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SCHISTOSOMA HAEMATOBIUM

AMONG EL-SEYAL VILLSGE COMMUNITY, SUDAN

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Abstract:

A community-based survey was carried out between March 1999 and August 1999 in El-seyal village,El-Mattema locality , River Nile State . The main objective of this study is to estimate the overall prevalence of S.haematobium among people aged ≥ 5 years , and to identify high-risk groups for infection with S.heamatobium.

A cluster sample (systematic sampling techniqw) of 354 persons aged ≥ 5 years was selected from 4198 persons from the two areas of the village (El-Seyal El-Sageer and El-Seyal El-Kabeer) was studied . 57.9% of them were males and 42.1% were females.

The target group was interviewed personally by the investigator or one of his assistans, so that to take the information from them. A semi-structured questionnaire was used for this purpose . Urine samples werw taken from all to be examined for ova of S.haematobium.

The study showed that the overall prevalence of S.haematobium was(54 per 1000). The findings of the study also indicated that there was a significant relationship between prevalence of S. haematobium and age, education, occupation, previous bathing or swimming in the irrigation canals. On the other hand residence in the village was not found to be related to S.haematobium infection.

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مجلة جامعة شندي العدد الثالث (يونيو 2006م) ISSN:1858-571X

In conclusion, the current study showed that S.haematobium infection is present in the area and identified a number of risk factors.

Raise the awareness of the people in this village and change their behaviors to avoid the infection of Schistosomiasis is recommended.

ملخص :

مسح اجتماعي اجري بين مارس 1999 إلى أغسطس 1999 في قرية السيال، محلية المتمة، ولاية نهر النيل، شمال الخرطوم بالسودان. وكان الهدف الرئيسي منه هو تقدير معدل انتشار مرضى البلهارسيا البولية بين مجتمع القريـة في محاولة لمعرفة الجماعات المعرضة لأعلى خطورة وعلاقة المرضى بالعوامل المتعلقة بلإصابة بالبلهارسيا.

عينة عنقودية من 354 شخص (عمر 5 سنوات أو أكثر) اختيرت من منطقتين من القـــرية (السيال الصغير والسيال الكبير) باستعمـــال أسلوب العينة المنتظمة البسيطة. كل الأشخاص المؤهلين للإنتخاب في القرية (منهم 57.9% رجال و42.1% نساء) قوبلوا شخصيا من قبل الباحث أو أحد مساعدوه الخمس لأخذ المعلومات منهم باستخدام استبانة منشأة مسبقاً ، كما أخذت عينات من البول لفحص البلهارسيا البولية.

أظهرت الدراسة أن معدل انتشار مرضى البلهارسيا في القرية حوالي 54 (من كل ألف شخص). كما أظهرت نتائج الدراسة أن هناك علاقة ذات معنى بين معدل انتشار مرض البلهارسيا وبين العمر، التعليم، العمل والإستحمام أو السباحة السابقة.

مجلة جامعة شندي العدد الثالث (يونيو 2006م) ISSN:1858-571X

من ناحية أخرى الإقامة بالقرية وجدت بأنها ليس لها علاقة ذات معنى بمعدل لنتشار مرض البلهارسيا في قرية السيال.

في ختام الدراسة الحالية تشير إلى وجود البلهارسيا البولية في قرية السيال . كما حددت عدد من عوامل الخطر المرتبطة بالمرض في المنطقة.

وأوصت هذه الدراسة بأهمية الوقاية من مرض البلهارسيا البولية في المنطقة ورفع وعي أفراد المجتمع وتغيير سلوكياتهم لتجنب الإصابة بمرض البلهارسيا.

Introduction :

Schistosomiasis (Bilharziasis) is a parasitic disease that leads to chronic ill health. It is caused by trematodes of the genus Schistosoma which are transmitted by freshwater snails . Theodor Bilharz (German pathologist) discovered these trematode worms in Egyptian patients in 1851 (Billharz, 1852).

The disease is widespread in man in tropical and subtropical areas, occurring in 74 countries. The World Health Organaization (1999) estimates that more than 200 million people are infected with Schistosomiasis and that at least 600 million people are at risk of acquiring the infection of Schistosomiasis.

Urinary Schistosomiasis affects 66 million children throught 54 countries. In some villages around Lake Volta in Ghana, over 90 % of the children are infected by the disease.

The main froms of human Schistosomiasis are caused by four species of a flat worm, known as Schistosomiasis, which are S. mansoni, S. japonicum, S.mekongi and S.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

haematobium. Others Schistosomiasis are incidental or potential human parasites (Chester, et al.,1984).

Schistosomiasis infect fresh water snails, where they have part of their life cycle within the snails. People are infected by contact with contaminated water used in normal daily activities such as fishing, swimming or irrigation. The cercarias directly penetrate the exposed skin of people coming in contact with infected water.

The overall prevalence of Schistosomiasis in an area of Sudan (Gazira- Managil zone) by the mid – 1970s was 70% for S.mansoni and among children exceeded 40%, whereas for S.haematobium 1% to 15%. (WHO,1993).

In 1967, an irrigation project was introduced in El-Seyal, a village about 173-kms north Khartoum, the capital of Sudan. Recently, Schistosomiasis was detected in the area(Osman,1997). That reason pushes me to do this study in the area.

The present study , is an effort to assess the magnitude of the problem in the village and identify potential risk factors.

Methodology:

A cross-sectional study was conducted among the population of El-Seyal village. El-Seyal village includes El-Seyal El-Sageer (area1) and El-Seyal El-Kabeer (area2), which are located on the West Bank of the River Nile, in El-Mattema locality.

The population of the study included all resident of El-Seyal village equal or above 5 years of age. The population of the village , about 4192 persons (2371 in area 1, and 227 in area2). Most of the people are farmers.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

The main source of water supply is an artisan well, in addition to the manual surface wells.

The sanitare condition are poor and although most of the people had latrines, many people still defecaete and micturate outside.

There is one hospital at El-Mattema town, one health center at El-Seyal El-Kabeer and one dispensary at El-Seyal El-Sageer.

There are 4 primary schools, 2 for boys and 2 for girls, and 2 secondary schools, 1 for each sex.

In 1967 an irrigation and agricultural project was introduced in the area.The area characterized by scanty rainfall during summer season with no rain during the winter season. Temperature rangs from 15° C in the cold season to 42° C in the summer season.

Irrigation uses open canals with water running through these canals all the year. Thus, favorable conditions are present for breeding of snails, which are the intermediate host of Schistosoma.

The children in the village favor and enjoy swimming and playing in the irrigating canals. This situation leads to greater contact between children and the canal water, and thus, more chancec for infection with Schistosomiasis .

Control activities against Schistosomiasis were not sufficient. The diagnosis and treatment facilities were poor and no snail control program was established in the area (Osman, 1997).

A sample of 385 persons was drawn from the study population, A cluster of systematic sampling technique was used to select every eleventh household. All household members equal or above 5 years of age who were available at the time of the visit were included in study. The

ISSN:1858-571X (يونيو 2006م) العدد الثالث

investigators walked from door to select the sample of households.

A total of 385 persons were selected, of whom 354 were actually included in the study. This sample size was sufficient to provide 95 % assurance that the margin of error will not exceed 3 % assuming that the prevalence of Schistosomiasis is 10 %. The formula used is:

$n = Z^2 (1-\alpha/2)\, p(1-p)/e^2$ (Lemeshow; et al, 1990).

Each person included in the survey was personally interviewd. The questionnaire gathered sociodemographic data as well as data about pervious history of Schistosomiasis and its potential risk factor.

Interviews were carried out by the study procedures. All interviews were carried out at homes of the participants using a semi-structured questionnaire. The non-response rate was 8 % (31 persons).

In addition each participant was requested to bring a 10-ml urine sample in a container provided by the laboratory of Shendi University.

Urine samples were analyzed in the same day of collection at Shendi University Laboratory. The technique used was that described by Monica Cheesbrough, (1987):"Mix the urine well and transfer 10 ml to a conical tube. If the urine contain blood, add two drops of saponin reagent to lyze the red cells. Centrifuge at slow to medium speed, not over 500 g (g = relative centrifugal force) for five minutes to sediment the eggs. Do not exceed 500 g, because this may cause hatching of the miracidia. Using a Pasteur pipette, remove and discard all supernatant fluid. Transfer the entire sediment to a slide and cover with a cover glass.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Examine the preparation urine samples microscopically for Schistosoma eggs".

Data from the questionnaires and results of the urine tests were entered into a computer and analyzed using the statistical package for social sciences (SPSS). Chi-square test was used for testing the association between prevalence of S .haematobium and potential risk factors. The level of statistical significance was set at P-value equal to or less than 0.05 for all tests.

Discussion of results:

The importance of this study came from that, it is one of the few studies on Schistosomiasis done in El-Seyal village. The high positive response of the village inhabitants and their cooperativeness contributed to completion of this study. Limitations of this study include its small sample size as well as being restricted to S. haematobium.

The questionnaire distributed in the present study was confined to very simple questions about the factors that were suspected to be related to Schistosomiasis.

The present study indicated that the overall prevalence of S. haematobium among Al-Seyal village community in north Sudan had decreased from 100 per 1000 in 1997 (Osman), to 54 per 1000 in 1999 (the present study) (table 1). That may be due to the reducation in the planning areas in the irrigating and agricultural project, because some of the irrigation canals became drought. And because the present study included all ages equal or above 5 years (table 2), compared with Osman study (1997), which included students with ages 6 – 18 years.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Table(1)

Prevalence of S. haematobium by areas

variable	**Total**	El-Seyal El-Sageer	El-Seyal El-Kabeer	p-value
No.of infected	19	11	8	P = 0.692
Prevalence per 1000	54	31	23	

In the present study, although males were likely to be infected with the disease than female (table 2), but no statistical association between sex and the prevalence of S. haematobium (table 3). This result may be due to the fact that, males have longer and more frequent contact with water canals than females in the village. Similar differences in prevalence of Schistosomiasis was observed in Jordan (Saliba; et al., 1997), in the While Nile province in Sudan (Salim, 1994), and by Farooq; et al, (1966).

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Table (2)

Distribution of the study population by area, age and sex

Age Group	Total	El-Seyal	
	%	Males	Female
<15	118	87	31
%	33.3%	42.4%	20.8%
15-26	98	50	48
%	27.7%	24.4%	32.2%
>26	138	68	70
%	39%	33.2%	47%
Total	354	205	149
%	100%	57.9%	42.1%

Age was strongly associated with S. haematobium infection. Children have a higher prevalence of the disease compared with others, because they swim and play in the irrigation canals (table 3). Similar results were reported by Saliba; et al., in Jordan, (1997), by Farooq; et al, (1966) and by Hesham; et al., in Egypt, (1992).

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Statistical association between the prevalence of S. haematobium and education was observed among the study population. The prevalence of the disease was zero among those have not educated, Osman (1997), and Farooq; et al, advancing ages. However, Osman (1997), and Farooq; et al, (1966) found no association between education and the prevalence of Schistosomiasis (table 3).

Students and farmers were at higher risk of infection with S. haematobium . than others. This relationship may be due to more water contact activities (table 3). The same difference in the occupation was reported in Nigeria by Arinola, (1995), who found that students were more likely to be infected with S. haematobium than local dry cleaners and vehicle washers. Salim. (1994), also reported a similar relationship between occupation activities and the prevalence of Schistosomiasis.

In the present study , there was no statistical relationship between the prevalence of S. haematobium and the residence in the village. The prevalence is higher among the residents (59 per 1000) compared with zero among non-residents (table 3). This is consistent with the results of Hesham; et al., (1992). However, the sample of non-residents in the present study was too small to present reliable estimates.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Table (3)

The relation between prevalence of S. haemtobium and a number of socio-demographic factors among the study population

variable	total	Prevalence per 1000	Number infected	p-value
Sex:				
Males	205	73	15	
females	149	27	4	P=0.099
Age:				
<15	121	91	11	
15-26	98	71	7	
>25	125	7	1	P=0.009
Education:				
Illiterate	41	0	0	P=0.016
Educated	313	61	19	
Occupation:				
Job Less	105	0	0	P=0.002
Student	137	102	14	
Farmer	31	97	3	
Others	81	25	2	
Residence in El_Seyal Village:	323	59	19	P=0.361
Residents	31	0	0	
Not residents				

Previous contact with water canals was significantly associated with the prevalence of S. haemtobium . This may be related to water cobtamination through micturition habits and extensive contact with contaminated water (table 4).Similar result was observed by Bausch; et al., (1997) in Cameroon, who found association between swimming in pools and Schistosomaisis. Also Saliba; et al., (1997) in Jordon found that the seven infected males had swam in an irrigation pool.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Table (4)

The relation between prevalence of S. haemtobium and previous contact with water

Variable	Total	Prevalence per 1000	Number infected	p-value
Previous bathing or swimming:				
Yes	133	128	17	
No	221	9	2	P=0.00006

The present study found a strong statistical relationship between haematuria and the prevalence of S. haemtobium (table5)>The prevalence is higher among those who have haematuria compared with those who don't. This may be due to the excretion of S. haemtobium eggs in the urine . Salim, (1994) reported a similar association . Some time haematuria indicated to others diseases such as stone in the Kideny .

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Table (5)

The relation between prevalence of S. haemtobium and a clinical profile for S. haemtobium among the study population

Variable	Total	Prevalence per 1000	Number infected	p-value
Haematuria				
Yes	31	322	10	***P=0.0001***
No	323	28	9	

People who were infected with S. haemtobium in their previous history, showed highest infection rates compared to those who were not infected in the past. This may be due to their risky behavior or job. A similar result was found by Nagaty , et al., (1996) in Egypt.

ISSN:1858-571X (يونيو 2006م) العدد الثالث

Conclusions:

The following could be concluded from the present study :

1- The overall prevalence rate of S. haemtobium in El-Seyal village community was 54 per 1000.
2- Statistical significant association was found by the present study between age, education, occupation, previous bathing or swimming, haematuria and prevalence of S. haemtobium.

Recommendations:

This study recommends the following :

- The present study was on S. haemtobium with small sample size, so further research is needed in this field, in the village as well as other nears, with large sample size, to studt the magnitude of the disease.
- It is useful, that Sudan Health Ministry establishes a control and prevention programme for Schistosomaisis , in the area.
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ISSN:1858-571X (يونيو 2006م) العدد الثالث مجلة جامعة شندي

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