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THE PERCEPTION, BELIEFS AND PRACTICES TOWARD GENITOURINARY SCHISTOSOMIASIS BY INHABITANTS OF SELECTED ENDEMIC AREAS (EDO/DELTA STATES) IN SOUTH-EASTERN NIGERIA

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SUMMARY

Well-structured questionnaire on the perception, impression and response to genitourinary bilharziasis (Genitourinary schistosomiasis) was administered and explained in local languages: 'Igbo' 'Esan' 'Ezon' Itshekiri and Bini to 33815 inhabitants of selected endemic areas in south-eastern Nigeria from January, 1999 to December, 2001. Out of this number, 3815 (11.3%) were properly filled and returned. About 42.0% of the inhabitants admitted knowledge of the disease, while 14 (0.4%) knew about the aetiologic agent. About 181 (5.0%) who responded, admitted procuring treatment, while 100 (5.0%) declined to seek treatment of any sort. The relationships between water-bodies and human activities, and infection were well discussed. Amongst those who admitted knowledge of the disease but no knowledge of its etiologic agent, declined seeking treatment of any kind, but believe the disease is a natural phenomenon in ones developmental stage and therefore of no morbidity and mortality. Laboratory analysis of urine, faeces, semen and HVS was employed to assess questionnaire responses, and in some cases, physical examination was utilized to augment laboratory analysis in confirming urinal diagnosis. Haematuria was only directly related to egg count in the early part of life. Females were significantly haematuric and excreted more ova than males ($p < 0.05$). Headache (43.0%) and fever (31.0%) were major clinical signs while sexual pains (22.0%) were the least.

KEY WORDS: Genitourinary bilharziasis; Perception; Impression; Response.

INTRODUCTION

Urinary schistosomiasis (bilharziasis) is reported to be endemic in some parts of Borno State, Nigeria[14] with an average total prevalence rate of 12.3%. This is believed to be age-dependent, and *Bulinus globosus* and *Bulinus truncatus rhofsi* are discovered to be the intermediate hosts[13]. In some other parts of Nigeria with same ecological settings, these have been shown to be consistent[9,10,13]. Constrained as it may be to work out the best control measures and strategies suitable for the people due to customs and habits, concerted efforts are now being made in the direction of educational campaign enlightenment[14] on the dangers of epidemics. Other options being considered for harnessing include; improved access to health care and basic living conditions. Various studies by some other workers have shown common relationship between bilharziasis, water supply and human behaviour[2,12].

The prevalence of *S. haematobium* was influenced by an age-dependent and exposure to cercariae-infected water[14]. Bathing/swimming and fetching of water for domestic purpose readily predispose subjects to infection. Differences in these relationships due to cultural and socio-economic activities must be considered in any community-based control programme[3]. For a good recommendation to be made or suggested for a given community, it is pertinent to know how the inhabitants of that community perceive the disease and their responses due to the impression formed on those already infected. This has informed our study, and however, help to establish what the community knows about the infection, the aetiologic agent, transmission, treatment and control/prevention. This will in turn help one to test how readily or prepared the community would assimilate and embrace the unique control measures to be instituted later.

MATERIALS AND METHODS

Study areas: Following reports from the State Ministry of Health in Asaba and Benin, the capitals of Delta and Edo States, respectively on the status of urinary schistosomiasis, and the preliminary works in the Department of Zoology, Edo State University on this infection, we decided to carry out this study further between January, 1999 to December, 2001 so as to explain the reason for the spread by evaluating peoples' perception, impression, response and beliefs toward urinary schistosomiasis. Endemic areas were selected from the reports of the Ministry of Health and new endemic areas were identified from our previous studies and these were also included. Delta and Edo State of Nigeria are located between longitudes 5°00' E and 6°45' and latitudes 5°00'N and 6°30'N covers an area of about seventeen thousand and eleven square kilometres on land (17,011.00km^2); and longitudes 6°44'E and 6°43'E and latitudes 5°44'N 7°34'N, and covers about nineteen million six hundred and fifty six thousand and thirty five square kilometers on

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land (19656.35km^2) respectively (Fig. 1). Both states have forty-three (43, - Edo 18 and Delta 25) Local Government Areas (LGAs).

The communities in these local government areas are without potable pipe-borne water supply, and the inhabitants depend on the water-logged terrains scattered all over the areas for their domestic and economic water supply, which they compete with straying sheep and cattle. Farming is practiced at a very low subsistence level with food crops such as beans, yams groundnut and rice.

Well structured copies of questionnaire (Fig. 3) explained in local languages, was administered carefully from house to house amongst the inhabitants in the various Local Government Areas. The questionnaire was distributed with the help of health teams from each Local Government Area Health Department. Within the metropolis, the questionnaire distributed was coded in English language while those who could not read in English had the interpreted local language questionnaire given to them. Interpreters were assigned to those, who could not read nor write in either of the languages. Members of the Health team were indigenous and therefore served as local guides and recorders. The distribution was done in such a way that it cuts across all age groups, sexes and occupations. Responses were mainly by volunteers. Before this exercise was carried out, respective village/community heads, headmasters/headmistresses and principals of primary and secondary schools were consulted on the objectives of the study. Ethical permission was sought and gotten from the State Ministry of Health in both Edo and Delta States of Nigeria.

The questionnaire sought to obtain name, age, sex, previous residence, duration of stay in the present community, religion, occupation, history of anti schistosomal drugs, the existence of the genitourinary disease, and so on. The inhabitants in the communities were asked about the causative agent, evidence of awareness about infection and relationship between infection and water contact, fresh water snails and blood in urine. The questionnaire also sought to know those clinical symptoms the inhabitants considered to be signs of the disease, and information concerning water-related activities of the inhabitants. The inhabitants were asked of their perception, impressions and responses to the infection and their method of seeking treatment. Responses were confirmed through laboratory and clinical diagnosis from the urine, faeces, semen and high vaginal swab (HVS) for *S. haemotobium* ova. Physical examination was also carried out to confirm clinical diagnosis.

Laboratory analysis of urine, faeces semen and High Vaginal Swab (HVS): Permission and cooperation of the inhabitants were sought before collection of these samples. Inhabitants were enlightened on the purpose of the study and the public health implications of schistosomiasis, while the ethical permission to carry out this analysis was given by Irrua Specialist Teaching Hospital. Urine and semen samples were collected during the early periods of the day after 20-30 min physical exercise into 10 ml wide mouthed screw-capped plastic universal bottles. Plastic universal containers and swab sticks were used to collect faeces and HVS from those males and females respectively, who reported positive in their questionnaires. All the samples were collected by the participants while the long plastic swab stick was used by the health officers to collect exudates from the lower genital tract – LGT e.g. Cervix (squamous – columnar epithelium junction), vagina and vulva of the females. All samples collected each day were taken to the laboratory. Infection was confirmed by the presence of *S. haematobium* ova in the urine, faeces, semen or HVS. Each urine was observed for any visible macro haematuria and very turbid and haematuric urine sample was diluted with l75% normal physiological saline or phosphate buffered saline (pH 7.4) before ova count. Follow-up was done each month for the period of a year and six months and at each screening, samples were collected.

Visible haematuria was determined using one strip of commercially prepared reagent strip comb l9 (Macherey – Nagel, Ch. B Lot 32225), dipped into each urine sample and the colour change was matched with standard colours by the side of the container of the reagent strips. Urine samples were examined microscopically for *S. haematobium* ova using Nytrel filter, based on the method of WHO[17]. Urine samples were collected through a syringe filter holder (Swinnex type) containing a Nytrel filter; 12 mm in diameter, with a pore size of 20 µm. The chamber was opened and the filter was removed with forceps, placed on a glass slide and stained with a drop of 50% lugols iodine and examined under x40 light microscope. About a gram of the stool was suspended in 10 ml of 10% buffered formalin. The solution was poured through a two-layer gauze and left for 10 min. The sediments were resuspended and centrifuged for 2 min at 1000 rpm. The supernatant was discarded and pellet resuspended in 10 ml formalin. About 3 ml of ethyl acetate was added and the solution shaked vigorously for 30 sec, centrifuged for 2 min at 1000 rpm and the acetate debris water layer on top was discarded. WHO[16] technique of 50 mg Kato-Katz cellophane thick smear was employed. The presence of *S. haematobium* ova was examined after 48 h. The liquefied semen produced by masturbation and coitus interruptus and vaginal exudates were diluted with 75% normal physiological saline. About 0.25 ml of each was dropped on microscope slide and stained with 50% lugols iodine, examined under x 10 light microscope.

RESULT

Table 1 shows the respondents' perception of genitourinary schistosomiasis and the awareness of its aetiologic agent. One thousand, five hundred and eighty-nine, (42.0%) inhabitants agreed having the knowledge of urinary schistosomiasis amongst them. One thousand, and thirty-six 1036 (27.2%) of the inhabitants claimed to have been aware of the high prevalence rate, while 14 (0.4%) claimed to be aware of the correct aetiologic agent of the disease. Out of a total of 33815 questionnaires distributed, 3815 (11.3%) subjects responded.

Table 2 shows the respondents' reactions to genitourinary schistosomiasis. One hundred and twenty eight, 128 (3.4%) willfully had sought treatment in hospitals while 53 (1.4%) treated themselves at homes with traditional medications. However 100 (3.0%) did not seek treatment of any sort. One hundred and thirty-six, (4.0%) claimed to have been infected in the past one year, while 153 (11.30%) indicated of being currently infected. Of the 3815 (11.30%) that responded, out of which 1589 (42.0%) claimed knowledge of the disease, 368 (10.0%) accepted that they avoided coming in contact with water as a control measure. That is to say, they are aware that the aetiologic agent hails from water but are ignorant of that correct aetiologic agent.

Table 3 shows the respondents' relationship with water-bodies vis-a-vis their daily domestic activities. The most frequent domestic activity which leads the inhabitants having contact with water-bodies was the

Table 1
Respondents' perception of genitourinary schistosomiasis and the awareness of its aetiologic agent, amongst the 3815 residents in Edo and Delta States, administered with questionnaire (33,815)

Age groups (yrs)	No respondents	Aware that it is water related (%)	Perception of disease (%)	Aware of the correct aetiologic agent (%)	Aware of the level of prevalence (%)
5-9	453	NA(-)	10(2.2)	NA(-)	8(2.0)
10-14	512	NA(-)	18(4.0)	NA(-)	31(6.1)
14-19	526	NA(-)	195(37.0)	NA(-)	190(36.1)
20-24	311	92(30.0)	200(37.0)	5(2.0)	204(66.0)
25-29	262	64(24.4)	108(41.2)	2(1.0)	103(39.3)
30-34	182	72(40.0)	90(50.0)	6(3.3)	92(51.0)
35-39	213	81(38.0)	38(18.0)	1(1.0)	39(18.3)
40-44	312	65(21.0)	151(48.0)	NA(-)	92(30.0)
45-49	410	105(26.0)	232(57.0)	NA(-)	62(15.1)
50-54	382	122(32.0)	356(93.2)	NA(-)	105(28.0)
> 55	252	153(61.0)	192(76.2)	NA(-)	110(44.0)
Total	3815(11.3%)	754(20.0)	1589(42.0)	14(0.4)	1036(27.2)

NA = Not aware

Table 2
Repondents' reaction to geniotourinary schistosomiasis

Age groups (yrs)	No respondents	Treatment profile			Exposure to Infection		
		Nothing done (%)	Home treatment	Hospital treatment	Recent period of study (%)	Past/last 1 year (%)	*Control measures adopted (%)
5-9	453	-(-)	1(0.2)	2(0.4)	1(0.2)	3(1.0)	-(-)
10-14	512	11(2.2)	3(1.0)	9(2.0)	12(2.3)	11(2.1)	31(6.1)
14-19	526	50(10.0)	16(3.0)	31(6.0)	24(5.0)	18(3.4)	110(21.0)
20-24	311	21(7.0)	12(4.0)	10(3.2)	18(6.0)	19(6.1)	96(31.0)
25-29	262	12(5.0)	6(2.3)	41(16.0)	50(19.0)	38(15.0)	90(34.4)
30-34	182	1(1.0)	9(5.0)	13(7.1)	22(12.0)	17(9.3)	31(17.0)
35-39	213	5(2.4)	4(2.0)	22(10.3)	26(12.2)	30(14.1)	10(5.0)
40-44	312	-(-)	2(2.0)	-(-)	-(-)	-(-)	-(-)
45-49	410	-(-)	-(-)	-(-)	-(-)	-(-)	-(-)
50-54	382	-(-)	-(-)	-(-)	-(-)	-(-)	-(-)
> 55	252	-(-)	-(-)	-(-)	-(-)	-(-)	-(-)
Total	3815	100(3.0)	53(1.4)	128(3.4)	153(4.0)	136(4.0)	368(10.0)

- Cases not treated and no knowledge of control measures; * Avoidance of water related activities as control measures.

Table 3
Respondents' relationship with bodies of water as in their activities

Age groups (yrs)	No respondents	Bathing/swimming in stream (%)	Washing in stream (%)	Fetching of drinking water/ water for domestic chores (%)
5-9	453	13(3.0)	19(4.2)	20(4.4)
10-14	512	32(6.3)	41(8.0)	39(8.0)
14-19	526	219(42.0)	269(51.1)	300(57.0)
20-24	311	195(63.0)	200(64.3)	205(66.0)
25-29	262	112(43.0)	100(38.2)	91(35.0)
30-34	182	87(48.0)	80(44.0)	85(47.0)
35-39	213	35(16.4)	29(14.0)	31(15.0)
40-44	312	3(1.0)	10(3.2)	7(2.2)
45-49	410	2(1.0)	3(1.0)	4(1.0)
50-54	382	4(1.1)	2(1.0)	-(-)
> 55	252	2(1.0)	-(-)	-(-)
Total	3815(11.3%)	704(19.0)	753(20.0)	782(21.0)

constant fetching of drinking water, in which 782 (21.0%) of the respondents had indicated. This is followed by washing in stream 753 (20.0%), and bathing/swimming in stream 704 (19.0). However, there is no significant difference between these activities at $p > 0.05$. Respondents were observed to indicate more than one option.

Table 4 shows the age-specific prevalence of haematuria and ova in the studied population. Haematuria (60.0%) was recorded most within the ages of 5-14 years old. The presence of ova (66.0%), in the urine samples was also highest within these age bracket. The level of prevalence was significant between the age groups at $p < 0.05$. There is a linear relationship between haematuria and egg count within this age bracket. Beyond this, there was an inverse relationship.

Table 5 shows the sex specific prevalence of haematuria and ova in the responded studied population. The females had more haematuria (44.0%) and recorded more of the eggs (41.0%) in their urine samples than the males. The difference between sexes was significant at $p < 0.05$. A total of 2188 (57.4%) females responded out of a total of 3815 (11.3%) who correctly filled out their questionnaire. Out of this, 1426 (65.2%) were positive. A total of 1627/3815 (43.0%) males responded, out of which 668 (41.1%) recorded positive. Total response was 3815/33815 (11.3%) out of which 2519/3815 (66.0%) were positive, for both sexes.

Table 6 shows the age specific prevalence of some clinical signs observed by physical examination, confirmed by laboratory diagnosis amongst the studied population. Headache was observed and recorded to be the most occurring clinical sign (43.0%). This was followed by dysuria, fever, frequency of micturition ≥ 6 times/day, bloody urine and pains during and after sex with 42.0%, 31.0%, 26.3%, 24.0% and 22.0% respectively.

Table 7 shows the age-specific impression of 1426 positive female subjects, about their spouses having haematuria, dysuria and sexual pains. About 246 (17.3%) reported having no impression at all, while 21.0% and 20.12% recorded of the infection being part of human development and a natural phase in puberty respectively. About 137 (10.0%) reported of the infection leading to infidelity amongst the females immediately after contact on visiting the infected bodies of water, while 291 (20.4%) agreed that sickness ensues, i.e. haematuria is caused by water gods. However, 123 (9.0%) agreed that the sickness does not lead to divorce even when there is no child from the spouses.

Table 4
The age specific prevalence of hematuria and ova in the responded studied population

Age group (yrs)	Prevalence of haematuria (%)	Presence of *S. haematobium* ova (%)	Total No. positive
5-9	258/453(57.0)	282/453(62.3)	540
10-14	317/512(62.0)	350/512(68.4)	667
14-19	210/526(40.0)	289/526(55.0)	499
20-24	124/311(40.0)	166/311(53.4)	290
25-29	89/262(34.0)	118/262(45.0)	207
30-34	51/182(28.0)	58/182(32.0)	109
35-39	45/213(21.1)	11/213(5.2)	56
40-44	56/312(18.0)	6/312(2.0)	62
45-49	45/410(11.0)	-/410(0)	45
50-54	34/382(9.0)	-/382(0)	34
> 55	10/252(4.0)	-/252(0)	10
Total	1239/3815(33.0)	1289/3815(34.0)	2519

Table 5
Sex specific prevalence of haematuria and *S. haematobium* ova in the responded studied population

Sex	Prevalence of haematuria	Presence of *S. haematobium* ova (%)
Males	285/1627(18.0%)	383/1627(24.0%)
Females	954/2188(44.0%)	897/2188(41.0%)
Total	1239/3815(33.0%)	1280/3815(34.0%)

Table 6
Age-specific prevalence of clinical signs amongst the responded studied population (3815)

Age groups (yrs)	Fever (%)	Headache (%)	Pains during urination (dysuria) (%)	Frequency of micturition ≥ 6/day (%)	Colour of urine (bloody) (%)	Pains during/ after sex (%)
5-9	316(70.0)	319(70.4)	24(5.3)	10(2.2)	-(-)	-(-)
10-14	254(50.0)	300(59.0)	50(10.0)	12(2.3)	-(-)	2(0.4)
14-19	155(30.0)	192(37.0)	24(5.0)	10(2.0)	24(5.0)	-(-)
20-24	106(34.1)	126(41.0)	100(32.2)	25(8.0)	30(10.0)	94(30.2)
25-29	112(43.0)	153(58.4)	126(48.1)	98(37.0)	32(12.2)	118(45.0)
30-34	94(52.0)	118(65.0)	100(55.0)	84(46.2)	51(28.0)	100(55.0)
35-39	62(29.1)	124(58.2)	192(90.1)	112(53.0)	82(39.0)	91(43.0)
40-44	32(10.3)	110(35.3)	226(72.4)	104(33.3)	100(32.1)	150(48.1)
45-49	18(4.4)	96(23.4)	325(79.3)	182(44.4)	252(62.0)	87(21.2)
50-54	11(3.0)	65(17.0)	252(66.0)	193(51.0)	159(42.0)	122(32.0)
> 55	4(2.0)	38(15.1)	170(68.0)	172(68.3)	184(73.0)	69(27.4)
Total	1164(31.0)	1641(43.0)	1589(42.0)	1002(26.3)	914(24.0)	831(22.0)

Table 8 shows the age specific impression of 668 (41.1%) positive male subjects out of 1627 (43.0%) males who responded in the studied population on their spouses having haematuria, dysuria and sexual pains. Twenty-nine 29 (4.3%) of the positives showed *S. haematobium* eggs in their semen. Respondents' indicated 55.4% and 46.4% of their belief that, the infection is part of human development and therefore a natural phase in puberty respectively. Twenty-nine percent (29.0%) of the male respondents believed that the infection is caused by their gods of the rivers after visiting the bodies of waters at the early stage in ones life. This is an indication that one has grown. Twenty-one (3.1%) had the belief that, it becomes sickness if this puberty stage becomes associated with infidelity (7.2%).

Table 9 shows the occupational prevalence of urinary schistosomiasis amongst the subjects after laboratory analysis of their urine, faeces, semen and HVS samples. About 37.0% have primary school certificate while 50.0% of the subjects do not have any formal western education, however 3.1% and 1.0% have secondary and tertiary education respectively. About

Table 7
Age-specific impressions of 1426 positive female subjects out of 2188 in the studied population about their spouses having haematuria, dysuria and sexual pains

Age group (yrs)	No. of respondents by haematuria & ova	No. of impression (%)	Part of human development (%)	Anaemia (%)	Natural phase in puberty (%)	Sign of sickness (%)	Infidelity (%)	Sickness caused by gods (%)	Result to divorce (%)
5-9	216	175(81.0)	3(1.4)	-(0)	-(0)	10(5.0)	-(0)	4(2.0)	-(0)
10-14	218	29(13.3)	2(1.0)	-(0)	4(2.0)	72(33.0)	30(14.0)	-(0)	14(64.2)
14-19	416	42(10.1)	15(4.0)	-(0)	21(5.1)	2(1.0)	14(3.4)	10(24)	11(3.0)
20-24	262	-(0)	36(14.0)	-(0)	49(19.0)	-(0)	3(1.2)	26(10.0)	18(7.0)
25-29	120	-(0)	42(35.0)	-(0)	21(18.0)	-(0)	15(13.0)	22(18.3)	28(23.3)
30-34	47	-(0)	47(100.0)	-(0)	45(96.0)	3(6.4)	18(38.3)	31(66.0)	22(47.0)
35-39	31	-(0)	31(100.0)	-(0)	31(100.0)	-(0)	30(97.0)	31(100.0)	18(58.1)
40-44	27	-(0)	27(100.0)	-(0)	26(96.3)	-(0)	15(56.0)	11(41.0)	9(33.3)
45-49	45	-(0)	45(100.0)	-(0)	45(100.0)	15(33.3)	6(13.3)	18(40.0)	2(4.4)
50-54	34	-(0)	34(100.0)	-(0)	34(100.0)	2(6.0)	4(12.0)	20(59.0)	1(3.0)
> 55	10	-(0)	10(100.0)	-(0)	10(100.0)	4(40.0)	2(20.0)	10(100.0)	-(0)
Total	1326(65.2)	246(17.3)	292(21.0)	-(0)	286(20.1)	108(8.0)	137(10.0)	183(13.0)	123(9.0)

Table 8
Age-specific impression of 668 positive male subjects out of 1627 males in the studied population about their spouses having haematuria, dysuria and sexual pains

Age group (yrs)	No. of positive by haematuria & *S. haematobium* ova	Part of human development (%)	Anaemia (%)	No. Impression	Natural phase in puberty (%)	Sign of sickness (%)	Infidelity (%)	Sickness caused by gods (%)	Result to divorce (%)
5-9	92(14.0)	56(61.0)	-(-)	-(-)	48(52.2)	-(-)	28(30.4)	15(16.3)	32(35.0)
10-14	120(18.0)	15(13.0)	-(-)	-(-)	22(18.3)	3(3.0)	-(-)	23(19.2)	-(-)
15-19	65(10.0)	23(35.4)	-(-)	-(-)	38(59.0)	4(6.2)	2(3.1)	31(48.0)	-(-)
20-24	100(15.0)	51(51.0)	-(-)	-(-)	40(40.0)	2(2.0)	11(11.0)	9(9.0)	-(-)
25-29	46(7.0)	18(39.1)	-(-)	-(-)	25(54.3)	1(2.2)	-(-)	8(17.4)	-(-)
30-34	72(11.0)	32(44.4)	-(-)	-(-)	11(15.3)	-(-)	2(3.0)	10(14.0)	-(-)
35-39	38(6.0)	38(100.0)	-(-)	-(-)	18(47.4)	2(5.3)	1(3.0)	21(55.3)	-(-)
40-44	32(5.0)	32(100.0)	-(-)	-(-)	10(31.3)	3(9.4)	1(3.1)	15(47.0)	-(-)
45-49	58(9.0)	58(100.0)	-(-)	-(-)	54(93.1)	2(4.0)	2(4.0)	24(41.1)	-(-)
50-54	31(5.0)	31(100.0)	-(-)	-(-)	31(100.0)	3(10.0)	1(3.2)	26(84.0)	-(-)
> 55	14(2.1)	14(100.0)	-(-)	-(-)	13(93.0)	1(7.1)	-(-)	10(71.4)	-(-)
Total	668(41.1)	370(55.4)	-(-)	-(-)	310(46.4)	21(3.1)	48(7.2)	192(29.0)	32(5.0)

Table 9
Occupational prevalence of urinary schistosomiasis amongst the subjects by laboratory analysis of their urine, faeces semen and HVS samples

	Civil servant (%)	Trading(%)	Others(%)	Total(%)
Primary School	70(56.0)	214(47.0)	183(26.2)	467(37.0)
Secondary School	49(39.2)	84(18.4)	34(5.0)	167(13.1)
Tertiary School	6(5.0)	0(0.0)	0(0.0)	6(1.0)
None	0(0.0)	158(35.0)	482(69.0)	640(50.0)
Total	125(10.0)	456(36.0)	699(55.0)	1280

55.0% engage in other business such as hunting, farming and fishing as their chief occupation, while 10.0% are government workers or have engaged in other paid jobs outside government service. About 56% of those in paid civil service possess primary school certificate while 39.0% and 5.0% possess secondary and tertiary certificates respectively.

Fig. 1 shows the map of Nigeria indicating locations of Edo/Delta States.

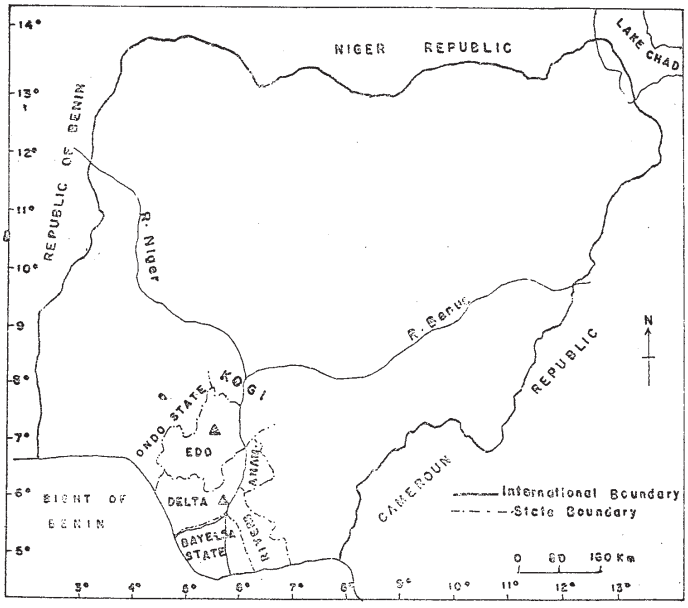

Fig. 1 - Map of Nigeria showing study location - Edo/Delta States of Nigeria.

Fig. 2 shows the respondents awareness of the relationship between infection, water-contact, fresh water snails and presence of blood in urine (haematuria). The awareness rose sharply from 12 years of age and peaked on the age-groups 19-24 years old, before declining.

Fig. 3 shows the details of the questionnaire administered.

DISCUSSION

The perception of the genitourinary schistosomiasis in some selected endemic areas in southeastern Nigeria is very high. One thousand, five hundred and eighty-nine (42.0%) of the respondents admitted having the knowledge of the existence of the disease and about 1036 (27.2%) indicated a high prevalence rate of disease. These findings contrasted with that of NDAMBA *et al.*[8] and ROBERT *et al*.[11] who had similar observations in Zimbabwe and Cameroun respectively. The former established an awareness of 80.0% in Zimbabwe, and respondents had no knowledge of the causative agent of urinary schistosomiasis. The lack of knowledge of the current aetiologic agent in this study is principally due to ignorance and illiteracy of the inhabitants as most of the inhabitants are peasant farmers without western education. An epidemiological map was prepared in Tanzania using the perception of schistosomiasis by inhabitants as a guide to diagnosis and control, and this may be equally useful in Nigeria[11]. This method can be used to determine and establish the public health status of the disease taking into consideration the whole population of Nigeria.

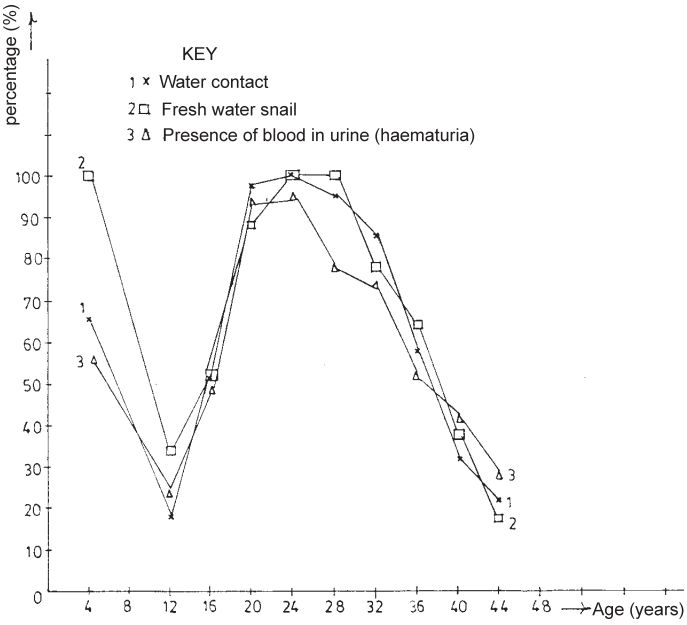

Fig. 2 - Respondents awareness of the relationship between infection, water-contact, fresh water snails and presence of blood in urine (haematuria).

The 42.0% awareness recorded did not reflect the treatment profile in which only 181 (5.0%) sought mediation. The 100 (3.0%) cases which were untreated may consequently lead to serious pathological abnormalities like bladder calcification, uteri stricture, hydronephrosis and eventually death. This has been described before by EDINGTON *et al.*[4] and CHUGH *et al.*[1]. The study has established 153 (4.0%) to have had the infection during the period of study. This is comparable to the earlier averaged prevalence of 12.3% recorded in Borno Sate[14] ($p = 0.05$).

Abstaining from water-bodies as one of the control measures was practiced by 368 (10.0%) and this is not reflected in the water-related activities of the inhabitants. Seven hundred and four (19.0%), 753 (20.0%) and 782 (21.0%) of inhabitants were involved in bathing/swimming, washing in streams and fetching of water from streams for various domestic reasons. The 10.0% degree of abstention could not have resulted in the high average rate of prevalence of 12.3% recorded earlier[14]. This directly presupposed that provision of potable pipe born water would drastically reduce the prevalence rate and intensity of the disease. But this would have to be militated against when you consider the main pre-occupation of rice farming being practiced largely by inhabitants.

The high prevalence of haematuria and presence of S. *haematobium* ova as we observed was evident within the age bracket of 5-14 years old. It can be suggested that, this possibility was observed because of the low response of the immune status of these age groups. However, presence of ova is linearly proportional to haematuria. Haematuria, later increased with decrease in ova output. However, immunology could have been used to explain this but we suggested the expense of bladder-tissue architecture UKWANDU *et al*.[15]. We believe that, haematuria was a result of much contraction of the bladder tissue in forcing urine out. Normal tissue architecture would have been lost due to calcification of the ova within the tissues. The degree of infection is high amongst the females

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QUESTIONNAIRE: STUDIES ON THE URINO-GENITAL SCHISTOSOMIASIS IN EDO/DELTA STATES

1. a) Name: .....
   b) Age: .....
   c) Sex: .....

2. a) Marital Status ..... Year (if married) .....
   b) No. of Children: .....

3. a) Religion .....
   b) State of Origin: .....
   c) Local Government of Origin: .....
   d) Occupation: .....

4. a) Nationality: .....
   b) Occupation: .....

5. a) Sources of Water Supply
   (i) River [ ]
   (ii) Streams [ ]
   (iii) Lakes [ ]
   (iv) Ponds [ ]
   (v) Dams [ ]
   (vi) Drainage [ ]
   (vii) Channels [ ]
   (viii) Seepages [ ]
   (ix) Springs [ ]
   (x) Swamps [ ]
   (xi) Paddy fields [ ]
   (xii) Others (specify) .....

   b) What purpose is the source

6. a) How many times do you visit this (ese) sources(s) per (i) day (ii) week, (iii) month.

   b) What hours of the day.

7. Do you have any knowledge of this specimen (snail)

8. Any
   (a) Fever,
   (b) Headache,
   (c) Pains during urination (dysuria),
   (d) Frequency of micturition
   (e) Haematuria
   (f) Colour of urine
   (g) Pains during/after sexual intercourse
   (h) Pains during menstruation
   (i) Duration of menstrual cycle (in days) .....
   (j) Duration of menstrual flow (in days) .....

9. What is the impression about children/adults having blood in urine (haematurial) as
   (i) part of human development [ ]
   (ii) a natural phase in puberty [ ]
   (iii) Sign of sickness [ ]
   (iv) Anaemia [ ]

   FOR MARRIED COUPLES

10. (a) What is the impression of your spouse toward dysuria
    (b) What is the impression of your spouse towards pains during and after sexual intercourse?
    (i) Any divorce
    (ii) Reasons
    (iii) Any relationship with 10 (a) or (b) above

11. Any case of sexual transmitted diseases (STDs)

12. (a) Any case of still birth/abortion
    (b) Any case of infertility
    (c) Any case of childlessness after marriage

Fig. 3 - Questionnaire administered.

than males and the reason for this was not immediately deduced, because both sexes have equal rate of visiting infected water bodies in this age group. Our further studies on immunopathology of genitourinary schistosomiasis may explain this later. Although HABERBERGER *et al.*[5]; and HAGAN *et al.*[6]; adduced low response from CD_8T–lymphocytes in females to be responsible for this.

The inter-relationship between infection rate, water contact, fresh water snails and the presence of blood in urine was very high amongst the age-groups of 15-20 years old. This has actually accounted and explained why there was a lower prevalence rate and intensity of infection seen in this age group in our previous study[14].

Dysuria and frequent micturition $\geq$ 6 times per day was recorded. The pressure applied on the bladder to squeeze urine out could have explained for dysuria and the low volume of urine voided out intermittently can explain for the frequency of micturition. The infection was observed to affect, although of little significance $p = 0.05$ the duration of menstrual flow and cycle. We could relate the occurrence of this infection with stillbirth, abortion, infertility and early stoppage of menstrual cycle. However, the preponderance of morbid effect of sexually transmitted diseases, largely due to secondary effects of bacterial action as a result of schistosomal legions, may be responsible for the morbidities observed above[1].

The study noted with disappointment, the impression given by few inhabitants that their condition was a stage in the course of their human development and therefore, it is a natural stage in the course of existence. They have learnt to live with it until it disappears on its own or they die with it. However, they do not believe in divorce even when there is no child. The opinions of 5-14 years age groups augment information from other age groups. This is because we used their opinions to ascertain the extent of tenacity which they hold their cultural beliefs. Infidelity scores for those who believe that the infection is not water related. It is to be

suggested that, advocating for the integrated method of control of urinary schistosomiasis[3,14]; for which mass educational enlightenment has been emphasized by UKWANDU & BUKBUK[14] in Borno State, especially which for now, has seemed inassimilable by few inhabitants, it can be assured that the high rate of perception would encourage understanding and compliance by this large number of inhabitants who perceive highly and would cooperate massively if the next step of mass chemotherapy using molluscicidal plant extracts on the intermediate host is advised.

RESUMO

Percepção, crenças e práticas sobre a esquistossomose genito-urinária de habitantes de áreas endêmicas selecionadas (Edo/ Estados Delta) no sudeste da Nigéria

Um questionário bem estruturado sobre a percepção e práticas e crenças sobre a esquistossomose genito-urinária foi administrado e explicado em dialetos locais: "Igbo" "Esan" "Ezon" Itshekiri e Bini a 33815 habitantes de áreas endêmicas selecionadas no sudeste da Nigéria, de janeiro de 1999 a dezembro de 2001. Deste total, 3815 (11,3%) foram preenchidos adequadamente e devolvidos. Cerca de 42,0% dos habitantes admitiram conhecer a doença, enquanto 14 (0,4%) conheciam o agente etiológico. Cerca de 181 (5,0%) dos que responderam admitiram ter procurado tratamento, enquanto 100 (5,0%) não procuraram tratamento de qualquer tipo. A relação entre as coleções de águas e atividades humanas e infecção foram discutidas. Entre os que admitiram conhecer a doença mas não o seu agente etiológico não procuraram nenhum tratamento, mas acreditam que a doença é um fenômeno natural nos estágios de desenvolvimento e portanto não apresentam morbidade e mortalidade. A análise laboratorial da urina, fezes, semen e HVS foi empregada para as respostas dos questionários e em alguns casos o exame físico foi utilizado para aumentar a análise laboratorial e confirmar o diagnóstico urinário. Hematúria foi diretamente relacionada a contagem de ovos na primeira parte da vida. As mulheres foram significativamente mais hematúricas e excretaram mais ovos que os homens ($p < 0,05$). Dor de cabeça (43,0%) e febre (31,0%) foram os maiores sinais clínicos enquanto dores sexuais (22,0%) foram os menores.

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REFERENCES

1. CHUGH, K.S.; HARRIES, A.D.; DAHNIYA, M.H. *et al.* - Urinary schistosomiasis in Maiduguri, north east Nigeria. **Ann. trop. Med. Parasit., 80:** 593-599, 1986**.**

2. DALTON, P.R. & POLE, D. - Water–contact patterns in relation to *S. haematobium* infection. **Bull. Wld. Hlth. Org., 56:** 417-426, 1978**.**

3. DAVIS, A. - Operational research in schistosomiasis control. **Ann. trop. Med. Parasit., 40:** 125-129, 1989.

4. EDINGTON, G.M.; von LICHTENBERG, F.; NWABUEBO, I.; TAYLOR, J.R. & SMITH, J.H. - Pathologic effects of schistosomiasis in Ibadan, Nigeria. I. Incidence and intensity of infection, distribution and severity of lesions. **Amer. J. trop. Med. Hyg., 19:** 982-995, 1970**.**

5. HABERBERGER Jr., R.L.; MOKHTAR, S.; BADAWY, H. & ABU–ELYAZEED, R. - *Chlamydia trachomatis* associated with chronic dysuria among patients with *S. haematobium.* **Trans. roy. Soc. trop. Med. Hyg., 86:** 671-673, 1993.

6. HAGAN, P.; WILKINS, H.A.; BLUMENTHAL, U.J.; HAYES, R.J. & GREENWOOD, B.M. - Eosinophilia and resistance to *S. haemotobium* in man. **Paras. Immunol., 7:** 625-632, 1985.

7. LENGEELER, C.; KILIMA, P.; MSHINDA, H. *et al.* - Rapid, low-cost, two step method to screen for urinary schistosomiasis at the district level: the Kilosa experience. **Bull. Wld. Hlth. Org., 69:** 179-189, 1991**.**

8. NDAMBA, J; CHANDIWANA, S.K. & MAKAZA, N. - Knowledge, attitude and practices among rural communities in Zimbabwe in relation to *Phytolacca deodecandra,* a plant molluscicide. **Soc. Sci. Med., 28:** 1249-1253**,** 1989**.**

9. NWAORGU, O.C. & ANIGHO, E.U. - The diagnostic value of haematuria and proteinuria: *Schistosoma haematobium* infection in southern Nigeria. **J. Helminth., 66:** 177-185, 1992.

10. OKAFOR, F.C. - *Schistosoma haematobium* cercariae transmission patterns in freshwater systems of Anambra State, Nigeria. **Angew Parasit., 31:** 159-166, 1990.

11. ROBERT, C.F.; BOUVIER, G. & ROUGEMONT, A. - Epidemiology of schistosomiasis in the riverine population of Lagdo lake, Northern Cameroon: mixed infections and ethnic factor. **Ann. trop. Med. Parasit., 40:** 153-158, 1989.

12. TAYO, M.A.; PUGH, R.N.A. & BRADLEY, A.K. - Water-contact activities in the schistosomiasis study area. Malumfashi Endemic Diseases Research Project, XI. **Ann. trop. Med. Parasit., 74:** 347-354, l980.

13. UKOLI, F.M.A. & ASUMU, D.T. - Ecological studies on snails in relation to the transmission of schistosomiasis and other snail borne disease in Kanji Lake, Nigeria. **Nig. J. nat. Sci., 2:** 59-68, 1980.

14. UKWANDU, N.C.D. & BUKBUK, D.N. - A study of the menace of urinary schistosomiasis (urinary Bilharziasis) in Borno State, Nigeria. **West Afr. J. biol. Sci., (i):** 31-37, 1996

15. UKWANDU, N.C.D.; NMORSI, O.P.G.; OYAKHIRE, G.K. *et al.* - The evaluation of non specific cellular immunological parameters amongst children with *Schistosoma haematobium* infection in Nigeria. **J. trop. Paediat., 47:** 260-265, 2001.

16. WHO - **Basic laboratory methods in medical Parasitology**. Geneva, WHO, 1991.

17. WHO - **Urine filtration technique for *S. haematobium* infection**. Geneva, WHO, 1983. (PDP/83.4).

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