

Original Research Article

# The Availability of Snail Hosts of *Schistosoma* Species and Prevalence of Urinary Schistosomiasis in Primary School Children (5 - 15) Years in Ihite - Ude Ofeme Umuahia North Local Government Area, Abia State

Ihemanma C.A, Ohiagbar O.N, Ajuga M.U

Department of Biology/Microbiology, Abia State Polytechnic, Aba, Abia State, Nigeria.

Corresponding Author: Ihemanma C.A

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## ABSTRACT

This study was conducted to determine the availability of snail hosts of *Schistosoma species* and prevalence of urinary *Schistosomiasis* among primary school children aged 5 - 15 years old in Ihite Ude Ofeme Umuahia North local government area of Abia State. Out of two hundred (200) children that participated in the study, 84 were males and 116, females. The urine samples were tested with combi 9 test strip, centrifuged and examined microscopically in the laboratory. The prevalence of infection of *Schistosoma haematobium* in the area was 40 (20%) out of which 16 (16.67%) were males and 24 (23.33%) were females. The highest prevalence rate of *Schistosoma haematobium* infection was observed in the age group 13 –16 (25.6%) years, whereas 5 - 8years had the lowest prevalence rate (17.3%). The prevalence rate of infection is moderate in the area. On the other hand, snails picked from the river and its surroundings were observed, out of 404 snails, 263 (65.9%) were found to be *Bulinus*, 68 (16.8%) *Biomphalaria* and 73 (18.65%) *oncomelania*. Instructing children on dangers of swimming in infested river and provision of a reliable source of water for the people will improve the health status of children living in the study area.

**Keywords:** *Schistosoma haematobium*, Prevalence, Urine Samples, Umuahia, School Children.

## INTRODUCTION

(*Bulinus*) is the most common fresh water snail species that function as intermediate host for the *Schistosoma haematobium*. (Kane, *et al.*, 2008). These snails are widespread in Africa including Madagascar and the Middle East. The genus is considered to represent a potentially serious threat as a pest, an invasive species which could negatively affect human health, agriculture, and natural ecosystems. Urinary

Schistosomiasis caused by the fluke, *Schistosoma haematobium* is one of the neglected tropical diseases associated with serious health problems and morbidities (Rollinson, *et al.*, 2009). There are three main species of *Schistosoma* infecting humans. *Schistosoma mansoni*, *Schistosoma japonicum* (which inhabit the mesenteries around the intestine causing intestinal Schistosomiasis) and *Schistosoma haematobium* which is found

in the venules surrounding the bladder, causing urinary *Schistosomiasis*.

Urinary *Schistosomiasis* has been estimated to affect 249 million people worldwide, especially poor people who live in conditions that favour transmission and have no access to proper clean water and healthcare or effective preventive measures. The infection is responsible for nutritional deficiencies and growth retardation, adverse effects on cognitive development as well as for decreasing physical activity, school performance and work capacity (Stephenson, *et al.*, 1993). The transmission of urinary *Schistosomiasis* is dependent on the availability of a snail host and human activities with natural water sources either because of their profession (agriculture, fishing) or because of lack of reliable water for drinking, washing and bathing. The disease is common among children as they are more likely to play in contaminated water.

Methods of preventing the disease include improving access to clean water and reducing the numbers of snails in areas where the disease is common, avoiding passage of faeces or urine into the water bodies, entire group may be treated all at once and yearly with the medication praziquantel, this is done to decrease the number of people infected and therefore decreasing the spread of the disease.

## **MATERIALS AND METHODS**

### **The Study Area:**

This study was conducted in the semi-urban rural community of Ihite-Ude-Ofeme which is situated in Umuahia North L.G.A in Abia State, Nigeria. The community is a rain-forest belt of Nigeria with a maximum and minimum daily temperature of 35% and 20% respectively. The climate of the area is tropical and distinct dry season between November to March and a rainy season from April to October. The ecological characteristic as well as the socio-cultural and daily

economic activities in the community are farming, petty trading, sand drilling, civil service are their main occupation. Most residents are of Igbo ethnicity and few foreigners. The community neither has reliable pipe borne water supply or well water; rather they make frequent use of the stream water for their domestic chores such as washing, bathing and swimming etc.

### **Map of Ihite-Ude**



Source: Map data © 2015

### **Study Population**

The study comprised of primary school children of (5 – 15) years. After acquiring consent from the head of the different households, 200 children were given the sterile urine specimen bottles. A well structured questionnaire was given alongside the specimen bottle for each of the 200 children out of which (116) were females and 84 were males.

### **Sample Collection**

Using structured questionnaire, information were obtained from each person about age and sex which was tagged on the sterile containers before giving them out. Instructions were also passed to their parents on how to collect the urine sample; collection of urine was done between the hours of 7.00 to 9.00am and were transported to the microbiology laboratory department of Abia State Polytechnic, Aba, Abia State Nigeria. Several species of snails were retrieved on

site for tagging and for identification purposes.

### Parasitological Examination

In the laboratory, the urine samples were first examined macroscopically for colour appearance, eg, presence of blood and thereafter, urinalysis was conducted using combi 9 test strip. 5ml of each of the urine samples were transferred into clean test tubes and were centrifuged at 5000rpm for 5 minutes. The supernatant was decanted leaving just the sediment. A dropper was then used to place a drop of the sediment on a microscope slide and was covered with a cover slide; it was then viewed under a light microscope using x 10 and x40 objectives. Samples containing eggs of *Schistosoma haematobium* were recorded. Snails collected were also examined for species identification.

## RESULTS

**Table 1: Availability of the Schistosoma Snail Hosts As Observed**

Snail Host	Number examined	% Occurrence
<i>Bulinus</i>	263	(63.8%)
<i>Biomphalaria</i>	68	(16.8%)
<i>Oncomelania</i>	73	(18.06%)
Total	404	99.2%

**Table 2: Prevalence of Urinary Schistosomiasis Among School Children By Age**

Age Interval	Number examined	Number Infected (%)
5 – 8	75	13 (17.3)
9 – 12	86	17 (19.8)
13 – 16	39	10 (25.6)
Total	200	40

$$X^2_{cal} = 0.7240, X^2_{tab} = 5.991, Df = 2, P < 0.05$$

**Decision:** Since  $X^2_{cal} (0.7240) < X^2_{tab} (5.991)$ , we accept  $H_0$  and conclude that urinary *Schistosomiasis* infestation is not dependent on age.

**Table 3: Gender Related Prevalence of Urinary Schistosomiasis among School Children**

Gender	Number Examined	Number Infected (%)
Male	84	16 (19)
Female	116	24 (20.7)
Total	200	40

$$X^2_{cal} = 0.0552, X^2_{tab} = 3.841, Df = 1, P < 0.05$$

**Decision:** Since  $X^2_{cal} (0.0552) < X^2_{tab} (3.841)$ , we accept  $H_0$  and conclude that urinary *Schistosomiasis* is independent on gender.

## DISCUSSION

There are remarkable pervasiveness and distribution of urinary *Schistosomiasis* in Nigeria due to the differences in geographical and social demographic characteristic of the different localities in the population. Several studies were previously undertaken in an attempt to determine the prevalence of *Schistosomiasis*. In different states of the country, consequently various prevalence of the infection ranging from high to low rates were reported (Celestine, *et al.*, 2012). Previous studies have also reported that in endemic untreated populations, the prevalence of urinary *Schistosomiasis* is usually higher in children than in adults.

From the result obtained, out of 200 people screened for urinary *Schistosomiasis* 40(20%) showed positive. The current prevalence of urinary *Schistosomiasis* in Ihite Ude Ofeme is 20%. To the best of my knowledge, there have been no previous studies on the prevalence of *Schistosomiasis* in the area. The prevalence (20%) is low when compared to the rates reported in other parts of Nigeria. Ogwimike *et al.*, reported Aninri L.G.A (45.5%) as the place with the highest percentage of urinary *Schistosomiasis* in Enugu State, similarly a prevalence of 42.3% was reported in Abia State, Southeast of Nigeria. Moreso, other studies reported prevalence of urinary *Schistosomiasis* that is comparable or even lower. For example, the prevalence rates in some parts of Borno and Ebonyi States were 24.3% and 21.5% respectively (Biu *et al.*, 2009). Moreover, very low overall prevalence rate (4.5% and 11.3%) were reported in Abin Community in Cross River and Ohaji/Egbema in Imo State respectively (Okoli, *et al.*, 2006).

The observed differences in the magnitude of infection may be due to geographical and social-economic reasons. Notwithstanding other factors that may influence the prevalence of urinary *Schistosomiasis* include age and sex. In

current studies, males were two times more likely to be infected with the infection than females; this was comparable with the studies conducted in Danjarima community in Kano (Sarkinfade et al 2009).

In relation to gender, greater number of female had the disease when compared to the male (20% and 19%) respectively. This may be due to variation in behavioural patterns of such person regarding water use and contact. This is contrary to previous reports from endemic areas where urinary *Schistosomiasis* was found to be remarkably higher in male than female. The possible explanation might be that female children living in Ihite-Ude Ofeme are not restrained by socio-cultured practices in terms of spending equal time with the male ones at similar site.

In relation to age, children whose age ranged from 5 - 8, 9 - 12 and 13 - 16 had the prevalence rate of 17.3%, 19.8% and 25.6% respectively. Those in the age range of 13 - 16 years were mostly infected with urinary *Schistosomiasis* probably because they are frequently involved in activities that bring them in contact with the source of infection. Statistical analysis for test of no relationship between age and *Schistosoma haematobium* infection showed that there is no significant difference between urinary *Schistosomiasis* infection and age.

## CONCLUSION

This study reveals that *Schistosomiasis* is prevalence in Ihite Ude Ofeme, Umuahia North local government area in Abia State. This findings support an urgent need to start an integrated and effective *Schistosomiasis* control programme of eliminating the disease. Besides periodic drug distribution, health education and community mobilization, reliable waste disposal system is also likely to decrease the transmission and morbidity of *Schistosomiasis* in the study

area. Wide distribution and use of praziquantel is also required as an oral doze to the infected individuals.

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