analyzed according to Pugh (1978).[17-20]

Using a standard filtration technique. A 13cm Nucleopore polycarbonate filter paper was inserted in the filtration unit. After shaking, the urine sample (10 ml) of it was withdrawn with the help of a syringe and injected into filtration unit. After filtration, the filter paper was carefully removed using a pair of forceps and placed on glass slide then covered with cover glass. Examined systematically under the microscope at ×10 magnification. All the eggs were counted and the result was recorded as parasite load and expressed as number of eggs per 10 ml (number of egg/10 ml) of urine.

Data Collection:

The studied population and the primary data were subjected to standardize questionnaire interview with specific design.

Data Analysis:

All statistical analysis was carried out by using Graph Pad prism 5 software. The one - way ANOVA and student t-test was employed for analysis of differences between groups.

$p < 0.05$ considered significant.

Out of 200 urine samples examined, the total prevalence of *S.haematobium* infection was 24%. The prevalence of infection with *S.haematobium* was 25%. According to age in Abo Bakr Alsadig school from100 samples examined, As shown in the **table 1**

Results:

Table 1: The prevalence of urinary schistosomiasis infection according to age in Abo Bakr Alsadig School:

Age group	No. sample	No .infected	No .uninfected
8-10	50	16 (32%)	34 (68%)
11-13	50	9 (18%)	41 (82%)

The prevalence of infection with *S.haematobium* was 23% according to age in Khalid Ibn Al walid school from100 samples examined, as shown in **table 2**.

Table 2: The prevalence of urinary schistosomiasis infection according to age in Khalid Ibn Al Walid School:

Age	No. sample	No .infected	No .uninfected
8-10	50	10(20%)	40 (80%)
11-13	50	13 (26%)	37 (74%)

Discussion:

In Sudan, Prevalence of intestinal and urinary schistosomiasis among school children continues to be a major public health problem[21,22].

The urinary schistosomiasis in children causes chronic infections which can negatively affect all aspects of children health, nutrition and learning

Schistosomiasis infection during childhood cause substantial growth retardation and anemia. Also cause structural abnormalities of urinary tract. It the most common cause of hematuria in countries where the disease is endemic. [23- 26]

The bladder, lower ureters, urethra, seminal vesicles, uterus, cervix, and vagina were the sites usually affected. [27]

The main presenting features of urinary schistosomiasis are painful terminal hematuria, loin pain, and symptoms of secondary bacterial infection[28-31].

State Symptoms associated with genital

The prevalence of the disease was found to

Schistosomiasis are dysmenorrheal, menorrhagia, leucorrhea, lower abdominal pain, and intermenstrual bleeding. [32]

From the results, urine samples collected for urinary schistosomiasis given a prevalence of 24% of which 12.5% was reported from the Abo Bakr Alsedig School (far and 11.5% from Khalid Ibn Al Walid School. The prevalence is slightly higher in Abo Bakr Alsedig when compared with Khalid IbnAl Walid this variation is not statistically insignificant but the prevalence rate may higher due to drinking water of (Hafir) and many displaced people in the school of Abo Bakr Al Sedig. In the school of Khalid Ibn Al Walled is less common because of the drinking water of the pipes. According to several previous studies White Nile, lower in Al Liya area (Kosti) and in Gos Alsaalaam area (Kosti). Compared with the (Hussien2016), and (Ahmed2006),

be Present study, the prevalence of infection with urinary schistosomiasis in Algablin village is higher than prevalence in (El Tawella, Al Liya, and Gos Alsaalaam), this may be due to the presence of displaced people in the studied area and may also be attributed to the drinking water sources**.**

Conclusion:

The study concluded that the prevalence of *S.haematobium* parasite infection is 24% in the studied area, and that the prevalence of urinary schistosomiasis was higher in age group 8-10 years than age group 11-13years. Not how the school near or far from the river and the use of the toilets shows importance with regard to urinary schistosomiasis. But education and sources of water used for drinking or swimming was significantly correlated

Recommendation:

Improving the hygiene through good sanitation and provision of latrines reduces water contamination. Mass treatment should Should be eradicating the infection rate in the studied area. The study advised to implement more schistosomiasis control strategies to reduce the prevalence.

It is Necessary to develop appropriate interventional programs for controlling schistosomiasis, targeting the people in White Nile State. More health education programs should be held to teach the people how to avoid schistosomiasis. Snail control should be carried to get rid of vector and to cut the disease life cycle. More prevalence studies were needed throughout the country as well as the White Nile State to provide information about the schistosomiasis.

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