Prevalence of Urinary Schistosomiasis among Primary School Children in Umuowele Community Agulu, Anambra State, Nigeria

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Abstract: The prevalence of Urinary schistosomiasis was investigated among primary school children in Umuowele community located around Agulu Lake, South East Nigeria, noted for Schistosoma haematobium infestation. The study was conducted between May and June 2012. Samples were collected from 120 pupils aged 8-15 years randomly selected for the study between 12 noon to 2 pm when maximum egg excretions usually occur. The samples were screened for the presence of ova of Schistosoma haematobium using urine sedimentation technique by the means of centrifuge spun at 2000 rpm for 5 minutes. The urine samples were also screened for proteinuria and haematuria using test strips (combi 9). No egg of Schistosoma haematobium was present in the urine samples examined. No haematuria and proteinuria was detected, perhaps those with malaria fever which can induce haemolysis, hence linkage of protein into the urine (proteinuria). The result suggested that there is no prevalence of Schistosoma haematobium infection among the pupils in Umuowele community, Agulu.

Keywords: Urinary Schistosomiasis • Schistosoma Haematobium • Haematuria • Umuowele Community and Agulu

INTRODUCTION

Schistosomiasis is considered as the second most important parasitic disease after malaria [1, 2]. It is estimated that about 200 million people worldwide are infected with these snail-transmitted, water-borne parasitic helminthes and that about 20,000 deaths are associated with severe consequences of the infection, including bladder cancer, renal failure (Schistosomiahaematobium), liver fibrosis and portal hypertension (Schistosomiamansonii) [3]. Most human schistosomiasis is caused by Schistosoma haematobium, Schistosoma mansoni and Schistosoma japonicum. Symptoms and signs depend on the number and location of the eggs trapped in the tissue [4]. Schistosoma haematobium is the causative agent of urinary schistosomiasis also called bilharziasis of the genitourinary tract [5], where as others are the causative agents of intestinal schistosomiasis. Schistosoma haematobium is endemic in over 50 countries in Africa and middle East. It is occasionally seen in West Africa [6]. Schistosoma haematobium eggs were the first parasite egg recorded in archeological materials, they were found in Egyptian mummified bodies [7]. It causes tissue damage to the urinary bladder [8], increase prevalence of leukocytes and elevated cytokine levels in semen from Schistosoma haematobium infected individuals has been observed, Bouchet et al. [9]. The transmission of schistosomiasis takes place only in a place where the fresh water snail intermediate host is present and where there is contact between the population and infected water [10] which contains the infective stage “cercaria”.

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Various socio-epidemiological factors are responsible for transmission of the disease. Among such factors are: socio economic status, sanitation, migration and water supply pattern. Those at risk of the infection are people involved in fishing activities, farming, bathing, paddling of canoes, swimming in the infected water, handling or eating the infected snail [11]. The infected rates are highest among children [12].

The clinical findings of acute schistosomiasis include an itchy rash (Swimmer’s itch) that occurs within an hour after cercariae penetrate the skin, followed by headache, chills, fever, diarrhea, eosinophilia (Known as katayama fever) 2-12 weeks after exposure [13]. Bloody urine can be obtained when the infection is intense. *Schistosoma haematobium* has the Bulinus truncates snail as the intermediate host. Thus indiscriminate defecation and urination near or directly into the water bodies help in the continuation of the prevalence of the organism in the area. Also poverty and ignorance are predisposing factors.

The disease can be controlled by the provision of urinary systems or the introduction of effective sewage disposal system or the introduction of effective sewage disposal system [14]. Wearing of foot wears (Rain boot) to protect the legs could also be a good protective measure against active penetration by the cercariae of the Schistosome [15].

Agulu Lake is a very large water body, used by the surrounding communities for cultural activities. It is stagnant and snails that transmit schistosomiasis prefer stagnant or slow flowing water, hence this brought about the suspicion of the lake as the source of the infection. The aims and objectives of this study were

- To determine the prevalence of urinary *schistosomiasis* among primary school children in Umuowele community, Agulu, Anamara state.
- To suggest measures on how to control, prevent and possibly eradicate the disease from the community

**MATERIAL AND METHODS**

**Study Area:** The study was conducted between May and June 2012 in Umuowele community, Agulu, which is at the Eastern side of Agulu Lake basin in Aniocha local government area of Anambra state. The community lies between latitude 6120N and longitude 700E. Agulu Lake is the largest water body in the area and is about 10km away from Awka, the state capital. There pipe borne waters in the area, but some of the inhabitants depend on the lake for their cultural activities.

**Subject and Consent:** The subjects were the pupils of Alpha nursery and primary school Agulu, St Theresa primary school Agulu and St John primary school Agulu in Umuowele community. The consent of the Igwe (Village head ) of Agulu was sought through the head mistresses of the various schools. The pupils were briefed on the benefit of the study. Forty pupils from each school aged between 8-15 years from primary 1-6 were selected by random sampling to participate in the study.

**Sample Collection:** For each of the recruited pupils, demographic data including the age and sex were recorded and unique study code of two digits was assigned to each subject. Clean universal containers, well labeled with the identification number and sex of the subject, were issued to the recruited pupils for collection of their urine samples. Samples were collected between 12noon to 2pm when maximum egg excretion occurs [13]. Information was gathered with the aid of questionnaires administered to the subjects through their head mistresses. Such information includes. Age, sex, source of water for drinking and washing, hobby, toilet and urinary system, proximity of place of residence to the lake and symptoms experience recently.

**Test for Haematuria and Protenuria:** The urine samples were screened for haematuria and proteinuria using test strips (Medi-test combi 9 by MachereyNagal post fach 101352 D- 52313 Duren). The result were read and recorded immediately. Haematuria was calibrated as 10 erythrocytes/µl, 50 erythrocytes/µl (++++). Proteinuria was calibrated as 30mg protein /dl (+), 100mg protein / dl (++), 500mg protein /dl (+++). The urine sample was examined macroscopically, based on the appearance and colour of the urine sample. The urinalysis test strip was dipped into the freshly passed urine at the laboratory and the excess urine was removed from the test strip by tapping the strip by tapping the strip against the universal container. The test strip with the colour scale on the strip container.

**Urine Sedimentation Technique:** Each urine sample was centrifuged at 2000 rpm (Revolution per minute) for 5 minutes in a test tube. The supernatant was decanted and the sediment was placed on a clean slide, covered with cover slip. Microscopic examination (egg count) was carried out using ×10 objectives.
RESULTS

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>NO OF SUBJECTS EXAMINED</th>
<th>NO (%) INFECTED</th>
<th>NO (%) WITH HEAMATURIA</th>
<th>NO (%) WITH PROTEINURIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-9</td>
<td>10</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>10-11</td>
<td>63</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>12-13</td>
<td>37</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>14-15</td>
<td>10</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>120</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
</tbody>
</table>

DISCUSSION

The study showed that there was no prevalence of *Schistosomahaematobium* infection (Urinary schistosomiasis) among primary school children in Umuowele community, Agulu. The result obtained in this study does not conform to the result obtained from previous studies about the prevalence of urinary schistosomiasis around Agulu Lake [16, 17]. Glonei [18] observed that the snails are responsible for the transmission of *Schistosomahaematobium* is *Bulinustruncatus* as confirmed by the infection status revealed by polymerase chain reaction (PCR) amplification of the division of risk assessment (Dra 1) as well as species identification by polymerase chain reaction-restricted fragment length polymorphism (PCR-RFLP). From the information gathered with the aid of the questionnaire, majority of the subject use borehole waters and well waters as their only source of water for their domestic activities. The provision of these borehole waters and well waters to the community could be as a result of increased awareness created and recommendations made by previous researchers who found urinary *schistosomiasis* to be endemic in the community during their study. Inyang-Etoh et al. [20] discovered that out of 108 participants, 52 (48.1%) were positive for haematuria suggesting *Schistosoma* Dra 1 repeat.

CONCLUSION

The result obtained in this research when compared to the result obtained by previous researchers, suggests that there is no prevalence of *S.heametobium* infection among the primary school children in Umuowele community of Agulu.

Recommendations: More studies should be carried out on the entire inhabitants of Umuowele Community, Agulu, to know the prevalence of urinary schistosomiasis among the entire population. The people who cannot avoid the lake (Irrigation farmers) should be advised to wear protective shoes (Rain boot) to prevent cercaria penetration into the skin. Activities like dumping of refuse, defecation and urination near or directly into the water body while swimming in the water should be discouraged.

REFERENCES


