

Prevalence of Urinary Schistosomiasis Infection among Women in Yala Local Government Area, Cross River State, Nigeria

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Abstract

Urinary schistosomiasis is endemic in Nigeria and continues to be a threat to public health especially for inhabitants of rural areas. Women in villages may be ignorant of the cause of the disease. The main source of water in these areas in most parts of Nigeria is the streams with resultant spread of schistosomiasis. This study was conducted to investigate the prevalence of schistosomiasis infection among women in Yala L.G.A in Cross River State, Nigeria. Macroscopy, urinalysis, and microscopy were used to examine the 650 urine samples collected from two villages (Ugaga and Okpoma) to determine presence of Schistosoma haematobium eggs. Questionnaires administered to women provided information on socio-demographic data and water-contact activities. Out of the 650 urine specimens examined in the two villages, 202 (31.08%) were infected with the highest prevalence found among the 11-22 years age group, and the least (12.80%) among the 59-70 years age group. Statistical analysis at significance level (P<0.05) revealed that there is a significant relationship between occupation and infection rate of schistosomiasis in the area. Schistosomiasis is of serious public health importance. Hence, the need for an acceptable preventive and control intervention to be carried out in this study area to reduce this problem.

Introduction

In Cross River State, urinary schistosomiasis has been reported in different Local Government Areas based on school-aged, pre-school children and adults in general with no information on women [6,4,1]. Consequently, most women in Yala Local Government Area were ignorant of this disease and a good number of them have never been diagnosed. Their main source of water is the stream, and bushes serve as their toilets [1], contributing to the subtle spread of schistosomiasis.

More Information

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This study was conducted to investigate prevalence of urinary schistosomiasis infection in women in Yala Local Government Area, Cross River State, Nigeria. **Materials and Methods**

Study area

This research was conducted in Yala Local Government Area of Cross River State in the Northern Senatorial District of Cross River State. Yala lies within latitude 6°50'N and longitude 8°50'E of the Equator. It has a total land area of 1739km² and a population of 210,843

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[8]. The climate is characterized by distinct wet and dry seasons. The temperature is uniform with a mean monthly average of about 27° C.

The major economic activities in the area are agriculture, fishing, mining, and trading. The major food crops produced are yam, cassava, beniseed (sesame) and maize [13].

Ethical approval was obtained from the State Ministry of Health, while the village Heads granted permission for the study.



Figure 1: Map of Cross River State Showing the 18 L.G. as Including the Study Area [12]

Parasitological survey

A total of 400 urine samples and 250 urine samples were collected from the women in Okpoma and Ugaga

villages, respectively during a two-month period. Ugaga is a smaller village compared to Okpoma. The urine samples (650) collected were examined using reagent strip (combi 9) and parasitologically for the presence of eggs of *Schistosoma*.

Questionnaire survey

A total of 650 questionnaires were administered to the women to obtain socio-demographic and individual history and knowledge of schistosomiasis infection. In Okpoma, 350 questionnaires were recovered. The 250 questionnaires that were administered in Ugaga were all recovered.

Comparison of prevalence by subjects' occupation and the infection was made using Chi square (X^2) test. Descriptive statistics including percentages and mean values were used to analyse data obtained from questionnaires. P values less than 0.05 were considered statistically significant [15].

Results

Questionnaire survey

Three hundred and thirty-six (56.00%) of the respondents were peasant farmers within age group 59-70 years with the highest prevalence of 96.05%, and the age group of 11-22 years had the least with 18 (10.71%). The traders accounted for 18.67% of all respondents with the age group 23-34 years having the highest percentage of 34.43%. Civil servants made up 2.17% with the age group of 47-58 years being the highest with 9.68%. The least number was found in the age group 23-34 years. The student respondents were 23.17% with the age group 11-20 years with the highest prevalence of 76.19% while the age group 23-34 years had the least with 9.02%. The summary of the individual occupations is presented in Table 1.

Age (Years)	No. Sampled	Farmers (%)	Traders (%)	Civil Servants (%)	Students (%)	
11-22	168 (28.00)	18 (10.71)	22 (13.10)	-	128 (76.19)	
23-34	122 (20.33)	66 (54.10)	42 (34.43)	3 (2.46)	11 (9.02)	
35-46	133 (22.17)	103 (77.44)	26 (19.55)	4 (3.01)	-	
47-58	101 (16.83)	76 (75.25)	19 (18.81)	6 (5.94)	-	
59-70	76 (12.67)	73 (96.05)	3 (3.95)	-	-	
	600	336 (56.00)	112 (18.67)	13 (2.17)	139 (23.17)	

Table 1: Occupation of Respondents in Yala Local Government Area

Respondents who had no formal education were 47.50% of total respondents with age group 59-70 years having the highest prevalence of 97.37% and the age group 11-22 years having the least of 5.95%. Respondents who had First School Leaving Certificate were 36.00%, with age group 11-22 years having the highest (68.45%) and the age group 59-70 years having

the least (2.63%). Those with Senior Secondary Certificate made up 14.50% with the highest percentage of 28.69% found in the age group 23-34 years and the least found in the group 47-58 years with a percentage of 1.98%. Summary of the individual literacy level is shown in Table 2.

Table 2: Literacy Level of Respondents in Yala Local Government Area

Age (Years)	No. Sampled	No Education (%)	Fslc (%)	Ssce (%)	Tertiary Education (%)
11-22	168 (28.00)	10 (5.95)	115 (68.45)	40 (23.81)	3 (1.79)
23-34	122 (20.33)	26 (21.31)	58 (47.54)	35 (28.69)	3 (2.46)



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35-46	133 (22.17)	93 (69.92)	26 (19.55)	10 (7.52)	4 (3.01)
47-58	101 (16.88)	82 (81.19)	15 (14.85)	2 (1.98)	2 (1.98)
59-70	76 (12.67)	74 (97.37)	2 (2.63)	-	-
	600(100)	28(57.50)	21(66.00)	8714.50)	12(2.00)

Women who responded positively to the use of stream as the source of drinking water were 71.67%, while 17.17% responded to the use of well, 10.17% borehole and 1.00% public tap. Use of stream had the highest percentage of 77.67% for water for other household use, and 13.17% for use of well, 8.83% for borehole and 0.33% for tap. This result indicates that the main source of water in the study area is the stream. Summary of sources of water results is presented in Tables 3.

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Age (Years)	No Sampled	Stream (%)	Well (%)	Borehole (%)	Tap (%)	Others (%)
11-22	168	115(68.45)	40(23.81)	10(5.95)	3(1.79)	-
23-34	122	92(75.40)	21(17.21)	9(7.34)	-	-
35-46	133	97(72.93)	15(11.28)	20(15.04)	1(0.75)	-
47-58	101	65(64.36)	18(17.82)	16(15.84)	2(1.98)	-
59-70	76	61(80.26)	9(11.84)	6(7.89)	-	-
	600	430(71.67)	103(17.17)	61(10.17)	6(1.00)	

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Water contact activities indicate that responses for the parts of their bodies that encountered water showed that 10.50% of the respondents came in contact with their legs, 19.00% with their hands, 16.00% with their whole body, and the highest percentage of the respondents (54.50%) said they come in contact with their hands/legs. The summary of the water contact results is presented in Figure 2.



Figure 2: Parts of the Body that Encountered Water

Parasitological examination Macroscopy

Macroscopy of the urine samples showed that 46.52% were red-brown and cloudy, 24.75% were brown-



cloudy, 27.72% were yellow and cloudy, and 1.00% were amber and clear, while none of the urine samples appeared pale yellow (0.00%).

Urinalysis

The reagent strip test showed that the overall prevalence of micro-haematuria at 1+ was 9.23%, at 2+ was 10.00% and at 3+ was 19.23% giving a total prevalence of 34.77% (i.e. 34.77% of the samples had micro-haematuria)

The overall prevalence for proteinuria at 1+ was 6.15% at 2+ was 6.92% and 3+ was 14.46% giving a total prevalence as 10.00% and the total of the overall prevalence as 23.08%.





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Microscopy

Microscopy showed that the highest prevalence rate was found among the age group 11-22 years with 48.11% and the least was found among the age group 59-70 years with 12.80%, while overall prevalence was 31.08%. This is presented in Figures 3 and 4, while the overall prevalence of schistosomiasis in both villages is presented in Figure 5.



Figure 4: Prevalence of *Schistosoma haematobium* Infection According to Age in Okpoma Village

Comparative analysis between the two villages shows that Ugaga had the highest overall prevalence (62.00%) within the age group 11-22 years. Also, the highest prevalence (86.25%) according to age brackets in both villages was obtained in the age group 11-22 years while the least prevalence was found in the age group 59-70 years with 31.03%. Okpoma had an overall prevalence of 11.75% with the highest prevalence found in the age group 11-22 years. Incidentally, the highest prevalence (19.05%) among the age brackets in Okpoma village was found in the age group 11-22 years and the least in the age group 59-70 years with 3.51%.



Figure 5: Overall prevalence of *S. haematobium* Infection According to Age in the Two Villages

Of those infected, farmers had the highest overall prevalence of 299 (46.00%) out of 650 (100%) samples examined. Among the age groups, 59-70 years age bracket had the highest prevalence (18.77%) while the least were civil servant with 0.20% within 23-34 years age group, as presented in Table 4.

AGE (years)	NO.	FARMERS	TRADERS	CIVIL	STUDENTS
	SAMPLED	(%)	(%)	SERVANTS	(%)
				(%)	
11-22	85	18 (2.77)	8 (1.23)	-	128 (19.69)
23-34	132	78 (12.00)	9 (1.38)	1 (0.20)	11 (1.69)
35-46	138	59 (9.08)	8 (1.23)	-	-
47-58	109	22 (3.38)	4 (0.62)	-	-
59-70	186	122 (18.77)	1 (0.20)	-	-
	650	299 (46.00)	30 (4.62)	1 (0.20)	139 (21.38)

Table 4: Prevalence of S. haematobium Infection According to Occupation

Discussion

The overall prevalence of urinary schistosomiasis in both villages revealed that Yala was high with 31.08% prevalence rate. This result is higher than 23.8% reported by[5] in Anambra State. The difference in results may be attributed to absolute dependence of the communities on natural water sources in the study area. The figure was much lower than prevalence rate of 91% in Otukwang, Obudu L.G.A, Cross River State Nigeria [9], whose investigation was among children. The reason for the variation in the prevalence between these two areas of study may be because of sociocultural and religious factors that expose females to activities at the infested water bodies, such as swimming, washing, and bathing, etc. These activities increase their rate of exposure to infection [14].

The prevalence of *S. haematobium* infection in Ugaga was higher with of 155 (62.00%) while Okpoma had 47(11.75%). This could be linked to the lack of potable water, poor toilet facilities in Ugaga village and since most of the people are rice farmers, which exposed them to the source of infection.



Highest prevalence among age brackets was recorded in the age group 11-22 years with 48.11% while the least prevalence was found in the age group 59-70 years (12.80%). This is like the work of [5] in Anambra State, where the age group 16-20 years had 50% prevalence rate, and this shows that the infection rate decreases with age.

The age group 47-58 years and 59-70 years also recorded a high prevalence in Ugaga with 16(41.08%) and 9(31.03%), respectively. This is contrary to previous study conducted by [7] and [3], where they presumed that the age-related changes in infection are mainly a combined function of immunity and water contact. Results obtained could be due to the low standard of living in the village and the fact that the highest percentage of farmers are found within these age groups. In addition, there is possibility that the elderly frequented the streams to take their bath, instead of sending the children to fetch water as reported by [7] and [3]; thereby exposing their bodies to infested water.

The highest prevalence by occupation was recorded among the farmers with 299(46.00%) as previously found in the study of [2] in Ebonyi, Benue River valley, southeastern Nigeria. Statistically, there is significant relationship between occupation and infection rate (P<0.05). The daily contact with the water for agriculture, domestic purpose and for recreational purpose increased the chances of the women of Ugaga and Okpoma getting infected, as 95% responded to fetching water daily and 80% responded to haven come-in-contact-with-water for agriculture, domestic and recreation purpose. This risk behavior agrees with the reports of [11] and [10] that there is a significant association between risk of infection and the number and duration of contact with infested water.

Conclusion

This study showed that urinary schistosomiasis prevalence of 31.08% obtained from both villages (Okpoma and Ugaga) in Yala L.G.A., Cross River State, suggests that it is endemic in the area. There is need for effective control programme. Although haematuria is a well-known sign of the disease in the study area, the very poor level of awareness of transmission of urinary schistosomiasis constitutes a problem.

There is need for combined efforts from the communities, educators, and health sectors to enlighten the people on the mechanisms of transmission. Although health education by itself cannot guarantee the effective control of schistosomiasis, it is a starting point around which other measures can be built to create a favourable environment for the promotion of higher levels of health consciousness. Provision of basic amenities like potable water supply, toilet facilities, etc., can improve the quality of life in endemic communities.

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Conflicts of Interest

The authors declare no conflict of interest. **References**

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