

**A STUDY OF THE WATER CONTACT PATTERN OF SCHISTOSOMIASIS IN NIGERIA: FOR
ENTREPRENEURIAL AND DEVELOPMENT IN AGBOR, DELTA STATE, NIGERIA.**

Utebor Kester Egiliwebi, Utebor M. M. Emeke and Anyaiwe H. Ogochukwu
Department of Biology College of Education, Agbor, Delta State, Nigeria
Department of Works Oshimili North Local Government Council, Akwukwu-Igbo
Biology Department, College of Education, Agbor, Delta State, Nigeria

ABSTRACT

A study of the water contact pattern of schistosomiasis in Agbor was carried out from November to October 2010 to determine the water contact pattern and rate of contact, the observation covered a total of 43,200 during which primary water contact activates involving 624 exposures for a total of 9,541 minutes were recorded. Water contact pattern in the six sampling stations are highly seasonal, well pronounced with the contact being most intense in the rainy season and in the early hours of the day till about noon. The water contact behaviour in this area were quite age and sex related. Water contact pattern in this study was site specific with 76.1% of the total contacts made at the site where schistosomiasis type cercariae was also found.

Keywords : schistosomiasis, cercariae, sampling, agbor, seasonal

INTRODUCTION

The Federal Government of Nigeria came up with various reforms agenda which aim at improving the economy, health care on the critical component of Nigeria's vision 20:2020 on health care for Schistosomiasis, a parasitic disease caused by the trematode worm, *schistosoma haematobium*, *s. mansoni*, *s. japonicum*, *s. mekongi* and *s. intercalatum*. These result to a very serious public health problem in many tropical countries. About 200 – 300 million tropical may be suffering from the disease worldwide (WHO, 1993). The diseases is endemic in Nigeria. (Ogbe and Ogunsekan, 1995, Akogun et al., 1994 and Agi, 1995).

Water contact activities and traditional agricultural practices are reported as the factors in the distribution of the disease and its snail vectors

In Nigeria, *Biomphalaria* and *Bulinus* species of snails are implicated in the transmission of schistosomiasis (Brown, 1994, Ofozie et al., 2002).

These two genera of snails are aquatic and hermaphroditic. They are found in almost all types of water biotic, ranging from small temporary ponds or stream to large lakes or water bodies like irrigation canals and dams are particular, excellent habitats.

Records of prevalence and intensity of urinary schistosomiasis in areas of urinary schistosomiasis in area of endemicity show an infection pattern which seem to peak in individuals in their first two decades of life and with varying rates (Ogbe, 1995, and El – Harvey et al; 2000). When compared with their adult counterpart, children with schistosomiasis notably harbour greater worm burden and are more intensely infected due to the high to the transmission rates of the parasite and the frequencies of exposure to infection site (Ogbe, 1995).

In country with a long history of schistosomiasis research studies have identified. The risk factors for infection with *S. haematobium* as male gender, an age less than 20 years, living in smaller rural communities, exposure to canal waters reagent strip detected haematuris and proteinuria and a history of buring maturations (El – Harvey et al., 2000).

In Africa, *S. haematobium* is known to be transmitted by the plan or bid snails *Bulinus* species including *B. globosus*, *B. africanus*, *B. nasatus* and *B. senegalensis* have been incriminated as intermediate host of *S. haematobium* (Anosike et al; 2001).

The prevalence's intensity and related, morbidity of vesical schistosomiasis on the African continent vary according to the epidemiology, transmission pattern and ecology of each endemic foci recent. Studies (Anosike et al., 2001).

The distribution of schistosomiasis is however focal and restricted to areas with peculiar ecological characteristic, which favour infection by man. Water contact and extensive water are important factors in transmission.

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In Nigeria several epidemiological studies have showed a baseline data on the prevalence and intensity of schistosomiasis in various part or Nigeria (Nmorsi et al., 2002)

Thus schistosomiasis infection and water contact pattern are essentially linked (Husting, 1983; Kvalsvig and schutter; 1986). And level of infection are determined by complex interplay between level of exposure to snail infested and age related acquired resistance. Knowledge about water contact pattern is thus essential to elucidate the disease pattern and therefore for prevention of risky contact. Human contact studies are therefore an inevitable component of a sustainable control strategy.

This study therefore presents the result of a baseline human water contact study carried out as part of an overall pre-control investigation of schistosomiasis transmission in Agbor. The objectives of the investigation were to determine the contact pattern and snail infection rates in Agbor with a view to identify the risky contacts and transmission sites of schistosomiasis in the environment.

STUDY AREA

The study was carried out in Agbor, a rural community in Ika South local Government Areal, Delta State. The community is situated between latitude $6^{\circ}00'N$ to $6^{\circ}25'N$ and longitude $6^{\circ}05' E$ and $6^{\circ}25'E$ while Boji – Boji, Agbor is located between latitude $6^{\circ}08'N$ to $6^{\circ}17'N$ to $6^{\circ}1'N$ of the equator and longitude $6^{\circ}07'E$ to $6^{\circ}17'E$ of the Greenwich meridian.

MATERIALS AND METHOD

Observation on human water contact pattern were made in six water contact sites in Agbor. Two of the sites S_1 and S_2 were located on the upstream, (S_3 and S_4) were treated at the middle while S_5 And S_6 were located down streams. All the sites were easily accessible although they varied in ecological characteristic including macrophyte coverage and characteristic of substratum.

Each selected site for water contact studies was visited once every month for 12 months. Observation in each day for each site covered a period of 10 hours (8: 00 – 18: 00 hours). This amounts to 120hours of observation for all sites. During each observation, individual bio-data (sex, age) types of contact (i.e activities performed). Degree of contact (i.e proportion of body immersed) and duration of contact (i.e time expanded) were taken.

The various types of contact activities were categorized on the basis of the general purpose of contact. thus personnel contact (washing hinds, bothering) domestic contact (washing clothes and fetching recreational (swimming and playing), religions (baptism) and economic (fishing, washing farm produce and tools). Degree of exposure was also categorized as partial (involving only parts of the lower or upper limb for a long period of time) and complete exposures (involving a total exposures for a long period of time).

Statistical analysis:

Contingency test were used to determine differences in the frequency of contact between sites, time of day, seasons and age groups. For difference in duration of contact. Mann Whitney test was used when testing for two groups while Krus-kal –wallis one way analysis of variance was used for factors with more than two level.

Human water contact studies

General pattern of water contact in Agbor. Water contact observation in Agbor covered a total of 43, 200 minutes during which a primary water contact activities involving 624 exposures for a total of 9, 541 minutes were recorded (Table 1).

The primary activities recovered included fetching, washing farm produce, washing farm tools, washing clothes, washing limb, bathing, swimming and playing, fishing and baptism mean duration of individual contacts ranged from about one minutes of washing limb to more than 5 hours of fishing (Table1).

A breakdown of the 9, 541 minutes of total contact showed that 1070 (11.2%) were spent on personnel. (i.e washing limb, bathing). 752 (7.9%) on domestic (washing cloth and fetching) 1+36 (18.2%) on recreational (swimming and playing), 90 (0.9%) on religious (baptism) and 5893 (61.8%) on economic (fishing, washing farm produce and tools) contacts.

Also 440 of the 624 overall contacts involved partial exposures for 1815 (19.0%) minutes, 121 involved limited exposures for 5313 (55.7%) minutes and 63 complete exposures for 2413 (25.3%) minutes. Although the combined frequency of limited and complete exposures was only 29.5% of the total observed contacts both accounted for 81% of the total duration. Also of the 624 contacts males made 419 (67%) for 7533 (79%) minutes and females made only 205 (33%) for 2008 (21%) minutes.

DISCUSSION, CONCLUSION AND RECOMMENDATION

Water contact is vital for surviving in this village and therefore occupational activities were the main reasons for water contact especially for males, females had water contact mainly for domestic purposes. This close relationship between *S. mansoni* infection and agricultural activities were also reported in peri – peri (coura – filho et al., 1994).

Various studies investigated in area where schistosomiasis is endemic have revealed different patterns of water contact, effecting different patterns of life and different characteristic of available water bodies (Ofoezie et al., 2002)

Water contact pattern in this study area is age and sex related in earlier studies. It was reported that females made more contact with water (Ofoezie et al., 2002). However, in the this study, male dominated most contact activities in terms of frequencies and duration suggesting a higher tendency of infection among males in this study area. This is because most risky contacts in this study area were either economic or recreations in which more males were involved.

The difference in the male and females intensities of infection may reflect the degree of sensitization and host response to the invading parasites as well as the individual subject. And it is also a know fact that more women than men get more severe schistosomiasis infection due to Educational and Economic backwardness.

The recommended control measures for this village are: health education with emphasis on local risk factors for infection, creation of other leisure options and continuing. Periodical stool examination and mass treatments.

In conclusion, this is to generalized the effect of schistosomiasis which could be harmful to man, animal and its environment and it is also a known fact that schistosomiasis is a cog in the wheel of environmental emancipation more over, it is the duty of the Government and the Governed at the critical component of Nigeria’s vision 20:2020 policy to work harmoniously and conscientiously in other words pari-pasu to minimize the incidence of schistosomiasis in our environment.

THE RELATIVE IMPORTANCE OF DIFFERENT TYPES OF WATER CONTACT RECORDED IN AGBOR.

Activity	No of contact			Duration of contact			
	M	F	Total	Min	Max	Total	
Primary							
Fetching		89	8	97	1	5	170
Washing farm		26	67	93	1	59	1013
Produce							
Washing cutlass	1		7	8	10	150	582
Washing limbs		226	104	330	1	5	987
Bathing		11	4	15	13	10	83
Swimming and		33	13	46	12	116	1736
Playing							
Fishing		23	0	23	20	341	4874
Baptism		8	2	10	1	16	90
P-value				0.000 ¹			0.000 ⁴

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Total	419	205	624	1	341	9541
Purpose						
Personal	237	108	345	1	10	1070
Activity						
Domestic	90	82	105	1	120	752
Recreational	33	8	46	3	116	1736
Religions	8	7	10	1	16	90
Economic	51	0	18	20	341	5893
P – value			0.000 ²			0.000 ⁵
Total	419	205	625	1	341	9541
Degree						
Partial	309	131	440	1	13	1815
Limited	64	57	121	4	341	5313
Complete	46	17	63	2	120	2413
P – value			0.000 ³			0.000 ⁶
Total	419	205	624	1	341	9541

Result of one sample chi – square test for differences of contact, Kruskawallis test differences in duration between the different the different activities 1. $\chi^2 = 1251$ df =8, p=0.000, 2. $\chi^2=396.2$, df=4,p=0.000, 3. $\chi^2=396.2$, Df=2,p=0.000,4. $\chi=334.7$,p=0.000,5. $\chi=167.5$,0.0,6. $\chi^2 65$,p=0.000.

Table2
AGE AND SEX RELATED PATTERNS OF HUMAN WATER CONTACT AT AGBOR.

AGE GRP	TOTAL CONTACTS			TOTAL DURATION		
	M	F	TOTAL	M	F	TOTAL
0-4	0	1	1	0	6	6
5-9	0	1	1	0	5	5
10-14		14	52	815	340	1155
15-19	62	34	96	1433	583	16
20-	119	23	142	3402	301	3703
30-3	88	47	135	586	224	810
4	89	72	161	1203	494	1697
50-59	17	13	30	68	55	2123
60+	6	0	6	26	0	26
P-Value			0.000			0.000
Total	419	205	624	7533	2008	9541

Result of contingency test for differences in frequency of contact mamm-whitney test for differences in duration between males and females 1. $\chi^2=38.0$,df=8, p=0.000,2.2=-35,p=0.000.

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