SCREENING FOR SCHISTOSOMA HAEMATOBIAUM INFECTION IN A RURAL COHORT OF PREGNANT WOMEN IN NIGERIA

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Studies were conducted to investigate the occurrence of Schistosoma haematobium infection among 37 pregnant Nigerian women in Ile, Osun state, Nigeria and to determine the effects on haemoglobin concentration and clinical symptoms. Out of the 37 pregnant women seen over a period of nine months, 14 (37%) had urinary schistosomiasis, with a mean egg count of 825 eggs/10 ml of urine. The mean haemoglobin values in women with schistosomiasis were lower than in women negative for the parasite but the differences were not statistically significant (P > 0.05). Abdominal pain was the predominant complaint among the women seen with 71% of the infected women while other complaints were diarrhoea, fever and headache. This study shows that schistosomiasis is prevalent among pregnant women in rural areas and could contribute to anaemia and abdominal pain commonly seen in pregnant women in our environment.

Key words: Schistosomiasis, Pregnant women, Abdominal pain, Haemoglobin values, Nigeria

INTRODUCTION

Schistosomiasis is endemic in 74 countries and infects more than 200 million people worldwide (1). As a result of this parasitic infection with genitourinary tract infection with renal complications, and salpingitis and tubal obstruction that can lead to infertility and ectopic pregnancy (2). In sub-Saharan Africa, up to 24 million women may be pregnant each year and this high rate is often associated with increased susceptibility to infections because pregnancy is accompanied by high hormone activity which may exert immuno-suppressive effects (3).

Schistosomiasis, along with other helminthic infections, is a common occurrence particularly in rural areas of Nigeria and some studies have reported the relationship between schistosomiasis during pregnancy and tubal obstruction, anaemia, low birth weight and acute appendicitis (4-7). For example the prevalence of hookworm infection among pregnant women has been estimated to be 32% (8). Given the high fertility rate, low nutritional status and poor hygienic conditions predominant in developing countries, schistosomiasis during pregnancy may contribute significantly to adverse pregnancy outcome.

The occurrence of schistosomiasis in pregnant women in Nigeria, their clinical manifestations and the disease association are largely unreported. This study serves as a preliminary investigation of prevalence and clinical effects of Schistosoma haematobium infection among pregnant women in a rural area of Nigeria.

MATERIALS AND METHOD

Subjects/Study area

The subjects were pregnant women visiting the antenatal clinic (ANC) of Ille health post of Olorunda Local Government area of Osogbo, Osun State, Nigeria between May 2002 and January 2003. Ille is a very small community with a population of about 3000 people. The women are Nigerians of the Yoruba ethnic group, who have been residing in the community for at least 5 years. The people of the community depended largely on a very close by stream for almost all their water

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related activity. The purpose of the study was explained to the women and informed consent was sought. Only 37 women who consented were recruited to participate in the study.

**Sample collection/examination**

Urine samples were collected from the women into a universal bottle. Ten mls of urine was centrifuged at 2,500 rpm and the sediment was examined for eggs of *S. haematobium* using the sedimentation technique (9). The frequency of macroscopic haematuria was recorded. The presence of microscopic haematuria was confirmed using the Medi Test strip (Combi 9, Mcherey-Nagel Dueren) and the concentration was recorded as 10, 50 or 250 Ery/μL of urine. The haemoglobin concentration was evaluated using iron determination technique (10). The major water source in the community was examined for presence of snail (molluscs) using the kitchen sieve net method (11). Snails found were taken to the laboratory for identification and individual snail was examined for infection by exposure to sunlight.

**Subject's bio-data**

With the aid of a health worker, each participant was asked to complete a questionnaire, which contained information about demographic characteristics, duration of pregnancy, contact with stream and water usage, and clinical symptoms in pregnancy. Each woman had full examination normally carried out during routine ANC.

**Statistical analysis**

Differences in mean haemoglobin values between women positive for *S. haematobium* infection and women negative were tested for statistical significance using Chi square ($X^2$) analysis.

**RESULT**

Of the 37 pregnant women examined, 13 (37%) were infected with *S. haematobium* with an overall mean egg count of 82.5 eggs per 10 mls of urine. Microscopic haematuria was seen in 37% of all the urine samples while 29% presented with macroscopic haematuria. The age group > 30 years had the highest prevalence (50%) and also the highest mean egg count of 140:5, compared to age group 21–25 years with 12% and mean egg count of 56. This difference is statistically significant ($P < 0.001$) (Table 1).

Table 2 shows the breakdown of infection per trimester of pregnancy and clinical symptoms. The most common complaint by the women is abdominal pain/discomfort seen in 71% of those with schistosomiasis compared to 17% in those without schistosomiasis. This difference is statistically significant ($P < 0.05$). Other clinical complaints include dizziness, headache and fever (data not shown). All the women with schistosomiasis in the first trimester complained of abdominal discomfort.

Table 2 also illustrates the effect of *S. haematobium* on the mean haemoglobin values. The haemoglobin concentration values of women with *S. haematobium* infection were lower than the values in women negative for *S. haematobium* but these differences were not statistically significant ($P > 0.05$).

<table>
<thead>
<tr>
<th>Age range (Years)</th>
<th>Number Enrolled</th>
<th>Number Positive</th>
<th>% Infected</th>
<th>Mean count/10mles</th>
<th>% with macroscopical haematuria</th>
<th>% with microscopic haematuria</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>9</td>
<td>4</td>
<td>44</td>
<td>41.3</td>
<td>55</td>
<td>33</td>
</tr>
<tr>
<td>21-25</td>
<td>8</td>
<td>2</td>
<td>12</td>
<td>96.0</td>
<td>37</td>
<td>12</td>
</tr>
<tr>
<td>26-30</td>
<td>12</td>
<td>4</td>
<td>33</td>
<td>82.0</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>31-35</td>
<td>9</td>
<td>4</td>
<td>80</td>
<td>140.5</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>13</td>
<td>36</td>
<td>82.4</td>
<td>27</td>
<td>29</td>
</tr>
<tr>
<td>Trimester</td>
<td>No. Exam</td>
<td>Percentage Schistosoma haematobium positive</td>
<td>Percentage Schistosoma haematobium negative</td>
<td>Percentage with Abdominal Pain</td>
<td>Percentage with other Pregnancy related complaints</td>
<td>Mean HC g/dL</td>
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<td>-----------</td>
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<tr>
<td>1st</td>
<td>6</td>
<td>33</td>
<td>100</td>
<td>0</td>
<td>8.7 ± 1.6</td>
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</tr>
<tr>
<td>2nd</td>
<td>21</td>
<td>28</td>
<td>71</td>
<td>4</td>
<td>8.9 ± 1.5</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>10</td>
<td>50</td>
<td>60</td>
<td>10</td>
<td>8.6 ± 1.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>35</td>
<td>71</td>
<td>5</td>
<td>8.6 ± 1.3</td>
<td></td>
</tr>
</tbody>
</table>

No. Exam = Number Examined
Percentage Schistosoma haematobium positive
Percentage Schistosoma haematobium negative
Percentage with Abdominal Pain
Percentage with other Pregnancy related complaints
Mean HC = Mean haemoglobin concentration

**DISCUSSION**

This study has demonstrated that over 35% of pregnant women in rural areas endemic for schistosomiasis are infected with the parasite. The occurrence of this infection at high rate among the women is an indication of continuous pollution of water with schistosome eggs due to poor sanitation and improper sewage disposal. Studies in many parts of Nigeria have highlighted the hyper endemicity of schistosomiasis especially among school children in rural communities (12, 13, 14). Pregnant women are also at high risk of infection because of their close relationship with their children and the fact that they also engage in water related activities like washing in the stream, bathing, swimming and even fishing, which expose them to considerable contact with cercariae infested rivers.

The high incidence of abdominal pain among women with schistosomiasis may be due to congestion of pelvic vessels during pregnancy which facilitates the passage of eggs into the villi and intervillosus spaces, with resultant inflammatory reactions and pain (5). Exacerbation of acute appendicitis during pregnancy by schistosomiasis has also been reported (4). Masses of schistosome eggs can lodge throughout the body and cause acute inflammation of the appendix, liver and spleen (5). Acute infection is often asymptomatic, but can present with a non specific influenza-like illness or in extreme cases as potentially fatal Katayama fever, with cough, abdominal pain, diarrhoea, hepatosplenomegaly and eosinophilia.

The low haemoglobin level among women with schistosomiasis is attributed to chronic blood loss and iron deficiency, caused by terminal haematuria from urinary infection (2, 15). The most important cause of chronic blood loss and iron deficiency anaemia in the tropics, are helminthic infections (6, 17), especially hookworm (16), S. mansoni, S. japonicum, and S. haematobium infections (15, 17), and malaria (18).

Our study demonstrates that urinary schistosomiasis is still being actively transmitted among pregnant women in ile community, Osun State, Nigeria and could contribute to the abdominal discomfort, haematuria and anaemia seen in these women. The implementation of a control programme based on chemotherapy with Praziquantel® will help in the reduction of the frequency. Because the treatment with Praziquantel® is relatively simple and considered safe at least in the second and third trimester of
pregnancy, case management during pregnancy can be considered and would likely have important benefits in endemic settings (19, 20).

Also there is need for government to improve the health care delivery to the rural communities in the country. Most of the pregnant women do not make use of the ANC facility partly because of low level of awareness and also because the clinics are not well equipped. Although some of the women still prefers patronizing homes of traditional birth attendants (TBA), this mentality can be corrected with adequate public enlightenment and equipping the existing clinics. Provision of potable water, improved personal hygiene and extermination of immediate hosts are recommended.

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REFERENCES


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