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RESEARCH PAPER

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Prevalence of Schistosomiasis among Basic School Pupils at Geissan Locality Blue Nile State, 2014

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ABSTRACT

We conduct this study to measure the Prevalence of Schistosomiasis among basic school pupils at Geissan Locality Blue Nile State, 2014. Cross-sectional descriptive study to measure the Prevalence of Schistosomiasis among basic school pupils at Geissan locality blue Nile state. Sample size determined using the following statistical formula. n= $z^2.pq/d^2$ = (3.84) *.5*.5/.0025= 384 pupils. The data were collected by the flowing methods, Urine Examination, Stool examination and questionnaire. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 16. The association between different variable were checked using chi square test. A value of p<.05 was regarded as significant. The S. haematobium prevalence was found (19.8) , and zero S. mansoni , there was a significant relationship between gender of the pupils and infection with Schistosomiasis is highest among male (14.8) than female (5%) with significant (P value =0.041) ,the prevalence of infection was high among age group between(11 -15 years) (13.32%).

The S. haematobium prevalence was found (19.8), and zero S. mansoni , male more affected with Schistosomasis than female and the prevalence of infection was high among age group between(11 -15 years) .
Key: Prevalence, Schistosomasis, Pupils, Schistosoma haematobium and Geissan.

INTRODUCTION

Schistosomiasis, also known as bilharzia, is a disease caused by parasitic worms. Infection with *Schistosoma mansoni*, *S. haematobium*, and *S. japonicum* causes illness in humans; less commonly, *S. mekongi* and *S. intercalatum* can cause disease. Although the worms that cause schistosomiasis are not found in the United States, more than 200 million people are infected worldwide (CDC, 2011). At least 243 million people required treatment in 2011.Treatment should be repeated over a number of years. Schistosomiasis transmission has been documented in 78 countries. However those requiring treatment targeted at most at-risk population groups live in 52 countries (WHO, 2013).

Schistosomiasis is a major human parasitic disease in tropical and subtropical countries in Africa, the Middle East and South America. Epidemiological studies in endemic human populations have shown that Schistosome prevalence and intensity levels rise to peak in childhood (around ages 9–14) and decline thereafter, so that in any endemic population, children carry the heaviest infection levels while adults carry little or no infection. (MUTAPI, 2011).

Schistosomiasis is one of the world's most widely distributed and prevalent parasitic diseases, with approximately 700 million people at risk of infection. The vast majority of human cases of the disease are found in Africa, with distribution in virtually all corners of the continent, bar the Sahara and Namibia deserts and the depths of the Congo jungle (Hotez et al, 2009).

Schistosomiasis, also known as bilharziasis, is caused by five species of Schistosome. The worm is transmitted by infected snails which live in freshwater habitats and release infective larval forms of the parasite. Consequently the people most at risk are those who engage in agriculture and fishing, and who use water for household chores. Ecotourism also partly accounts for the persistence and, in some instances, increasing prevalence of the disease (Chitsulo et al, 2000).

Schistosomiasis, a parasitic infection caused by Schistosome flukes, affects 207 million persons worldwide, mostly in sub-Saharan Africa (Steinmann et al, 2006).

Schistosomiasis is a disease of poverty that arises in areas with poor Sanitation where people come into contact with urine- or feces contaminated Water as part of their daily lives (CDC, 2011). Individuals living in endemic countries are most commonly infected during childhood, and the prevalence peaks between the ages of 10 and 20 years (Mbabazi et al, 2011).

Schistosomiasis is collective for the clinical syndrome resulting from infection of the five species of Schistosoma adapted to man, as there are at second behind malaria in terms of socio-economic and public health importance (Judith, 2010).

Schistosomiasis is one of the most widespread of all parasitic infections of man. The World Health Organization (WHO) estimated that Schistosomiasis and soil transmitted helminthes represent more than 40% of the global disease burden

caused by all tropical diseases, excluding malaria (WHO, 2006). The main features of the life cycle are similar for the various Schistosome species that cause disease in humans (Peter, 2013).

Transmission of Schistosomiasis: The transmission of Schistosomiasis depends on the presence of aquatic or amphibious intermediate snail hosts and the disease is therefore closely related to water bodies and water courses (Yang GJ et al, 2010).

The maturation process in the snail is governed by the ambient temperature, while the shedding of cercariae (the infective stage) from the snail not only requires water of proper temperature but also sufficient day light. Once emerged from their snail host, the cercariae move towards the surface, contaminating the water and thus turning the area into one of risk for Schistosome infection. When humans and/or other definitive animal hosts are exposed to water under such circumstances, the cercariae home in, penetrate the skin and move through the systemic circulation via the lungs and liver to finally settle in the mesenteric microcirculation (Sun , 2011).

Schistosomiasis transmission takes place where the ecologies of the schistosome parasite, the aquatic snail intermediate host, and the human definitive host converge in space and time in surface waters (Kloos et al, 2002).

Transmission of the Schistosome parasite to the definitive host occurs in freshwater. Free-swimming cercariae, released from the freshwater snails that act as intermediate hosts, penetrate the skin of the definitive host and migrate in the blood through a number of tissues before they eventually come to reside in the mesenteric blood vessels of the intestine. Here, the adult worm's pair and, following sexual reproduction, the female parasites release thousands of eggs that make their way through the intestine or bladder wall and are passed in the feces or urine. On contact with water, the eggs release miracidia that infect the intermediate host, thus completing the life cycle (Mark et al, 2009).

Signs and symptoms of Schistosomiasis: Within hours after coming in contact with infested waters, you may develop acute signs and symptoms such as itchy skin or a rash where larval forms of the parasites, cercariae, have penetrated. Fever, chills, cough, fatigue and muscle aches can begin within 1-2 months of infection, known as Katayama Fever, when adult Schistosomes begin releasing eggs into the body. Some individuals may not exhibit symptoms at this early phase of infection, which means the disease can progress untreated to the development of late and potentially life threatening chronic stages. There are two main types of chronic infection (Haymann, 2004).

Urinary Schistosomiasis: (Infection with S. haematobium) causes damage to various tissues, particularly the bladder and liver. Adult Schistosome lives around the blood vessels of the bladder and release eggs that can become lodged in these tissues thereby causing pain and inflammation. Urination becomes painful and is accompanied by progressive damage to the kidneys which may result in blood in the urine. Cancer of the bladder is common in advanced cases (WHO, 2001).

Intestinal (Hepatic) Schistosomiasis: (infection with *S. intercalatum, S. japonicum, S. mansoni, S. mekongi*) causes damage and enlargement to the liver, spleen and intestine. The adult Schistosomes reside in the blood vessels lining the intestine and release eggs that can become lodged in the veins and the

walls of the intestine. Lesions can form and hypertension of the abdominal blood vessels may occur. Bleeding from these vessels leads to blood in stools and can be fatal, especially in children (WHO, 2001).

The intermediate host of Schistosomiasis: Snails are of great concern in agriculture, medical and veterinary practices due to their damage in agriculture, horticulture and forestry as well as their main role as intermediate hosts for the trematodes causing Schistosomiasis and fascioliasis in humans and domestic animals (Radwan et al, 2007).

The intermediate hosts of Schistosomes in Africa are freshwater pulmonate snails, which belong to the "Planorbidae" family. The species belong to two genera, namely Biomphalaria, host for *S. mansoni*, and *Bulinus*, host for *S. haematobium* and *S. intercalatum* (Boelee et al, 2006).

Prevention and control: Comprehensive control programs should include treatment, provision of safe water, adequate sanitation, hygiene education, and snail control .The control of Schistosomiasis is based on large-scale treatment of at-risk population groups, access to safe water, improved sanitation, hygiene education and snail control. The WHO strategy for Schistosomiasis control focuses on reducing disease through periodic, targeted treatment with Praziquantel. This involves regular treatment of all people in at-risk groups (WHO, 2013).

From observation it appears that age and gender play an important role in risk behavior. A large part of contamination stems from children, who often have high intensities of infection, and who urinate and defecate in water during play. Investigated hygienic practice of school children, and mothers with infants in relation to defecation in village in north Senegal, they found that more than two thirds of schoolchildren rarely or never used latrines (latrines are available to 90% of the village population). Reasons for not using them include that they were not available, they were dirty, occupied or distressing, or that they used the latrine at school. The study also reported that 24% of the children defecated near or in water. Adults may also prefer to relieve themselves near water or in order to wash afterwards. A systematic study of execration behavior and its effect on transmission of *S. mansoni* in the Gazira irrigated area of Sudan suggested that privacy was more important to adults defecating than access to water for washing bodies or hands afterwards (WHO,2008).

MATERIAL AND METHODS

Study Design: A cross-sectional descriptive study

Study area and population: Blue Nile State Sudan consists of six localities. Geissan localities at (West) Ethiopia at (South East) Sinar State- Singa locality at (North East), and it lies at latitude 12-11 and 24-25 longitude, A total population is about (136760) according to 2008 country census with 18600 families. The main tribes in the area are Housa, Falata, Hamag, and Barta. Most of the people in the area work as farmers. The groups targeted by the study are the pupils in the basic schools with a total number of 1250 pupil distributed in the four basic schools in the area.

Sampling techniques: Sample size determined using the following statistical formula. $n= z^2.pq/d^2 = (3.84) *.5*.5/.0025= 384$

Data Collection and analyze : The data of the study were collected by the flowing methods, Urine Examination, Stool examination and questionnaire, The collected data was analyzed using

Statistical Package for Social Sciences (SPSS) version 16,The association between different variable were checked using chi square test, A value of p<.05 was regarded as significant.

RESULT

The *S. haematobium* prevalence was found (19.8), and zero *S. mansoni*, there was a significant relationship between gender of the pupils and infection with Schistosomiasis is highest among male (14.8) than female (5%) with significant (P value =0.041), the prevalence of infection was high among age group between (11 -15 years) (13.32%).

Table 1. Illustrate the relationship between pupil's age groups and infection with *Schistosomiasis* - Ganiss-2011.

(n = 398)

Age groups	Infected	No infected	Total
5– 10 years	20(5.2%)	143(35.93%)	163(40.95%)
11 – 15 years	54(13.32%)	144(36.18%)	197(49.5%)
Up to 15 years	6(1.51%)	32(8.04%)	38(9.55%)
Total	79	319	398(100.0%)

$\chi 2 = 81.25$ P-value = 0.034significant

Table 2. Show the relationship between pupil's sex and infection with Schistosomiasis- Ganiss-2011.

(n = 398)

Gender	Positive	Negative	Total
Male	59(14.8%)	156(39.2%)	215(54.0%)
Female	20(5.0%)	163(41.0%)	183(46.0%)
Total	79	319	398(100.0%)

$chi^2 = 54.21$ P-value = 0.041 significant

Table 3. Show the relationship between pupil's infection with *Schistosomiasis* and their knowledge about *Schistosomiasis* - Ganiss- 2011.

(n=398)

Knowledge	Infected	No infected	Total
Yes	61(15.32%)	170(42.7%)	398(58%)
No	18(4.5%)	149(37.50%)	167(42%)
Total	79	319	398(100.0%)

$\chi 2 = 27.25$ P-value = 0.012 significant

CONCLUSION

The *S. haematobium* prevalence was found (19.8) , and zero *S. mansoni*, male more affected with Schistosomasis than female and the prevalence of infection was high among age group between(11 -15 years) .

RECOMMENDATIONS

The study was recommended by the flowing Increase health education among pupils in the study area to raise pupil's awareness about Schistosomiasis. Provide schools with safe water supply and latrines to decrease pupils contact with infested water early diagnosis and treatment.

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