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Urinaryschistosomiasis in the Federal Capital Territory Abuja Nigeria

[1]Casmir I.C. Ifeanyi, [2]Benard M. Matur and [3]Nkiruka F. Ikeneche

[1]Department of Veterinary Microbiology, Faculty of Veterinary Medicine, University of Abuja, Nigeria
[2]Department of Biological Science, Faculty of Science, University of Abuja, Nigeria
[3]Department of Medical Microbiology, College of Health Sciences, University of Abuja, Nigeria

Abstract: Urinary schistosomiasis was investigated in the 6 Area Councils of the Federal Capital Territory (FCT) Abuja. Single urine samples were collectedfrom subjects aged 5 years and above between 1000 hours and 1400 hours were examined for the presence of *S.haematobium* eggs using centrifugation technique. Morbidity indicators of microhaematuria, proteinuria and urine nitrite was determined using reagent strips, macrohaematuria and turbidity as observed with the naked eye recorded. A total of 1,150 subjects comprised of 667 males and 483 females was studied. Out of the 1.150 subjects examined, 360 (31.3%) had the eggs of *S. haematobium* in their urine. Infection rates of urinary schistosomiasis varied from 25 to 36.3% between the area councils with the highest (36.3%) in Bwari area council. The geometric mean egg count (GMEC) was 43.8 egg per 10 ml of urine. The peak age of prevalence of urinary schistosomiasis (42.1%) was the age bracket of 10-14 years. The sex distributions of prevalence and intensity of urinary schistosomiasis measured by egg count per 10ml urine revealed that the infection was significantly more severe in females than males (P=0.001). The variation in prevalence between the FCT area councils showed that socio-environmental factors of playing/swimming was a common reason for contacting water is a high risk factor superseding fishing, washing Car and agricultural practices. This study depicted notable increase in the transmission and public health importance of schistosomiasis in the FCT Abuja Nigeria. Active intervention and implementation of control programmes was recommended.

Key words: Prevalence · Geometric mean egg count · Morbidity · Macrohaematuria · Microhaematuria

INTRODUCTION

Urinary schistosomiasis is highly endemic in Nigeria. It has been unsystematically reported and large areas remain whereas the disease status is unknown [1, 2]. The Federal Capital Territory (FCT) dubbed as conference tourism destination is adjudged the fastest growing and developing city in Africa has been among the least developed areas in Nigeria lacking in all forms of infrastructure and developmental amenity. The population of FCT which is increasing geometrically is difficult to ascertain in the absence of a recent census. The socio-environmental factors of migration, urbanization, population growth, impounding of water (dam construction) and agricultural practices an occupation of majority of its resident's, especially the indigenes are factors capable of breeding urinary schistosomiasis are very glaring in the FCT. The FCT Abuja Nigeria is situated in the North-central part of Nigeria. The FCT is located at latitude 9°13' North and longitude 7°09' East. The FCT has an area of 8,000 square kilometres comprised of municipal and sub-urban areas. It has 6 area councils namely: Abuja municipal (AMAC, Bwari, Kuje, Abaji, Gwagwalada and Kwali. [3]. Significant proportion of the FCT settlement areas still rely on streams and dams for water supply. It is tragic that the increasing transmission and public health importance of schistosomiasis has not resulted in active intervention and implementation of control programmes in the FCT Abuja Nigeria. Controls are initiated in countries where the public health importance of schistosomiasis is appreciated [4]. Presently, inadequate epidemiological and /or clinical data appear to support the prevalence of urinary schistosomal infections in FCT Abuja, Nigeria. The present study aimed to determine the socio-environmental factors, prevalence and morbidity indicators of urinary schistosomiasisin FCT Abuja, Nigeria.

Corresponding Author: Casmir I.C. Ifeanyi, Department of Veterinary Microbiology, Faculty of Veterinary Medicine, University of Abuja, FCT, Abuja, Nigeria, E-mail: ifeanyi.casmir@gmail.com.

MATERIALS AND METHODS

The study included 1,150 subjects both males and females aged 5 years and above recruited directly through surveillance out-reaches to district/village schools and health related institutions. Informed consent of adult subjects was obtained, while consent to obtain specimen from 'minors'/pupils was obtained through parents/guardian and the Education Department of the Ministry of the Federation Capital Territory (MFCT) Abuja. This study was to examine the terminal urine sample of individuals with or without signs of urinary disturbance and infection for evidence of Bilharziasis. The urine samples were collected between 1000 hours and 1400hours and were examined for colour, naked eye haematuria, turbidity and these observations were noted. Ten millilitres of urine were transferred aseptically into centrifuge tube and centrifuged for 5 minutes at 5000 rpm [2]. After discarding the supernant the entire sediment was transferred to a slide covered with cover glass and systematically examined using the 10x objective with the condenser iris closed sufficiently to give good contrast for red blood cells, pus cells (pyuria) and eggs of *S. haematobium* seen counted and reported per 10ml of urine [5, 6, 7]. Reagent strip urinalysis was performed using L-Combur reagent strip (Boehringer Mannhein).

RESULTS

The overall prevalence of urinary schistosomiasis was 31.1% (95% CI 26.2 - 36.4) in the Federal Capital Territory Abuja and ranged between 25 - 36.3% in the six area councils surveyed. The prevalence of infection was slightly more in Bwari area council 36.3% (Table1). Prevalence followed the typical age group pattern for urinary schistosomiasis attaining a peak 78.4% in subjects 10 - 14 years age, decreasing to 47.6% in subjects ≥ 50 years and lower in subjects within 20 - 39 year (Figure 1). Prevalence of urinary schistosomiasis was higher at all ages in males ranging between 0- 42.1% and in females 0 - 36.3% (Table 2). *S. haematobium* infection prevalence had a statistical significant difference between males and females at different age groups (x^2=48; P<0.001). The average intensity of infection according to age group and sex surveyed was 43.8 GMEC/10ml of urine (95% CI 29.8 - 57.8) and ranged from 1 to 95/10 ml of urine (Table 3). There is a significant difference in the geometric mean egg count (GMEC: x +1) between males and females (x^2=25.15; P<0.001). Intensity of urinary schistosomiasis infection followed similar age group pattern being higher in those between the ages of 15 and 19 years and lower in the very young (5-14 years) and those more than 25 years of age. Prevalence of urinary schistosomiasis

Table 1: Distribution and statistical test of significance of urinary schistosomiasis in the six area councils of FCT Abuja

Study Area	Number of Persons Examined	Number Infect with *S.haematobium*	Percentage Infected with *S. haematobium* %
AMAC	200	50	25.0
ABAJI	285	98	34.4
KUJE	160	40	25.0
KWALI	145	47	34.4
GWAGWA LADA	170	56	33.0
BWARI	190	69	36.3
X^2_{Cal}	9.8		
X^2_{Tab}	11.07		
Pvalue	0.125		
95% Confidence Interval (CI)	26.2 - 36.4		

Table 2: Distribution of the prevalence of *S. haematobium* infection in FCT according to age and sex; statistical test of significance between male and female

		Male			Female		
Age Group (Years)	Total Number Examined	Number Examined	Number Infected	Infected %	Number Examined	Number Infected	Infected %
5 - 9	213	93	30.00	32.3	120	21	16.7
10 - 14	557	378	159.00	42.1	179	65	36.3
15 - 19	200	90	30.00	33.3	110	27	24.5
20 - 24	50	38	5.00	13.2	12	2	16.7
25 - 29	29	19	3.00	15.8	10	1	10.0
30 - 34	34	13	2.00	15.8	21	3	14.3
35 - 39	22	12	1.00	8.3	10	2	20.0
40 - 44	20	8	3.00	37.5	12	1	8.3
45 - 49	15	9	2.00	22.2	6	1	16.7
>50	10	7	1.00	14.3	3	1	33.3
TOTAL	1150	667	236.00	35.4	483	124	25.7
X^2_{cal}	42	X^2_{tab}	18.25				

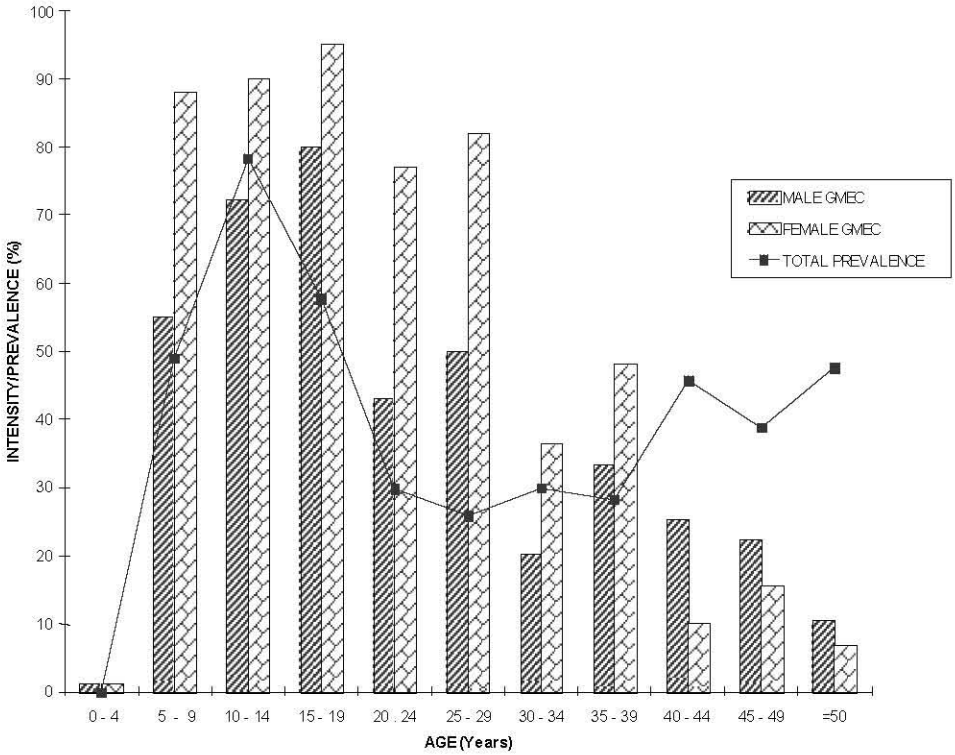

Fig. 1: Age and Sex preponderance of prevalence/intensity(GMEC) of *Schistosoma haematobium* infection

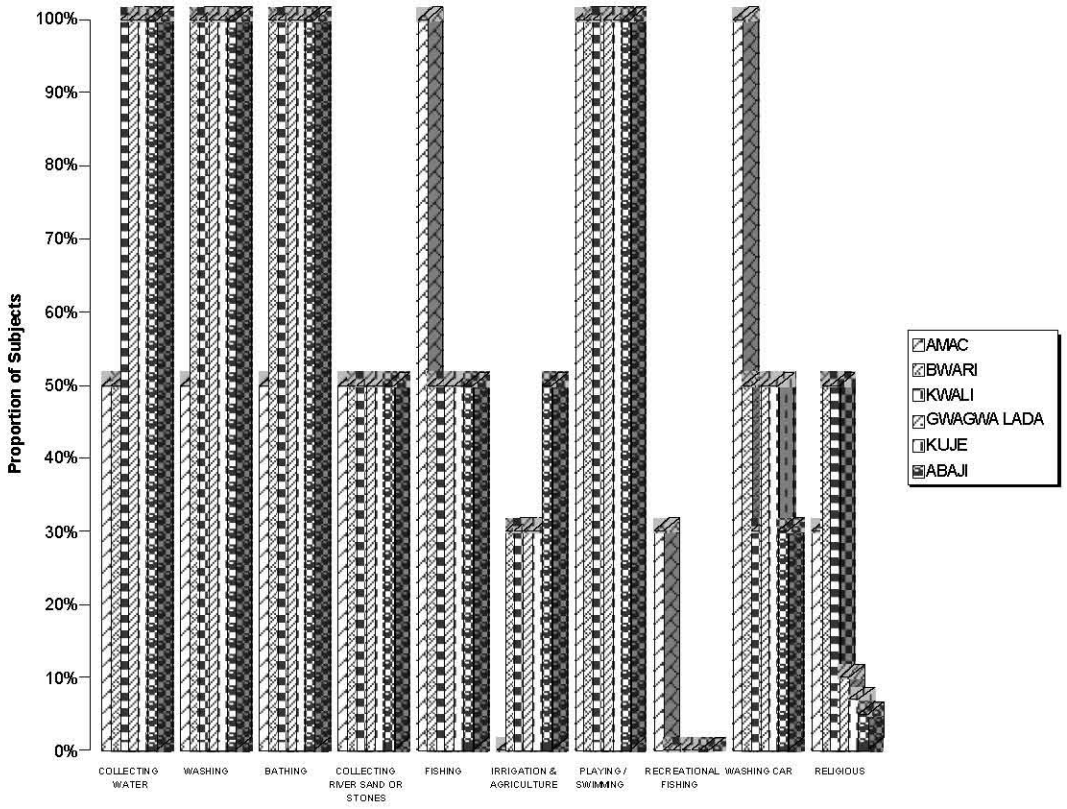

Fig. 2: Water contact pattern of subject in Federal Capital Territory, Abuja

Table 3: Distribution of geometric mean egg count (GMEC: X+1) and statistical test of significance between sexes

Age Group (Years)	5-9	10-14	15-19	20.24	25-29	30-34	35-39	40-44	45-49	≥50	Total
Male	55	72.2	80	43	50.1	20.2	33.3	25.3	22.3	10.4	411.8
Female	88	90	95	77.2	82	36.4	48	10	15.6	6.8	549
Total	143	162.2	175	120.2	132.1	56.6	81.3	35.3	37.9	17.2	960.8
X^2_{cal}	25.15										
X^2_{tab}	16.92										
Pvalue	<0.001										
Average Intensity (GMEC/10ml of urine)	48.04										
95% Confidence Interval (CI)	29.8 - 57.8										

Table 4: Contingency of Morbidity indicators of urinary schistosomiasis

	Number +Ve of 360 Examined		Percentage +Ve of 360 Examined	
Leucocytes Esterase > 25 Leu/ul	330		91.6	
PROTEIN = 30 MG/DL	350		97.2	
URINARY BLOOD = 10ERY/UL	336		93.3	
NITRITE POSITIVE	240		66.7	
X^2_{cal} 5.5	X^2_{tab}	11.03	*Pvalue*	0.05

infection was higher at all ages in males while intensity of infection was higher in females between the ages of 5 and 29years of age (Figure 1). The proportion of the subjects positive for ova of *S.haematobium* identified with morbidity indicators (Table 4) were statistically significant (x^2=11.03; P<0.05). Observed water contact pattern of subject studied in F.C.T. (Figure 2) revealed that playing/swimming was a common reason for contacting water in all the subjects. Fishing and washing Car remained a high risk factor in AMAC.

DISCUSSION

The findings of this study demonstrated that the overall estimated prevalence of urinary schistosomiasis as determined by ova in the urine is high (31.3%; 95% CI 26.2-36.4%). The average intensity of infection (GMEC) according to age and sex (43.8; 95% CI 29.8 - 57.8) was also high and significantly different (P < 0.05) compared to the recent report of Hamman *et al.* [9] with estimated prevalence of 4.8 ± 0.7% and intensity of infection (GMEC) 7 ± 0.55. The peak prevalence of urinary schistosomiasis (78.4%) was observed in age bracket of 10-14 years and was higher at all ages in males. There was a significant difference (P <0.05) in the sex distribution of prevalence of urinary schistosomiasis. This is attributable to the fact that within 10-14 years, males are very active and adventurous engaging in activities which necessitate more water contact. The group may even propagate the infection by urinating and defecating into stream. Variations in prevalence of urinary schistosomiasis between the Area Councils observed synchronized with water contact pattern of subjects in the FCT and it fulfil more than one of the specific reasons for water contact studies prescribed by Jordan and Webbe [8]. The water contact pattern in the FCT identified clearly that playing/swimming, superseded collecting water, washing, bathing, fishing and washing cars as common high risk activities. These activities are mainly domestic, recreational and some worth occupational activities peculiar to the peak prevalence age group 10-14 years in this study. This information will immensely help in evaluating control interventions such as health education aimed at reducing exposure. The higher intensity of infection in females is relatively incontrovertible considering the mutually inclusive factors of high volume of domestic chores and anatomically their short urethra in contrast to male urethra probably accounting for high rate urine egg excretion by. Recent researchers estimated prevalence of 29.4% in the Eastern Nigeria [2] and 57.4% in the West [1]. The result of this study is agreeable with these reports. Unequivocally, this finding suggested that the menace and diseases burden posed by urinary schistosomiasis in Nigeria is worrisome and remain obliterated by unsystematic reporting and hence unknown disease status.

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