QUESTIONNAIRE AS A TOOL FOR IDENTIFICATION OF HIGH RISK COMMUNITIES IN URINARY SCHISTOSOMIASIS RESEARCH

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ABSTRACT

A study of Schistosomiasis haematobium infection in all the fifteen primary schools in Agulu town, Anaocha Local Government Area of Anambra State, was conducted using questionnaire. Out of the fifteen schools, 7 had pupils with urinary schistosomiasis infection. Ten villages out of 20 in the town were indicated to contribute individuals that attend the 7 schools. Umuowelle Primary School ranked first with a positivity rate of 54.2 % for response "yes" to "blood in urine" and 40.3 % for "Bilharziasis/schistosomiasis". To rate the diagnostic performance of the questionnaire parasitological urine screening was also conducted in all the schools. The results showed that using questionnaire as a diagnostic tool is highly specific (87.5 %) and sensitive (87.5 %). Questionnaire administration was also shown to be cheaper, with a cost 7 times less than parasitological urine screening as well as being time saving. The diagnostic performance of the questionnaire was good in view of its preliminary screening function.

Key words: Questionnaire, Urinary Schistosomiasis, High risk situations, Rapid method

INTRODUCTION

Trematode infections of the genus Schistosoma are among the most widespread parasitic diseases of tropical and subtropical areas. The public health impact and the magnitude of the problem are evident from the information on schistosomiasis available from WHO (1993). Lester *et al* (1995) reported that *Schistosoma haematobium* is present in 44 African countries. Recent studies in Tanzania on the community diagnosis of urinary schistosomiasis (Lengeler *et al* 1991a, 1991b) have demonstrated that simple, self - administered questionnaire could be distributed , in a cost - effective manner through an existing and administrative system, and that their diagnostic performance for identifying high risk communities was very good. The studies were based on indirect interview approach because the researchers were not personally involved in the interviewing. This represented an alternative and simplified methodology for health interviews by eliminating the need for a face - to - face (direct) encounter between the investigator and the respondent. The present study will test this approach in Agulu town of Nigeria, West Africa. Moreover, in today's developing country contexts in which field research is conducted, often lack adequate facilities and trained personnel. Scientific rigour also requires that often, studies take too long to meet the immediate needs of disease control programmes. Thus, there is a need for a more rapid method of assessing high - risk situations or diagnosing urgent problems.

MATERIALS AND METHODS

The Study Area: The present study concentrates on *Schistosomiasis haematobium* in Agulu town in Anaocha Local Government Area (LGA), Anambra State, Nigeria where a lake implicated (Emejulu *et al* 1994) in the transmission of this disease is situated. Agulu is located between latitude $6^{o}06^{/}$N and Longitude $7^{o}03^{/}$E. coming from the South, the land is generally a steep dive towards the lake. The lake is fed partly from under ground and partly from a small inlet from across the bridge. It enjoys tropical type of climate. It is located the topography of the area promotes an even distribution of human population of relatively high density.

T**he Questionnaire:** The questionnaire (Table 1) was aimed at identifying the villages with urinary schistosomiasis. The questionnaire was not focused on schistosomiasis but on health and development problems of school children and their communities. This was to avoid a situation of respondents being influenced by the ideas they might already have had about schistosomiasis being a problem in the area or the personnel administering the questionnaire being tempted to select children for interview who they think might have schistosomiasis. The questions relevant to schistosomiasis are part of a list of several diseases and symptoms. A list of detailed instructions for the teachers was also attached to the questionnaire form (Lester, 1995).

Questionnaire Testing: The questionnaire was pre-tested using 2 primary schools in Onitsha town in Anambra State, Nigeria.

Table 1: Questionnaire relevant to health research in primary schools of Agulu town

Explanation: Put a mark √ for "yes" or a 0 for "no" and a dash – if the child does not remember or cannot answer. You have to answer the following questions. Each box is for only one child. If the boxes are not enough on one page, use the back. Return this sheet to the Head teacher. Thank you.

Name of school: _____ **Class:** _____

Pupils	1	**2**	3	4	5	6	7	8	9	10	11	12	13	14	15	16	→	x
Age																		
Sex (M/F)																		
Question 1: Which of the following symptoms did you experience during the last month?																		
Pupils	1	**2**	3	4	5	6	7	8	9	10	11	12	13	14	15	16	→	x
Coughing																		
Itching																		
Headache																		
Fever																		
Abdominal pain																		
Blood in urine																		
Blood in stool																		
Diarrhoea																		
Question 2: Which of the following disease did you experience during the last month?																		
Pupils	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	→	x	
Malaria																		
Diarrhoea																		
Skin disease																		
Eye disease																		
Bilharzias / Schistosomiasis																		
Respiratory infection																		
Worms																		
Abdominal problems																		

X = total number of pupil sampled

Table 2: Distribution and positivity rates of urinary schistosomiasis in primary schools in Agulu

School	Villages located	No. Interviewed	No positive for Blood in Urine (%)	No positive for Bilharzias (%)
Agunkwo P/S	Amaorji	70	0	0
Central P/S	Odidama, Obe	200	0	0
Chukwuka P/S	Uhueme,Ukunu	214	0	0
Community P/S	Umunowu	219	74 (33.8)	45 (20.5)
Ezeanyanwu P/S	Odidama,	223	0	0
Nwanchi P/S	Nwanchi	110	0	0
Obe P/S	Obe	233	5 (2.2)	1 (0.4)
Obeagu P/S	Obeagu	169	0	0
Onike P/S	Okpu	140	0 (0)	0 (0)
Practicing P/S	Nkitaku,	532	139 (26.1)	83 (15.6)
Udoka P/S	Ukunu, Isiamaigbo	189	9 (0)	0 (0)
Ugwuaba P/S	Umunifite	185	64 (34.6)	39 (21.1)
Umuowelle P/S	Umuowelle	201	109 (54.2)	81 (40.3)
Ifiteani P/S	Ifiteani	141	32 (22.7)	15 (10.6)
Nneogidi P/S	Nneogidi	186	52 (28.0)	34 (18.3)
Total		3029		

P/S: Primary School

This was to make sure that it sited the purpose and that the structure was adequate for the respondents who were also primary school pupils.

Administration of the Questionnaire: The questionnaires were taken to the Secretary of State Primary Education Board (SPEB) Anaocha Local Government Area, Neni, who had prior knowledge of the research. The Secretary then contacted the head teachers of the concerned schools. These head teachers collected the questionnaires from the SPEB Secretary on 14th Oct. 1999 and in turn instructed their teachers on what to do. Each class teacher was instructed to interview every child in the class and fill in the questionnaire based on the answers given by each pupil. The study was presented to the teachers as investigation of community problems and to the children as an overall health study. In all, fifteen primary schools with a total population of 3029 pupils were involved in the study.

During the survey, the Education Secretary was seen again after 1 week at the Local Government Headquarters to follow up progress and to resolve issues that arose. The head teachers of the various schools were also visited during the survey to monitor the progress. Within two weeks, the completed questionnaires were collected from the Education Secretary processing.

Because of the study design, no final consent could be obtained from the children or their parents; however, the issue was discussed with the head teachers through the Education Secretary.

Costing: The cost of transportation, equipment and other expenses were systematically recorded. The cost of teachers' working time in the assessment was not included since this was considered to be part of their duties within the frame work of the school health programme.

Data Analysis: Data were analysed using the method of Lester *et al* (1995).

Parasitological Urine Screening: All the 3029 children in the fifteen primary schools involved in the study provided urine samples. Samples of urine were collected between 12.00 am – 2 pm. This is the period for greatest egg output (Stimmel and Scott, 1956, Bradley, 1963). Visitation was made to each school on two different days of the week, except the Practicing School which was visited five times because it had over 500 pupils. The urine samples were processed using the sedimentation technique and the centrifugation method (McCullough and Magendantz, 1974). The samples containing ova were recorded. The financial cost, as well as days it took for the screening to be completed were noted and recorded so as to allow comparism with the questionnaire method.

RESULTS

Questionnaire Testing: All the children in 2 selected primary schools in Onitsha (a total of 2,281) children were questioned. The children's questionnaires were filled in properly. The teachers were of the opinion that the children had no problems with the questions and that they were not confused during the interview.

Response to Questions in the Study Area: A total of 3,029 children from 15 primary schools located within the 20 villages in Agulu town were interviewed. The children's questionnaires were all returned within 2 weeks. The male: female ratio was 1:0:94 while the mean age of the children was 11.0 years in each of the 15 schools. All the questionnaires were filled in properly.

Table 2 shows that 7 schools namely Umuowelle Primary School, Umunifite Primary School, Umunowu Primary School, Practicing Primary School, Nneogidi Primary School, Ifiteani Primary School and Obeagu Primary School out of 15 had individuals with positive answers for blood in urine and bilharzia / schistosomiasis. These 7 schools were attended by children from 10 villages out of 20 in Agulu town. Umuowelle Primary School ranked first for positive answers for blood in urine and bilharzia while Ugwuaba Primary School ranked second while Obe Primary School ranked 7th (Table 3). The remaining 8 schools after Obe Primary School had no positive answer and were thus ranked last (12th). In Table 4 more males 27.3% and 18. 6% respectively had positive answer for blood in urine and bilharzia / schistosomiasis than females which had 26. 8% and 16.6 % for the respective factors. However, this was not statistically significant (t = 2.17, df = 12) at 5 % level.

Table 3: Positivity rate ranking of primary schools (P/S) in Agulu with respect to schistosomasis

School	Percentage +ve blood in Urine	Percentage +ve Schisto / Bilharzia	Rank*
Umuowelle P/S	54.2	40.3	1
Ugwuaba P/S	34.6	21.1	2
Community P/S	33.8	20.5	3
Nneogidi P/S	28.0	18.3	4
Practicing P/S	26.1	15.6	5
Ifiteani P/S	22.7	10.6	6
Obe P/S	2.2	0.4	7
Obeagu P/S	0	0	12
Onike P/S	0	0	12
Agunkwo P/S	0	0	12
Central P/S	0	0	12
Chukwuka P/S	0	0	12
Ezeanyanwu P/S	0	0	12
Nwanchi P/S	0	0	12
Udoka P/S	0	0	12

** Based on the % of positive answers to the question "Did you have bilharz/schisto?*

Table 4: Positivity in relation to sex

School	No. of Male Interviewed	Number positive Blood in Urine / %	Bilhazia / Schisto %
Umuowelle P/S	92	51(55.4)	41 (44.6)
Ugwuaba P/S	108	33(34.0)	23(23.7)
Community P/S	108	36(33.3)	25?(23.1)
Nneogidi P/S	85	23(27.1)	17(20.0)
Practicing P/S	263	68(25.9)	43(16.3)
Ifiteani P/S	71	17(23.9)	8(11.3)
Obe P/S	135	4(3.0)	1(0.7)
Total	851	232(27.3)	158(18.6)
	No. of Female interviewed	**Blood in Urine %**	**Bilhazia /Schistoso %**
Umuowelle P/S	109	58(53.2)	39(35.8)
Ugwuaba P/S	88	31(35.2)	16(18.2)
Community P/S	111	38(34.2)	20(18.0)
Nneogidi P/S	101	29(28.7)	17(16.8)
Practicing P/S	296	56(20.8)	40(14.7)
Ifiteani P/S	70	11(15.7)	7(10.0)
Obe P/S	88	1(1.1)	0(0)
Total	836	224(26.8)	139(16.6)

The result of parasitological urine screening is shown in Table 5. Umuowelle Primary school had the highest number of 111 (55.2 %) of infected individuals followed by Ugwuaba Primary School with infection rate of 80 (43.2 %).

In comparism, only one egg count positive Obeagu Primary School out of 7 was classified wrongly as negative by the questionnaire (sensitivity, $^6/_7$ = 85.7 %) and only one egg count negative Obe Primary School out of 8 was classified wrongly as positive (specificity, $^7/_8$ = 87. 5 %). The positive and negative predictive values were 85.7 % and 87.5 % respectively.

Table 5: Distribution and prevalence rates of urinary schistosomiasis

School	No. Examined	No. Infected	% Infected
Agunkwo P/S	70	0	0
Central P/S	200	0	0
Chukwuka P/S	241	0	0
Community P/S	219	76	34.7
Ezeanyanwu P/S	223	0	0
Nwanchi P/S	110	0	0
Obe P/S	223	0	0
Obeagu P/S	169	7	4.1
Onike P/S	140	0	0
Practicing P/S	532	128	24.1
Udoka P/S	189	0	0
Ugwuaba P/S	185	80	43.2
Umuowelle P/S	201	111	55.2
Ifiteani P/S	141	33	23.4
Nneogidi P/S	186	55	29.6
Total	3029	450	16.2

Table 6: Operational features and cost-comparisons between questionnaire screening and urine screening

Approach	Questionnaire	Urine screening
Return rate (Coverage)	100%	100%
No. of school screened	15	15
No. of children screened	3029	3029
Total cost of approach N	2000	14,900
Cost per surveyed school	133.33	993.33
Cost per surveyed child	.66	4.92
No. of times cheaper than Urine filtration	×7	-
Screening time (weeks)	2	16

Costs were calculated for the questionnaire action and for screening by urine (egg count). Table 6 shows that the cost per surveyed school through questionnaire was ₦133.33, while urine screening was ₦993.33. Thus the questionnaire approach was 7 times less expensive than urine screening. The screening time with questionnaire was 2 weeks while urine screening took 16 weeks.

DISCUSSION

Schistosomiasis/Bilharzia positive schools according to the questionnaire screening were 7 out of 15 schools in Agulu town. These are attended by children from 10 villages viz: Umunowu, Nktitatu, Umubiala, Ifiteani, Obe, Nneogidi, Okpuifite, Amatutu, Umunifite and Umuowelle. This shows that through school positivity result, the endemic villages could be identified. This is in agreement with Jordan and Webbe (1982) who stated that the screening of school children is expected to give result that will represent the whole community since age-infection curves are similar in most setting where schistosomiasis is endemic.

The ranking of the school based on positive answer for blood in urine and bilharzias could provide basis for making decision about the communities that would require intervention and where the control measures should be carried out first. Jamison (1983) was of the opinion that such priority-setting will be affected by many considerations such as finance and time.

Due to the fact that it is not only schistosomiasis that brings about blood in urine, positivity rate for bilharziasis/schistosomiasis was used for most of the analysis. Higher positivity rate for blood in urine and bilharziasis was recorded in males than in females although this was not significant at 5% level (df=12). This could be as a result of more males visiting infected site.

For urine screening, just as with questionnaire study, Umuowelle Primary School recorded the highest prevalence rate followed by Ugwuaba Primary School. The schools identified with positive answers actually had *S. heamatobium* infected children except one school (Obeagu P/S) that had very low prevalence rate. Probably the positive children in this school had not started passing blood in urine as a result of few numbers of eggs in their bladder, thus the school was identified as negative school with questionnaire study. Also one negative school (Obe P/S) which was identified as a positive school by questionnaire may be as a result of female pupils menstruating during the period. The specificity and sensitivity rates as well as the negative and positive predictive values were thus high. Thus the diagnostic performance of the questionnaire was considered good in view of its preliminary screening function. The financial costs suggest that questionnaire method is more cost effective compared with screening using standard urine (10 ml) technique. Once the forms are printed, the necessary staff to executive the survey are already available at the schools through the help of the Education Secretary (ES) at the Local Government Headquarters. This is not the case for the parasitogical screening approach, which not only requires high financial and material outlay, but also involves the services of specialized teams of health workers.

The implication of the finding is that the questionnaire method gives mainly qualitative results and can therefore be used to single out rapidly and inexpensively high-risk and low-risk units. The parasitological screening of a large number of negative units can thus be avoided and available resources can be concentrated on the positive ones.

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