The Magnitude of Urinary Schistosomiasis among School Children in El Gorashi Sector, Gezira State, Sudan

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Abstract: A cross-sectional study was conducted to estimate the prevalence of urinary Schistosomiasis in 2 rural Sudanese basic level schools; the schools were selected randomly from El Gorashi sector, at Matoog locality, El Managle province, Gezira State, Sudan. In each school, all students between 7-17 years olds were selected, 395 students composed 256 males and 139 females were 193 from Al Fakhaheer and 202 from Ahmed El Mostafa School. Data was collected by questionnaires, observation and interview and similarly urine sample was examined from each child. The Epidemiological data setup was created by (Epi Data3.0) software and analyzed by the Statistical Package of Social Sciences (SPSS12.0) software. The results showed that the prevalence of schistosoma haematobium for the search schools was 28.5% in Al Fakhaheer, 38.6% in Ahmed El Mostafa, so that mass treatment for school's children and increase the awareness of control and prevention programs to the students, teachers, parents and community members by intensive programs of health education in the area is strongly recommended.

Key words: Urinary schistosomiasis, school children, Gezira state, Sudan

INTRODUCTION

Schistosomiasis is one of the most widespread of human parasitic, some time called (bilharziasis) (www.who.ch). It is in the second rank after malaria in terms of its socioeconomic and public health importance in tropical and subtropical areas. It is also the most prevalent of the waterborne disease and one of the greatest risks to health in rural areas of developing countries. At present, 200 million persons in 74 countries and territories harbor this infection, yielding 20 million cases of severe disease and approximately 100 million symptomatic infections (Michael *et al.*, 2005). Therefore, Schistosomiasis causes a number of problems, for children affecting their physical and mental development, as well as their performance (www.unesco.org). Although most people in areas of endemicity have high infections with no symptoms, the effect of Schistosomiasis on a country's health and economy are serious (www.who.int). The objectives of this study, was to investigate the magnitude of urinary Schistosomiasis among schools' children in Sudan.

MATERIALS AND METHODS

Area of study: The cross-sectional study was conducted in El Gorashi Sector, at Matoog Locality, El Managle Province in Gezira State. Gezira State is one of the 26 State of Sudan, lies between the Blue and the White Nile in the East central region of the country, it has an area of 23.373 Km².

Population and sampling procedure: The total number of the population of the 2 villages is estimated to be 4080 and the total number of the students of the basic level school in these villages is 395 students. Sample has been chosen by means of random sampling technique. A total of 395 students composed 256 males and 139 females were selected from Al Fakhaheer and Ahmed El Mostafa sSchool.

Data collection: The data was collected directly from the field by questionnaire to draw information about: Demographic, socio-economic, source of drinking water, behavioral characteristics and by direct personal observation some points have been observed. Exactly 20 mL urine sample were collected from each student for Schistosomiasis analysis.

Data analysis: The data was processed by computer and data setup was created by Epidemiological data (Epi Data) version 3.0 software. Thereafter, data was analyzed by using the Statistical Package for the Social Sciences (SPSS) version 12.0 software.

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RESULTS AND DISCUSSION

Demographic and socio-economic: The results showed that most students' in schools were at 7-9 years old (Table 1). The level of their parents' education was variable (Table 2). In Alfakhaheer the 44% of students fathers were in primary school while their mothers were 51.3% illiterate. However, in Ahmed Almostafa School students' fathers and mothers are illiterate representing 38.6 and 46.5%, respectively.

Source of drinking water: The students in Alfakhaheer school were depend on canal as a source of drinking

water, whereas in Ahmed Almostafa were 505, 27.2 and 22.8% depends on well, water tap and canal, respectively (Fig. 1). The families of student were most of them own agricultural farm.

Urine examination: The results of urine examination showed that males compared with female were more affected in both Alfakhaheer and Ahmed Almostafa schools (Table 3). In addition, we observed that the distance between the canal and the villages not more than 1 km., the canals and ditches in the vicinity of the villages are full of weeds and clay some of them are only cleaned during the beginning of the agricultural season.

Table 1: Ages distribution of children at the schools

School name	Date of birth	Results Positive (%)	Negative (%)	Total (%)	Chi-square
Alfakhaheer	7-9 years	21 (10.9%)	75 (38.9%)	96 (49.7%)	4.115
	10-16 years	29 (15.0%)	54 (28.0%)	83 (43.0%)	
	Over17	5 (2.6%)	9 (4.7%)	14 (7.3%)	
	Total	55 (28.5%)	138 (71.5%)	193 (100%)	
Ahmed Almostafa	7-9 years	28 (13.9%)	66 (32.7%)	94 (46.5%)	20.490
	10-16 years	37 (18.3%)	57 (28.2%)	94 (46.5%)	
	Over17	13 (6.4%)	1 (.5%)	14 (6.9%)	
	Total	78 (38.6%)	124 (61.4%)	202 (100%)	

Table 2: The education level of parents of the schools' children

School name	Result	Father's level of education Illiterate	Primary	Intermediate	Secondary	High Edu	Total
Alfakhaheer	Fathers	52 (26.9%)	85 (44.0%)	30 (15.5%)	13 (6.7%)	13 (6.7%)	193 (100%)
	Mothers	99 (51.3%)	75 (38.9%)	5 (2.6%)	8 (4.1%)	6 (3.1%)	193 (100%)
Ahmed Almostafa	Fathers	78 (38.6%)	58 (28.7%)	23 (11.4%)	25 (12.4%)	18 (8.9%)	202 (100.0%)
	Mothers	94 (46.5%)	59 (29.2%)	28 (13.9%)	15 (7.4%)	6 (3.0%)	202 (100%)

Table 3: The distribution of schools' children according to the result of urine examination

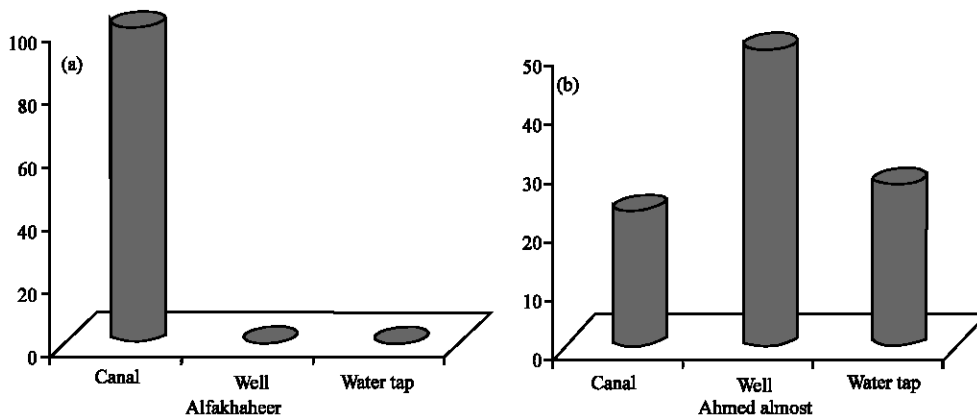| School name	Sex	Results Positive (%)	Negative (%)	Total (%)	Chi-square
Alfakhaheer	Male	43 (23.3%)	87 (45.1%)	130 (67.4%)	4.099
	Female	12 (6.2%)	51 (26.4%)	63 (32.6%)	
	Total	55 (28.5%)	138 (71.5%)	193 (100%)	
Ahmed Almostafa	Male	58 (28.7%)	68 (33.7%)	126 (62.4%)	7.774
	Female	20 (9.9%)	56 (27.7%)	76 (37.6%)	
	Total	78 (38.6%)	124 (61.4%)	202 (100%)	

Fig. 1: Source of drinking water in the study area A. Alfakhahee , B. Ahmed Almostafa

Regarding to the snails (Bulinus and Biomphalaria) it has been found that there is a reproduction of it all around the canals and ditches in variable quantities.

The average age of the children in this study between 7-17 years old, explained that the pupils in each school they had high rate of contact with the canals which may increases the prevalence of Schistosomiasis in the area which confirmed by (UNESCO, UNICEF and WHO, 2004).Children between the age of about 6-16 years old, who swim and play in or near the lakes and the irrigation canals are particularly at risk because they spend long hours in the water and their entire bodies are exposed. The majority of target groups are farmers, therefore children are usually go to the farm to help their parents, which increases their contact with water and that assists on the spread of the disease which confirmed by (Wisner and Adams, 2002; Goldman and Dennis, 2004; unisco.org). Most of the villages in this study, depend on the canals as the main source of drinking water and other activities in their life. The low level of parents' education it may increase the risk factors to be infected with the disease. This confirmed by Richard (2004) (schisto.org;facstaff. uww.edu).

From this study, we observed that the distance between the canals and the (villages and schools) not more than (1-½ km) and there is a great percentage of children who goes to play after school duration in the canals so that explain the prevalence of the disease in the area, this confirmed by (Eldryd *et al.,* 2004) the peak of cercarial densities found during the middle of the day and this is the time when water containing infected snails is most infectious. Our results showed that the males middle order pupils are more infected, this presumably due to higher water contact activities male pupils of the middle age group were particularly involving into farming and irrigation and this facilitated their swimming and bathing in cercariae-infected canals. In addition, females are generally restricted from swimming and bathing in the canals or religious and socio-cultural grounds. This is similar to the observation made by (Wisner and Adams, 2002). The prevalence of the Schistosomiasis among the pupils in this study in individual's schools ranged from 28.5-38.6%. Studies in some other African countries among schools children showed that the prevalence of Schistosomiasis was varying from 7-64% in the Sahel and from 37-72% in Mayo Kibbi in Chad (Michael and Simon, 2000) and 18-20% among the aged 10-20 years in Egypt (ajtmh.org) and 62.8% in Cameroon (ugent.be) and 64.9% in Tanzania (sbf.admin.ch/htm) in Zambia ranged from 7.5- 37.5% (medguide.org) and in Nigeria ranged from 11.3- 27.8% (Okoli *et al.,* 2006) also was confirmed by the survey conducted by ministry of health Gezira State, Sudan (2005) in the area of this study among school children found the prevalence of the disease was 27%.

CONCLUSION AND RECOMMENDATIONS

Finally we recommend, mass treatment for school children should be carried out, selective population chemotherapy involving screening of the whole population through urine and stool analysis once year should be conducted and positive cases should be treated with Praziquantel and examined after three months of treatment. Increase the awareness of control and prevention programs to the students, teachers, parents and community members by intensive programs of health education in the area through the schools and mass media. Snail control with Miclosamide should be carried out by treating all water sources.

REFERENCES

Eldryd, P., G. Richard, M. David and G. Geoffrey, 2004. Principles of Medicine in Africa, (3rd Edn.), Cambridge University Press, pp: 411-420.

Goldman, L. and A. Dennis, 2004. Cecil Text Book of Medicine, (22nd Edn.), Paul Beeson, 2: 2106.

Michael, B. and B. Simon, 2000. A Survey of the Health of School Children in Chad, Department of infectious disease epidemiology imperial college school of Medicine, London WGIPG.

Michael, H.M., E.B. Robert, J.M. Anne and B. Jones, 2005. International Public Health, Disease, Programs, Systems and Policies, Print in the USA Publishers, pp: 188.

Ministry of Health Gezira State, Sudan, 2005. Control of Schistosomiasis Department records.

Okoli, C.G., J.C. Anosike and M.O.E. Iwuala, 2006. Prevalence and Distribution of Urinary Schistosomiasis in Ohaji/Egbema Local Government Area of Imo State, Nigeria. J. Am. Sci., 2: 45-48.

Richard, B., 2004. Advance in Molecular and Cellular Microbiology 4, Susceptibility to Infectious Disease, the Importance of Host Genetics, Cambridge University Press, pp: 337.

UNESCO, UNICEF, WHO, 2004. World Bank and Education International inter-agency flagship programme in EFA, a comprehensive school health approach to achieve EFA.

Wisner, B. and J. Adams, 2002. Environmental health in emergencies and disaster, a practical Guide, typeset in Hong Kong printed in Malta, World Health Organization.