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RISK FACTORS OF SCHISTOSOMIASIS AMONG BASIC SCHOOL PUPILS AT GEISSAN LOCALITY BLUE NILE STATE, 2014.

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ABSTRACT

We conduct this study to study the risk factors of Schistosomiasis among basic school pupils at Geissan locality blue Nile state, 2014. **Background**: cross-sectional descriptive study, to study the risk factors of Schistosomiasis among basic school pupils at Geissan locality blue Nile state. **Method**: Sample size determined using the following statistical formula. n= $z^2.pq/d^2$ = (3.84) *.5*.5/.0025= 384 puplis ,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). **Result:** The study found that there was a significant relationship between gender of the pupils and infection with schistosomiasis P value =0.041 ,(14.8%) males compare with 5% female. 88%of the pupils mentioned that they go to the lake and river for different purposes including washing, bringing water, swimming, Most of the pupils (51%) have urinated or defecated near lake water Low awareness of the target group about causative agent of disease (40%), mode of transmission (36%), method of controlling and prevention (39.5%) were the main factors of spreading the disease. **Conclusion:** The infection is more frequent among age 10-15 years. Schistosomiasis haematobium infection was more frequent in male (14.8%) than female (5%). Contact with the lake water was most significant in spreading of diseases 80% of pupils had extensive contact with lake water.

KEYWORDS: Risk factors, Schistosomasis, Pupils, School, Geissan.

INTRODUCTION

Schistosomiasis is a water- based disease which is considered the second most parasitic infection after malaria in terms of public health and economic impacts. The signs following infection are rashes or itchy skin. Two months after infection, fever, chills, cough, and muscles aches may occur, as the parasite mature. Untreated infections can result in blood in urine, and stools, and enlarged liver and spleen. In children there is a negative impact in term of growth, nutritional status, and cognitive development. Chronic infection leads to the disease of liver, kidneys, and bladder. Occasionally, the nervous system is affected the matter that lead to seizures, paralysis, or spinal cord inflammation (WHO, 2002).

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. This pattern has been taken to reflect the development of immune-meditated resistance to infection ⁄ re-infection (Mutapi, 2011).

However, the Global Burden of Disease Study attributes a disability Weight of 0·06 and an annual mortality of 14000 deaths per year to schistosomiasis. Based on 200 million infected people worldwide, the total number of Disability Adjusted Life Years (DALY) lost to schistosomiasis is estimated at 1·532 million per year, of which 77% are in sub-Saharan Africa (Lopez et al, 2006).

New meta-analyses indicated amorality estimate up to 280,000 deaths annually in sub- Saharan Africa alone. Many eggs, however, are carried to the liver where they become trapped and induce T cell-dependent immune responses that lead to the development of granuloma that destroy the liver architecture and eventually cause hepatomegaly and splenomegaly (Mark et al, 2009).

There are an estimated 207 million people infected with one of the major schistosomes, with more than 90% of the cases occurring in sub-Saharan Africa (Steinmann, 2006).

The geographical distribution of infection depends on the presence and ecology of the intermediate host, sanitary condition and human water contact pattern and its utilization for agricultural use, it is estimated to infect 200-300 million people and to be endemic in more than 74 tropical developing countries, Schistosoma haematobium causes more than half (at least 112 million) of worldwide schistosome infections (WHO, 2002).

Though that the disease started in Sudan as for back 2600B.C.it is mentioned also that Schistosomiasis had been introduced in the Sudan through political and economic contact with Egypt it is also suggested that the thousands of pilgrim from west Africa flowing through country to and from Maca, played an important part in the transmission of the disease (Khartoum MOH, 2002).

Schistosomiasis was reported at the state since 1970s.infection was reported to be due migration of the people from the source of Bilharziasis e.g. (Algezira and Almanagel) by the presence of quantity of water especially in dams and other streams, and presence of fresh water snail (BNS-MOH ,2011).

The potential for reducing the incidence of Schistosomiasis was related to the technical design of water sanitation projects, design technology should be direct at improving the safety of drinking water and minimizing contact with infected water, to this end comprehensive approach considering water supply, excreta disposal, storm water, domestic drainage and bathing and laundry facilities are needed , laundry and shower facilities that reduces contact with contaminated water can be incorporated into most water supply programs. Coordination with existing water and sanitation programs will allow all endemic counties to embark on feasible, realistic and sustainable strategies for reducing the prevalence and severity of Schistosomiasis. One of the most importance results that have been established by the Blue Nile Project. In an investigation completed in the study of Gazira, Managil and Rahad zones was that the school children were the highest infected group in terms of prevalence and intensity. In term of liver enlargement, the prevalence of Schistosomiasis was found 60-70% even greater in the Managil extension(WHO,2000).

Socioeconomic status has significantly influenced the transmission and spread and treatment of schistosomiasis in Brazil. High infection rates persist among both the rural and urban poor. Rural living, poor housing and water supplies and low educational level were majer factors in schistosomiasis occurrence among agricultural populations. In urban areas, prevailing living conditions in Shanty town and labor migration from and periodic return movements to rural areas were predictive of schistosomiasis. The risk of the establishment of new transmission foci exists in both rural and urban areas, conferred by and affecting poorer people. Association between schistosomiasis and socioeconomic parameters, persisting inequities in health services accessibility, prevailing health impact of schistosomiasis. And the ongoing decentralization of health services point to opportunities and strategies for focused interventions aimed at promoting health enhancing behavior and living conditions and improving acsses to health care (Elsevier, 2008).

About 160 million people are infected with schistosomiasis .studies showed that having access to improved water supply and sanitation could reduce the infection rate by up to 77%. Safe water, adequate sanitation, and hygiene education are basic human rights that protect and improve health, increase the sense of well-being and improve economic and social productivity (WHO, 2001).

The development of water resources for agricultural production and to generate energy continues significantly to the spread of Schistosomiasis, an example of this came from Northern Senegal where the completion of a dam near the Senegal river and the rehabilitation of an irrigation scheme lead to the rapid and foreseen invasion of the canal and the river by biomphalaria perfferi, become endemic of Schistosomiasis due to S-mansoni infection. In many countries, river basin development authorities had been established that were responsible for integrated management of ministries of health in planning and management of these authorities was of great important for effective control of all water associated parasitic diseases and particularly Schistosomiasis monitoring and necessary modification of environment determine relevant to the epidemiology of Schistosomiasis and other parasitic should provide bases for strengthening health services and improving human health status (WHO, 2000).

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).

Limiting human water contact offers long-term control of Schistosomiasis. Health education is a fundamental component that ensures community participation in control interventions. In areas of high prevalence of Schistosomiasis infection, chemotherapy with Praziquantel targeted at school age children and high risk groups offers the most efficient way to achieve the recommended strategy for morbidity control. Proper health impact assessment of new irrigation schemes and other water resources project will provide a solid basis for health safeguards and construction plans (WHO, 2006).

A major factor associated with the intensification of schistosomiasis is water development projects, particularly man made lakes and irrigation schemes, which can lead to shifts in snail vector populations. Population movement has also extended the range of the disease in some areas. Rural urban migration, forced displacement and the rise of ecotourism have all contributed to the increase in schistosomiasis (WHO, 2007).

For those who are continually reinfected by contaminated water, schistosomiasis causes a chronic disease over decades. While the mortality caused by schistosomiasis is low, the morbidity is high, and includes anemia, stunted growth, and decreased ability to learn in children (WHO, 2010).
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).

Health education is integrated to the primary mission of schools. It provide young people with the knowledge and skiils they need to become successful learners and healthy and productive adults Health education helps pupils to attain health knowledge and skills that are vital to success in school and the work place such as setting personal health goals, resolving conflicts, solving complex problem, and communicating effectively. Also health education helps pupils to be better in their other studies (CDC, 2011).

Biological control had attracted serious consideration despite the extensive literature on predators. The use of molluscivorous fish like cichlid fish (Astatoreochromis Alluaudi) for biological control of snail intermediate hosts of schistosomiasis is regularly reappearing them in the literature onschistosomiasis control. The effectiveness of this control method has not yet been demonstrated, and conclusive field evidence is lacking (slootweg, 2004).

Clearance from canals as a method for snail control in Egypt. This entails altering in some physical way in water bodies so as to make them unsuitable for snail life. This can be achieved by the complete removal of the snail habitant, by destroying water plants at lakes and stream edges either manually or with herbicide, and by modification of irrigation practice and water management techniques. This could include increasing water velocity, stream straightening, canal lining and altering canal design (Boelee et al, 2006).

Snale control according to WHO criteria was a key factor in in the control of transmission of schistosomiasis and can be achieved by minimizing the risk of the infection from new water conservation and irrigation schemes as well as hydroelectric development (WHO, 2002).

Praziquantel: The current drug of choice for use against human schistosomiasis is Praziquantel.The drug was developed in the 1970s and, due to its extremely low toxicity against mammalian cells and high efficacy against all Schistosoma species, it has become the most widely used against the disease (Mark et al, 2009).

MATERIAL AND METHODS

Study Design: A cross-sectional descriptive study was conducted among basic school pupils with an objective to study the risk factors of schistosomiasis among the pupils.

Study area: Blue Nile State consists of six localities (Damazin, Alrosseiris, Bau, kurmuk, Gaisan & Todamun), Arosairis locality bounded by Aldamazin and 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.

The Study Population: A total population is about (136760) according to 2008 country census with 18600 families..Most of the people in the area work as a 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.

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

Method and Data Collection: The data of the study were collected by the flowing methods, Urine

Examination, Stool examination and questionnaire prepared and tested questionnaire was used to collect data from the targeted pupils, includes various factors related to spread of Schistosomiasis.

Method of data analysis: The collected data was analyzed using Statistical Package for Social Sciences (SPSS) using chi square for association between different variable.

Ethical clearance: Ethical permission for the study was obtained prior data implementation, by consulting and receiving approval from, Ministry of Education, Locality Education Office, Community Leaders, Pupil's Families, Schistosomiasis Control Program, and Heath Director Ship of the City.

RESULT

The study found that there was a significant relationship between gender of the pupils and infection with schistosomiasis P value =0.041 significant (14.8%) males compare with 5% female. 88%of the pupils mentioned that they go to the lake and river for different purposes including washing, bringing water, swimming. Most of the pupils (51%) have urinated or defecated near lake water Low awareness of the target group about causative agent of disease (40%), mode of transmission (36%), method of controlling and prevention (39.5%) were the main factors of spreading the disease.

Table (1): Show the relationship between pupils infection with Schistosomiasis and their water sources (n = 398).

Water sources	Infected	No infected	Total
Lake and river	71(17.8%)	290(72.9%)	361(90.7%)
Hand pump	2(0.5%)	7(1.76%)	9(2.3%)
Deep weal	2(0.5%	6(1.5%)	8(2.0%)
Public network	1(0.25%)	3(.75%)	6(1 %)
Other	3(0.75%)	13(3.25%)	14(4%)
Total	79	319	398(100.0%)

p-value = 0.074 $\chi 2 = 24.32$

Table (2): Illustrated the relationship between pupils infection of Schistosomiasis and their contact with water (n = 398).

Contact with water	Infected	No infected	Total
Yes	68(17.1%)	282(70.9%)	350(88.%)
No	11(2.8%	37(9.2%)	48(12%)
Total	79	319	398(100.0%)

p-value = 0.024 significant $\chi 2 = 53.39$

Table (3). Show the relationship between pupil's age groups and infection with Schistosomiasis (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 = 0.034 significant

Table (4): Illustrate the relationship between pupil's gender and infection with Schistosomiasis (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%)

Significant p-value = 0.041 $chi^2 = 54.21$

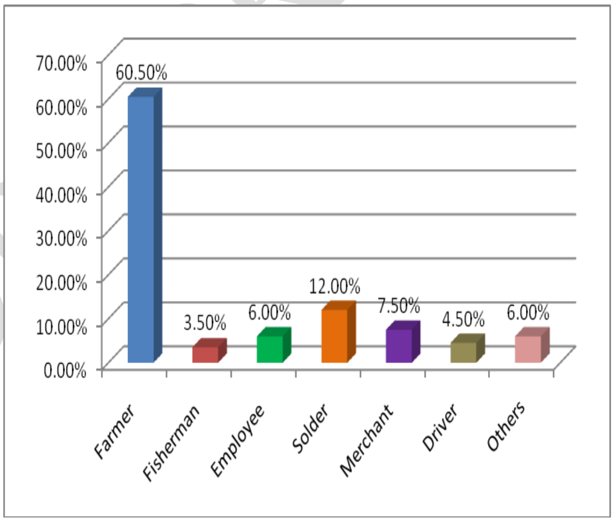

Fig (1). Show The occupation of the pupil's fathers-(n=398).

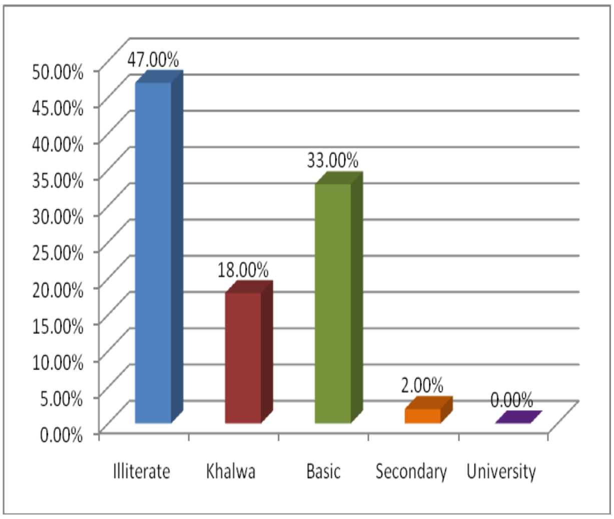

Fig (2). Illustrate The educational Level of pupil's mothers –(n=398).

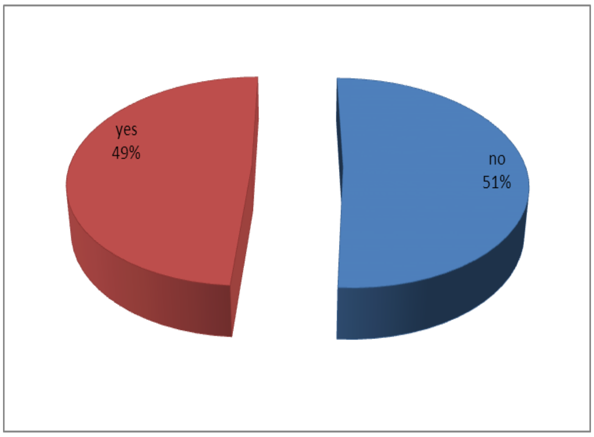

Fig (3). Show the defecation or urination of the pupils nearby or in lake or river (n=398).

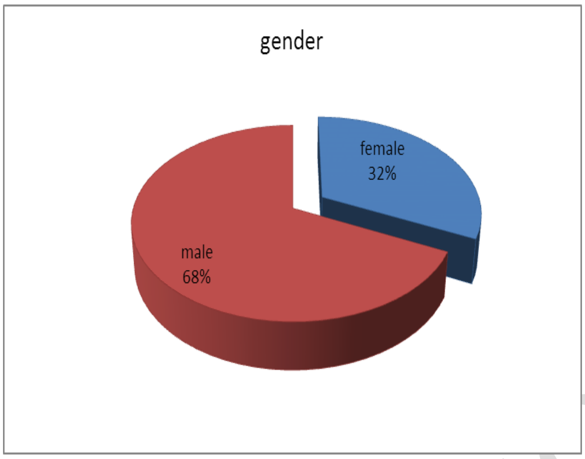

Fig (4). Illustrate The distribution of infected pupils according to the sex (N=79).

CONCLUSION

The infection is evident and more frequent among age 10-15 years. Schistosomiasis haematobium infection was more frequent in male (14.8%) than female (5%). Contact with the lake water was most significant in spreading of diseases 80% of pupils had extensive contact with lake water.

Recommendation

- Advocating environmental changes like provision of safe water supply and latrines as enabling factors to enhance health practice.

-Strengthening school health programs by doing routine investigation and examination for all pupils.

-Social mobilization and commitment of active community participation are essential in controlling the disease.

-More coordination between heath sectors and other related sectors are highly recommended.

Snail control programs should be conducted.

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