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Urinary schistosomiasis among pregnant women in some endemic tropical semi – urban communities of Anambra State, Nigeria

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Abstract. Urinary schistosomiasis is caused by the deposition of eggs by adult flukes in the blood vessels surrounding the bladder of the infected host. Schistosomiasis is ranked the second most important parasitic disease of man and undoubtedly the most important of helminth origin. This paper reports the prevalence of *Schistosoma haematobium* infection among pregnant women in some endemic tropical semi – urban communities of Anambra State, Nigeria, screened using Medi-Test Combi 9 and urine centrifugation methods. Laboratory analysis of urine samples collected from 172 pregnant women indicated that 41 (23.8%) had urinary schistosomiasis with Anam community having the highest prevalence of 35.1% among other communities. The overall prevalence and intensity of infection among age groups showed that the youngest age group in the study, 16-20 years had the highest prevalence. Out of 24 women within this age group, 12 (50.0%) were infected among which 8 (33.3%) had light infection while 4 (16.6%) had moderate infection. The peak mean intensity of 7.6 eggs/10ml urine was observed in age group 16-20 years while the oldest age group, 41-45 years had the lowest mean intensity of 1.0 egg/10ml urine. Haematuria and proteinuria which are diagnostic for schistosomiasis were higher within age group 16-20 years in all the communities with Anam community having the highest prevalence of 50% for both biochemicals within age group 16-20 years. The findings from this study will be useful in developing specific programme for this special group of women.

INTRODUCTION

Urinary schistosomiasis caused by *Schistosoma haematobium* is a parasitic disease of the blood of mammals. The disease is caused by the deposition of eggs by adult flukes in the blood vessels surrounding the bladder of the infected host. Schistosomiasis is ranked the second most important parasitic disease of man and undoubtedly the most important of helminth origin (Ukoki, 1992). Engels *et al.* (2002) summarized the magnitude of schistosomiasis indicating that about 200 million people in 74 countries of the world are infected while about 500-600 million people are at risk of infection. Urinary schistosomiasis is prevalent in Africa and eastern Mediterranean (Allen *et al.*, 2001). It is also estimated that about 85% of all cases of this disease are in sub-Saharan Africa (Chitsulo *et al.*, 2000). In Nigeria, many rural communities in some states of the country are endemic for *S. haematobium* infection (Ekwunife & Okafor, 2004; Oladejo & Ofoezie, 2006; Uneke *et al.*, 2007). Among the individuals that are infected and suffering the consequences of this disease are pregnant women who naturally have immune compromised system. Based on this fact, it was considered necessary to investigate the prevalence and intensity of urinary schistosomiasis among this vulnerable group.

MATERIALS AND METHODS

The study area

The study area is situated between longitude 6°45" - 7°15"E and latitude 6°15" - 7°00"N. The semi- urban communities studied were Umuleri, Aguleri, Anam and Nzam, located in the lower Niger basin. The vegetation falls within the rainforest – savanna mosaic and the climate is tropical. Fishing and farming are the major occupations of these people.

Survey procedure

Prior to the collection of urine samples, ethical clearance and permission to conduct the study were obtained from Anambra State Ministry of Health, Nigeria. The consent of village Chiefs and Primary Health Care Officers were obtained.

Collection of urine

About 50ml each of urine samples was collected from 172 randomly sampled pregnant women attending ante-natal clinics in the studied community in a clean screw cap plastic bottle. Each urine sample was divided into two sub-samples. One sub-sample was used for rapid assessment of microhaematuria and proteinuria using Medi-Test Combi 9. Each reagent strip was dipped into urine sample and matched with colour chart on test strip container for detecting the presence and values of these biochemicals. Ten ml of the second sub-sample urine was centrifuged at 2000 rpm in a 15ml conical centrifuge tube for five minutes. The supernatant was thorough mixed with a glass rod and placed on a clean slide and examined under a light microscope for *S. haematobium* eggs. Urine samples containing 1 – 10 eggs/10ml urine was classified as light infection while 11 – 20 eggs/10ml urine as moderate infection.

Data generated were analyzed with SPSS version 14 in which intensity and prevalence of infection among communities and different age groups were assessed using means and percentages.

RESULTS

In the sampled tropical semi – urban communities of Anambra State, Nigeria, 41(23.8%) out of 172 pregnant women examined for urinary schistosomiasis were positive. Anam community had the highest (35.1%) prevalence, while the lowest prevalence was observed in Aguleri community (15.6%) (Table 1). The youngest age group 16-20 years had the highest prevalence (50.0%) with 33.3% of the infected individuals having light infection and 16.6% moderate infection. Only 1 (10%) individual had infection out of ten pregnant women examined within the age group of 41-45 years. Moderate infection was entirely absent from ages 31 to 45 years (Table 2).

The percentage of prevalence of haematuria and proteinuria by age and community of pregnant women studied indicated that age group 16-20 years had the highest prevalence of haematuria in the communities except in Umuleri community where age group 21-25 had a higher prevalence (30.7%) than age group 16-20 years (25.0%) and Anam community where both age groups, 16 – 20 years and 21 – 25 years had a prevalence of 50.0% respectively (Table 3).

Table 1. Prevalence of *S. haematobium* infection in pregnant women in Anambra State

Communities	Number examined	Number infected	Prevalence percentage
Umuleri	38	8	21.0
Aguleri	64	10	15.6
Anam	37	13	35.1
Nzam	33	10	30.3
Total	172	41	23.8

Table 2. Prevalence of urinary schistosomiasis by age of pregnant women in sampled communities in Anambra State

Age group	Number examined	Number positive	Prevalence percentage	Light	Moderate
16–20	24	12	50.00	8 (33.33)	4 (16.67)
21–25	57	12	21.05	9 (15.78)	3 (5.26)
26–30	40	9	22.50	7 (17.50)	2 (5.00)
31–35	28	5	17.86	5 (17.86)	0 (0.00)
36–40	13	2	15.38	2 (15.38)	0 (0.00)
41–45	10	1	10.00	1 (10.00)	0 (0.00)
Total	172	41	23.83	32 (18.60)	9 (5.23)

Table 3. Prevalence of haematuria and proteinuria by age and community of pregnant women

Community	Number	Haematuria						Proteinuria					
		16-20	21-25	26-30	31-35	36-40	41-45	16.20	21-25	26-30	31-35	36-40	41-45
Umuleri	38	25.00	30.77	11.11	0.00	0.00	0.00	25.00	23.08	0.00	25.00	0.00	0.00
Aguleri	64	37.50	19.05	13.33	0.00	0.00	0.00	25.00	14.29	0.00	0.00	0.00	0.00
Anam	37	50.00	50.00	33.34	33.33	0.00	0.00	50.00	41.66	37.50	25.00	0.00	25.00
Nzam	33	50.00	28.57	27.27	25.00	0.00	0.00	42.85	36.36	33.34	0.00	0.00	0.00

Table 4. Intensity of *Schistosoma haematobium* eggs/10ml urine of pregnant women by age and community

Community	Number examined	16-20	21-25	26-30	31-35	36-40	41-45
Umuleri	38	3.5±0.7	2.0±1.0	1.5±0.7	2.0±0.0	0.0±0.0	0.0±0.0
Aguleri	64	5.0±4.4	2.0±0.8	1.5±0.7	2.0±0.0	0.0±0.8	0.0±0.0
Anam	37	7.6±4.0	7.3±4.6	4.0±4.5	2.5±0.7	1.0±0.0	1.0±0.0
Nzam	33	5.3±5.2	5.7±3.8	3.5±0.7	3.0±0.0	2.0±0.0	0.0±0.0

In Aguleri community, proteinuria was not observed from ages 26 to 45 years and ages 31 – 45 years in Nzam community. A gradual reduction in prevalence of these biochemicals was observed as the age of the subjects increased (Table 3).

The mean intensity of *S. haematobium* eggs/10ml urine of infected pregnant women showed age dependent intensity. High intensities were observed among age group 16-20 years in all the communities with the highest intensity 7.6 ± 4.0 observed in Anam community while in older age groups, gradual diminution in intensity was observed (Table 4).

DISCUSSION

This survey clearly showed that urinary schistosomiasis is being transmitted in the studied areas as indicated by the overall prevalence. Moderately high prevalence of urinary schistosomiasis among pregnant

women observed in Anam community may be attributed to absolute dependence of the communities on natural water sources. This finding was in line with the observations of Olofintoye & Odaibo (2006) in Ilara community of Ekiti State Nigeria, where high prevalence of 29.1% was observed due to lack of alternative water supply apart from natural water bodies. Age related prevalence and intensity of infection were observed within this target group, with the youngest age group 16-20 years having higher prevalence and intensity in all the communities. The gradual decline in prevalence and intensity observed in older age groups conformed to earlier reports (Istifanus *et al.*, 1990; Arinola, 1995; Kabaterein *et al.*, 1999; Alozie & Anosike, 2004) where both prevalence and intensity of *S. haematobium* peaked at the second decade of life before declining in older cohorts. The mean egg out put among the pregnant women peaked within age group 16-20 years and dropped within age group 41-45 years. Age dependent immunity to *S. haematobium* had been shown to affect mean egg output of infected persons (Savioli *et al.*, 1990). The low mean intensity of *S. haematobium* eggs/10ml urine noted in this work in older age groups may therefore be due to acquired immunity and changes in water contact patterns.

The age related prevalence of micro-haematuria and proteinuria observed in this study, collaborated with the findings of Okpala *et al.* (2004) where this biochemical had higher prevalence in younger individuals than in older ones.

The ex-rayed status of *S. haematobium* infection was relatively high in the studied communities of Anambra State, Nigeria. This calls for urgent therapeutic intervention.

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