INTRODUCTION

In the tropics, urinary schistosomiasis due to *Schistosoma haematobium* causes untold hardship as a result of the associated morbidities. High mortality rate can occur as a result of complications arising from renal insufficiency and failure (Forsyth and Bradley, 1966). Some of these morbidities include hematuria, proteinuria and dysuria. This infection are present throughout sub-Saharan Africa (Jordan et al, 1993) and many foci of infections occur in endemic proportions (Bradley and McCullough, 1973; Chandiwana et al, 1988; Shaw et al, 1999). In rural communities, these endemcities are mainly due to some prevailing factors like lack of portable water supply, poverty, ignorance and poor environmental conditions.

The need for meaningful control of this parasitic infection has been stressed in the tropic. For this task to be achieved, the actual epidemiological mapping of *S. haematobium* infections must be first carried out in any country. Globally, this infection had been documented in 53 countries. The global prevalence showed that over 139 million people are infected with 85% of them occurring in Africa (Doumenge et al, 1987; WHO, 1999). In some parts of Nigeria, information exist in this regard (Ejezie et al, 1983; Osisanya et al, 1990; Udonsi, 1990; Adewumi et al, 1991; Anosike et al, 1992; Akonai et al, 1992; Arinola 1995; Useh and Ejezie, 1996). The uncovering of the infections in areas not previously reported (Nmorsi et al, 2001) are no doubt indication of the inadequacy of the information on epidemiology on this parasitic infections in Nigeria.

It is therefore hoped that the information in this present investigation which main objective is to establish the prevalence and aspects of morbidities of *S. haematobium* infection for the first time in these rural communities, will update and broaden the epidemiological picture of *S. haematobium* infections in Nigeria.

MATERIALS AND METHODS

This study took place in Ake-Ihievbu and Ihieve-Ogben; rural communities located in Owan East local government area of Edo State, Nigeria. The villages lies at 6°N and longitude 6°E within the rainforest belt of the state. Ake-Ihievbu has a population of 3,000 inhabitants while Ihieve-Ogben is made up of 2,500 vil-
lagers. These villages are 10 km apart. The villagers are predominantly subsistent farmers and few of them are civil servants.

The two communities lack pipe-borne water. There are streams and pools of water of varying sizes located in these villages which serve as the sources of water for their domestic and recreational purposes. Bulinus (Physopsis) globus and B. rohifsi; the snail intermediate hosts of *S. haematobium* abound around and within these streams and pools of water.

This investigation started by carrying out community mobilizing campaign on the significance of this study and the need for them to participate in the study. Pre-designed questionnaire on their personal data and morbidities like dysuria and supra public pain/discomfort were administered to the volunteers. These information were later analyzed. Between March 1999 and May 2000, 1,139 inhabitants comprising 702 from Ake-Ihievbu and 437 volunteers from Ihieve-Ogben participated in this study. The volunteers were asked to provide a single urine sample for examination in the wide-mouthed screw-capped 50 ml size container provided. The bottles were transported to Parasitology Laboratory of Zoology Department, Ambrose Alli University, Ekpoma for further procession. Hematuria and proteinuria were ascertained and documented using the simple reagent strips (Haemastrix® and Albustrix®, AMES Laboratories respectively). The urine samples were prepared for microscopic examination to identify the presence of *S. haematobium* ova in urine. The ova were counted and the intensity of infections were classified according to the method discribed by WHO (1983) as < 50 ova/10 ml of urine indicating light infection and ≥ 50 ova/10 ml of urine recorded as heavy infection.

The data were subjected to statistical analyses using chi-square test.

RESULTS

Of the 702 inhabitants examined in Ake-Ihievbu, 233 (33.2%) of them excreted *S. haematobium* in their urine. In Ihieve-Oben, 138 (31.6%), out of the 437 volunteers screened passed ova in their urine. The prevalence and intensities of the *S. haematobium* infections in both communities are presented in Table 1. The overall prevalence rate of urinary schistosomiasis in both communities is 32.6%. Light infection was reported among 270 (23.7%) while 101 (8.9%) of them had heavy infection. Children had higher prevalence rate than the adults and this difference was statistically significant ($\chi^2 = 27.0$, df = 3, $p < 0.05$). Among the adults, the civil servants had relatively lower infection rates than the farmers and this difference was statistically significant using chi-square test ($\chi^2 = 4.76$, df = 3, $p < 0.05$).

<table>
<thead>
<tr>
<th>Infected population intensity</th>
<th>Light infection &lt; 50 ova/10 ml urine</th>
<th>Heavy infection ≥ 50 ova/10 ml urine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>School children</td>
<td>159(40.1)</td>
<td>72(16.4)</td>
</tr>
<tr>
<td>Adults (i) Farmer</td>
<td>16(16.7)</td>
<td>17(11.6)</td>
</tr>
<tr>
<td>(ii) Civil servant</td>
<td>3(9.1)</td>
<td>3(11.5)</td>
</tr>
<tr>
<td>Total</td>
<td>178(33.8)</td>
<td>92(20.9)</td>
</tr>
<tr>
<td>Overall prevalent rate = 371/1,139=32.6%</td>
<td></td>
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</tbody>
</table>

Table 1
Prevalence of *S. haematobium* infection in Ake-Ihievbu and Ihieve-Ogben, Edo State, Nigeria.
Table 2
The prevalence of *S. haematobium* and the mean intensities of infection as expressed by ova/10 ml of urine in the two communities.

<table>
<thead>
<tr>
<th>Infected population</th>
<th>Infected population</th>
<th>Mean ova/10 ml of urine (≥40.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>School children</td>
<td>205</td>
<td>100</td>
</tr>
<tr>
<td>Adult (i) Farmers</td>
<td>23</td>
<td>37</td>
</tr>
<tr>
<td>(ii) Civil servants</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>231 (43.9%)</td>
<td>140 (22.8%)</td>
</tr>
</tbody>
</table>

Table 3
Prevalence and sensitivities of urinary symptoms found among 371 *S. haematobium* infected inhabitants in the two communities.

<table>
<thead>
<tr>
<th>Urinary symptoms</th>
<th>Prevalence (no.)</th>
<th>Sensitivities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematuria</td>
<td>292</td>
<td>78.7</td>
</tr>
<tr>
<td>Proteinuria</td>
<td>267</td>
<td>71.9</td>
</tr>
<tr>
<td>Dysuria</td>
<td>221</td>
<td>59.6</td>
</tr>
<tr>
<td>Supra public pain/discomfort</td>
<td>261</td>
<td>70.4</td>
</tr>
</tbody>
</table>

Table 2 shows the intensities of *S. haematobium* infections in both communities. The infected inhabitants excreted a mean of 40.1 ova/10 ml of urine. The males had higher prevalence rate of 231 (43.9%) than their female counterparts 140 (22.8%). Also this difference was statistically significant using chi-square test at ($\chi^2 = 40.53$, df = 2, $p < 0.05$). Among the children, the males had higher mean intensity of 69.9 ova/10 ml. The female farmers had comparatively higher mean intensity of 49.3 ova/10 ml than their male counterparts (12.0 ova/10 ml).

The mean intensity level of 40.1 ova/10 ml of urine was high when compared to the intensity level of <12 eggs/10 ml of urine recorded in Kano, Nigeria; (Betterton et al, 1988); in Somalia (Koura et al, 1981). The high levels of intensities of infection among school children with ≥ 50 ova/10 ml of urine should be considered of strong public health considering the fact that the egg counts reflects the worm burdens which has consequences in term of morbidities on the individuals. This observation was earlier documented.
The disparity in the pattern of the infection among the individuals of different occupational groups with school children having the highest infection rate and the least infections occurring among civil servants is principally due to exposure. Also the acquired immunity in older individuals in a community with schistosomiasis can possibly contribute to these differences (Woolhouse et al, 1991). Among the children, the females had relatively lower infection than their male counterparts. This observation is expected considering the fact that some socio-cultural factors like appearance of secondary sexual characters prevent these female children from visiting the infected streams and pools of water for recreational activities. This is in contrast to the adult females, who have higher water contact than their males because of their involvement in several domestic activities such as washing, fermentation of cassava tubers and even recreation. Some of the male inhabitants only visit the streams for the purpose of recreation as their farmlands are farther away from the streams.

The sensitivities of the urinary symptoms associated with \textit{S. hematobium} infections in the two villages screened were high. The high sensitivities for hematuria and proteinuria reported in this present study conforms favorably with the earlier report of (Gundersen et al, 1996). The association of these symptoms with urinary schistosomiasis had been documented (Nmorsi et al, 2001; Ekanem et al, 1995; Laven et al, 1998; Traquinho et al, 1998). These high sensitivities values reflect the usefulness of these urinary symptoms as morbidity indicators of \textit{S. haematobium} in an endemic village. However, it is worth mentioning that a combination of these symptoms may be more useful as indicators of morbidities than a single variable for purpose of rapid epidemiological mapping; an invaluable instrument for meaningful control in any wide endemic zone. For instance, Traquinho et al (1998) found the use of combined morbidity variables as dysuria and blood in urine as more useful morbidity markers in \textit{S. haematobium} infections. Also WHO (1993) earlier emphasized the use of reagent strips which provide data on hematuria and proteinuria in identifying cases of selected population chemotherapy.

This report is very crucial and relevant in planning control measures of schistosomiasis, as it will broaden the epidemiological picture of the disease in this part of the globe.

**REFERENCES**


Doumenge J, Mott KE, Chewng C, \textit{et al.} Centre d'


WHO. Urine filtration technique of Schistosoma haematobium infection. WHO PDP/83.4, 1983.

