A Survey of Urinary Schistosomiasis and Trichomoniasis in a Rural Community in Edo State, Nigeria

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Summary. Between October, 1999 and February, 2000, a survey of urinary schistosomiasis and trichomoniasis was carried among 830 inhabitants of Ikao Village, in Owan East local government area of Edo State, Nigeria. Of these, 178 (21.4%) excreted Schistosoma haematobium ova in their urine. School children were more infected than farmers and petty traders. Males were more infected than their female counterparts. These differences were statistically significant using chi-square test analysis (X2). Most of the inhabitants had light infections. In all, urinary schistosomiasis and trichomoniasis co-infection occurred in the genito-urinary tract of 14 (6.3%) female inhabitants. The highest Trichomonas vaginalis infection 16 (40.0%) occurred in female subjects within 20-25 years of age.

Key words—Urinary schistosomiasis, trichomoniasis, Schistosoma haematobium, Trichomonas vaginalis, rural community, rain forest belt, Nigeria.

INTRODUCTION

Schistosomiasis and trichomoniasis are important parasitic infections of the human genito-urinary tract, where they are associated with several known morbidities. Some of these morbidities include haematuria, proteinuria, and leukocyuria in schistosomiasis1. The ova of S. haematobium can be trapped in the lower genital tract to initiate genital schistosomiasis, which may cause lesions2 and other uropathy3,4,5. T. vaginalis may initiate inflammation of the genital tract couple with itching and copious whitish to greenish discharge. Complications such as infertility may occur6,7,8. There may be malignant transformation of the female cervix9.

Despite the unpleasant clinical realities of these infections, the actual epidemiological state of these diseases in this part of the globe appears uncertain. However, the estimate of schistosomiasis and trichomoniasis infections worldwide are about 200 million and 180 millions people, respectively10,11. Therefore, there is a need to intensify efforts to update information on the true epidemiological picture of these infections for any meaningful control of genito-urinary parasitic infections to be achieved in any country.

The purpose of this communication is therefore to report findings of a survey of urinary schistosomiasis and trichomoniasis in a rural community in a rain forest belt of Edo State, Nigeria, aiming to enhance existing epidemiological data on these genito-urinary parasitic infections in this part of the globe.

MATERIALS AND METHODS

This study was carried out in Ikao Village, a rural settlement located in the Owan East Local Government Area of Edo State, Nigeria. The village is located at latitude 6° N and longitude 6° E within a rain forest belt of the state. Ikao Village has a population of about 2000 of predominantly farmers and hunters, though a few residents, especially women, are involved in petty trading within their neighbourhood. This study was carried out between October, 1999 and February, 2000. A stream flows through the village. S. haematobium snail hosts, Bulinus (Physopsis) globosus and B. rohifsi, abound around and within this stream into which the snails...
excrete cerceriae. The villagers visit this stream for their water supply and recreational activities, thus exposing themselves to their main route of infection with *S. haematoobium*.

This study commenced by mobilizing the villagers and educating them on the relevance of this study. After this community mobilization campaign, 830 volunteers were subjected to further parasitological investigations. The information on their sex, occupation, and genito-urinary symptoms such as dysuria, supra-pubic/discomfort were obtained by a pre-designed questionnaire.

The mid stream urine were collected from the volunteers between 11.00 and 13.00 GMT with a wide-mouthed screw-capped 50 ml size container. These bottles were immediately transported to the parasitological laboratory of the Zoology Department, Ambrose Alli University, Ekpoma, for further processing. The processed urine was screened for the ova of *S. haematoobium*. The ova were counted. The intensity of infection using the ova count was classified according to the method described by 12 as follows: light infection accounting for < 50 ova/10 ml of urine, and heavy infection for ≥ 50 ova/10 ml of urine. Haematuria were recorded visually and using Haemastik (Bayer) reagents strips.

Wet preparations of the high vaginal swabs collected from 222 female volunteers, especially those who complained of itching and abnormal vaginal discharge, were made and examined microscopically for the presence of *T. vaginalis*.

### RESULTS

The prevalence and intensities of *S. haematoobium* among the occupational groups of the inhabitants investigated are presented. One hundred and seventy-eight (21.4%) of the entire 830 villagers examined excreted *S. haematoobium* ova in their urine. The male school children had more infections than the farmers and petty traders. Also, the males had both higher light infection (16.9%) and heavy infection rates (8.2%) than their female counterparts, who showed (13.0%) and (4.8%) respectively. This pattern of infection was statistically significant $X^2 = 4.83$; df = 3; $P < 0.05$. Generally, more inhabitants 124 (14.9%) had light infections as manifested by the presence of less than 50 eggs per 10 ml of urine (Table 1).

The pattern of the urine symptoms found among *S. haematoobium* infected inhabitants are shown in Table 2. The sensitivity of haematuria (75.3%) was higher

### Table 1. Prevalence and intensities of urinary schistosomiasis among inhabitants examined at Ikao Village

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Population Examed</th>
<th>Intensity</th>
<th>Light Infection (&lt;50 ova/10 ml)</th>
<th>Heavy Infection (≥50 ova/10 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male No (%)</td>
<td>Female No (%)</td>
</tr>
<tr>
<td>School children</td>
<td>236</td>
<td>204</td>
<td>44(18.6)</td>
<td>28(13.7)</td>
</tr>
<tr>
<td>Farmers and Petty Traders (Adult)</td>
<td>178</td>
<td>212</td>
<td>26(14.6)</td>
<td>26(12.3)</td>
</tr>
<tr>
<td>Total</td>
<td>414</td>
<td>416</td>
<td>70(16.9)</td>
<td>54(13.0)</td>
</tr>
<tr>
<td>Grand total</td>
<td>830</td>
<td>124</td>
<td>14(9.3)</td>
<td>54(6.5)</td>
</tr>
</tbody>
</table>

### Table 2. Prevalence of urinary symptoms in *S. haematoobium* infected inhabitants

<table>
<thead>
<tr>
<th>Urinary symptoms</th>
<th>Light infection</th>
<th>Heavy infection</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematuria</td>
<td>98(79.0)</td>
<td>36(66.7)</td>
<td>134(75.3)</td>
</tr>
<tr>
<td>Dysuria</td>
<td>35(56.5)</td>
<td>30(55.6)</td>
<td>65(36.5)</td>
</tr>
<tr>
<td>Supra-pubic pain/discomfort</td>
<td>46(37.1)</td>
<td>16(29.6)</td>
<td>62(34.8)</td>
</tr>
</tbody>
</table>
than dysuria (36.5%) and supra pubic pain/discomfort (34.8%). All individuals with these urinary symptoms excreted S. haematobium ova in their urine. The urinary symptoms were not observed among inhabitants without urinary schistosomiasis.

Twenty-four (10.7%) female volunteers harboured T. vaginalis in their genital tract. Of these, 14 females had both S. haematobium and T. vaginalis infections. Ten inhabitants had trichomoniasis without urinary schistosomiasis. The highest infection rate 16 (40.0%) was observed among female inhabitants in the 20-25 year age group (Table 3).

**DISCUSSION**

The presence of S. haematobium ova in the urine of one hundred and seventy eight (21.4%) inhabitants depicts the hypendemicity of an infection. This area falls into the category considered to be with moderate transmission. This study collaborates earlier investigations made by in Ibadan, Nigeria and in Sokoto, Nigeria. Also, the present investigation agrees with the reports by earlier workers that male school children show higher egg excretion than their female counterparts. This pattern of infection can be attributed to exposure factors because the absence of portable drinking water compels these children—especially males—to visit the infected stream for their water supply. This reason as well as the visit to this infected stream for recreation especially after farm activities are responsible for the males having more light and heavy infections than their female counterparts. This implies more water contact, and the net effect is more infections. The social factors arising from the appearance of secondary sexual characteristics often create some restrictions on their female counterparts from visiting the stream as regularly as the males. Exposure factors as well as the high acquired immunity could be advanced for this propensity of infection towards the children rather than the adults, who are predominantly farmers and petty traders.

Halt et al. earlier indicated that uropathy is significantly associated with egg counts and haematuria at individual levels. Also, haematuria is frequently associated with S. haematobium infections. Therefore, haematuria is regarded as a good marker for the morbidity of urinary schistosomiasis in any community. This assertion is further proved valid by the observation made in this present study where haematuria had the highest sensitivity rate of 75.0% when compared with other urinary symptoms, namely dysuria and supra pubic pain/discomfort with relatively lower sensitivity values. Therefore, it implies that these urinary symptoms which have been documented earlier may not be very good indicators of urinary schistosomiasis when compared with haematuria at the community level in Ikao, Nigeria. It is worth mentioning that such urinary symptoms as the dysuria, haematuria, suprapubic pain recorded in this study are also implicated in other urinary tract infections caused by microbes like Escherichia coli, Klebsiella, staphylococci, Neisseria gonorrhoeae e.t.c. Chills, fever, costovertebral tenderness, nocturia, arthralgia and myalgia are involved. An interesting distinction between urinary schistosomiasis and urinary tract infections is that symptoms of urinary tract infections are often vague, infrequent, and inconsistent and there are usually no S. haematobium ova in the urine. However, strong epidemiological significance is evidenced by the presence of S. haematobium ova in the urine of individuals with these urinary symptoms in this present study. Also, the absence of these urinary symptoms among individuals without urinary schistosomiasis can no doubt support the fact that persistent dysuria, haematuria, and supra pubic pain/discomfort are associated with urinary schistosomiasis in the rural settlement investigated.

The occurrence of T. vaginalis among individuals in a schistosomiasis infected zone and in a rural settlement where health education is scanty and ignorance prevails should be a public health concern despite the low level of the endemities of these infections. Also, the occurrence of highest T.

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**Table 3. Prevalence of T. vaginalis infection according to age group**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total individuals Examined</th>
<th>Infected population</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20</td>
<td>62</td>
<td>23(3.2)</td>
</tr>
<tr>
<td>21-25</td>
<td>40</td>
<td>16(40.0)</td>
</tr>
<tr>
<td>26-30</td>
<td>34</td>
<td>6(17.6)</td>
</tr>
<tr>
<td>31-35</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 36</td>
<td>68</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>224</td>
<td>24(10.7)</td>
</tr>
</tbody>
</table>
infection of the genito-parasitic infections, it is important in the maintenance and propagation of infections appear slow, the results of this type of through proper and swift treatment of the inhabitants, health education especially through the practice of safe sex by use of condoms in T. vaginalis, and the provision of adequate and portable water supplies for urinary schistosomiasis. Having implicated a co-infection of these genito-parasitic infections, it is imperative to incorporate control of T. vaginalis into urinary schistosomiasis control, especially for the health benefits of the rural inhabitants.

REFERENCES


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