Full Length Research Paper

*Schistosoma haematobium* Infections among school children in Keffi Town, Nasarawa State, Nigeria

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Using cleaned, autoclaved wide mouthed universal bottles and instructed by demonstration on how to provide urine for the study, 20mls of clean early morning mid-stream catch urine samples were collected from 200 pupils in Keffi Town. With the assistance of their Teachers, pupils’ basic epidemiological information was obtained through constructed questionnaires. The specimens were labelled, parked appropriately and taken to the laboratory for analysis. Using a reagent strip and the manufacturer’s colour chart, the amount of blood in the urine was estimated. The sedimentation method was used and the sediment transferred onto clean grease free glass slide, and examined microscopically. Of the 200 samples (98 males and 102 females), 61 (30.5%) were infected with *Schistosoma haematobium*, in which males had a prevalence of 15.0% compared to 15.5% among females. The statistical analysis revealed that there was no significant difference (P<0.05) in *Schistosoma haematobium* infection among males and females. The prevalence of *Schistosoma haematobium* infection among school children in relation to age showed that ages 11-13 years had the highest rate (40.98%). The statistical analysis also revealed a significant difference (P>0.05) in *Schistosoma haematobium* infection among the 4 schools in the study area. There was also a strong association between the prevalence of *Schistosoma haematobium* and haematuria among the pupils.

Key words: *Schistosoma haematobium*, Prevalence, School children, Haematuria, Keffi Town.

INTRODUCTION

Urinary Schistosomiasis also called Bilharzias is a parasitic disease caused by a digenetic blood fluke of the genus *Schistosoma* called *Schistosoma haematobium*. The disease is the second most prevalent neglected tropical diseases after hookworm (Hottez and Kamath, 2009) and remains an important public health problem globally especially in the Sub-Saharan African. Of the world’s 207 million estimated cases of Schistosomiasis, 93% occur in the Sub-Saharan Africa (192 million) with largest number (29 million) in Nigeria followed by United Republic of Tanzania (19million) (Hottez and Kamath, 2009). Although *Schistosoma haematobium* infection do not always result in clinical diseases and many infections are asymptomatic, *S. haematobium* infection is said to produce bladder wall pathology in approximately 18million people in Sub-Saharan African and 10million people suffer from hydronephrosis and renal failure (Van der Werf et al., 2003). A significant percentage of women and men with urinary Schistosomiasis acquire genital ulcers and other lesions (Kjetland et al., 2006). Poor reproductive health including sexual dysfunction and infertility [4].Genital Schistosomiasis has also been incriminated to promote horizontal transmission of HIV/AIDS in Sub-Saharan African (Kjetland et al., 2006).

In addition to the organ-specific pathology for *S. haematobium* infections, there is also an increasing evidence for more generalized morbidity resulting from chronic inflammation of these long-standing infections (Kjetland et al 2006, King et al., 2005). The most important are anaemia of chronic inflammation and iron deficiency anaemia, growth stunting and malnutrition among children, fatigue and diminished physical fitness and impaired cognitive developments among school children (Kjetland et al 2006, King et al., 2005).

There are several factors contributing to the high rate of *Schistosoma haematobium* infection in developing
countries. Among these are; extreme poverty, lack of knowledge of the risks, inadequate or total lack of health facilities and poor sanitary conditions in which they lead daily (Hottez and Kamath, 2009, Uneke et al., 2010). This study is aimed at assessing the prevalence and risk factors of *Schistosoma haematobium* infection among pupils in some primary schools in Keffi town, Nasarawa State, Nigeria.

### MATERIALS AND METHODS

#### Study area

This cross-sectional study was carried out in Keffi town, Keffi Local Government Area of Nasarawa state, Nigeria. The town is 68km from Abuja, the Nation’s Federal Capital Territory and 128Km from Lafia, the Nasarawa State Capital. Keffi is located between latitude 8° 5’ North of the above sea level (Lyam, 2006). According to the 2006 National Census, Keffi has an estimated population of 6700 in which more than 60% reside in the rural areas (Ekpo et al., 2010). From North to South of Keffi, runs the River Antau that provides water for drinking, washing and the outlet of some marshy places for rice farming. Keffi also experience a raining season that lasts from April to October and a dry season from November to March.

#### Ethical issues

Approval for this study was obtained from the Ethical Committee on Infectious Disease of the Federal Medical Centre, Keffi. Approval was also obtained from the Local Government Council Education Authority, the Authorities of the various schools as well as from the pupils used for the study. The approval was on the agreement that participants’ anonymity must be maintained, good laboratory practice/quality control ensured, and that every finding would be treated with utmost confidentiality and for the purpose of this research only.

#### Collection of samples

Twenty (20) mililitre of clean mid-stream catch of early morning urine samples used for this study were collected from 200 pupils in 4 primary schools in Keffi town from 10am-12noon daily from June to August 2010. Individuals were given cleaned, autoclaved wide mouthed universal bottles and instructed by demonstration on how to provide urine for the study. Structured questionnaires requesting some basic epidemiological information with the assistance of their Teachers were also used. The specimens were labelled appropriately, placed in a cold ice packed box and taken to the laboratory for analysis.

#### Laboratory examination

In the laboratory, a reagent strip (Urine-10 parameters, Cyress Diagnostics 3201 Langdorp-Belgium) was carefully dipped into urine sample and allowed to stand for 5seconds. The colour change of the strip was compared with the manufacturer’s colour chart to estimate the amount of blood in the urine.

The sedimentation method was used by centrifuging 10ml of the urine sample at 5000rpm for 5minutes. The supernatant was then discarded and the sediment transferred onto clean grease free glass slide, covered with a cover slip and examined microscopically using x40 objective to identify *Schistosoma haematobium* ova which is characterised by the presence of a terminal spine. Eggs were counted and recorded as eggs/10ml of urine.

#### Statistical Analysis

The Chi-squares ($X^2$) test and Correlation analysis ($r$) were used to compare the percentage infections of *S. haematobium* in different categories.

### RESULTS

Out of the 200 pupils from 4 primary schools in the study area constituting 98 males and 102 females who participated in the study, 61 were infected with *Schistosoma haematobium* ie an infection rate of 30.5% in which the males had a prevalence of 15.0% compared to 15.5% among females (Table 1). The statistical analysis also revealed that there was no significant difference (P<0.05) in *Schistosoma haematobium* infection between males and females among the school children.

The prevalence of *Schistosoma haematobium* infection among school children from the 4 schools in relation to age (Table 2) showed that ages 11-13 years had the highest rate (40.98%) and ages 5-7 years had the least

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<th>Table 1. The prevalence of <em>Schistosoma haematobium</em> infection among the 4 schools in relation to sex</th>
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<td><strong>Sex</strong></td>
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$X^2$=386.17, P<0.05
(11.48%). The general prevalence for Schistosoma haematobium infection in the 4 schools is represented in Table 2. The statistical analysis revealed a significant difference (P>0.05) in Schistosoma haematobium infection and a strong association between Schistosoma haematobium, haematuria and proteinuria among the school children in the study area (Table 3).

### DISCUSSION

Urinary schistosomiasis is generally endemic in Nigeria (Hottez and Kamath, 2009). Although there is no current estimate of the disease in the country, past estimates have put the infection at about 25 million people and 101 million at risk of infection. The result of this study shows a prevalence of 30.5% of urinary schistosomiasis among the four primary schools in Keffi town. This result is however; lower as compared to that observed (58.1%) among school children in Ilewo-Orile a rural community near Abeokuta, Nigeria (Anosike et al., 2001). 71.8% in settlements near a dam reservoir in Ogun State, Nigeria [12] and that observed (79.4%) in Ezza-North LGA of Ebonyi state, Nigeria (Uneke et al., 2010). These differences in prevalence among these studies could be attributed to the types of water bodies and water contact practices by the school children in the study areas. All the ages (5-16years) were infected (Table 2) indicating that urinary schistosomiasis occurs early in life through exposures to contaminated water bodies by the school children since it is difficult or impossible to prevent children in this area from visiting the streams for various activities such as bathing, and washing.

There is no significant difference in the prevalence of urinary schistosomiasis among sex (Table 1). This is an indication that all gender were equally exposed to water bodies as contact with the stream by primary school children remain unabated throughout that age. The strong association between Schistosoma haematobium and microhaematuria in this study (Table 3) is an indication that blood in the urine (haematuria) is a characteristic symptom of Urinary schistosomiasis in an endemic community.

### CONCLUSION

This study has shown a 30.0% prevalence of Schistosoma haematobium infection among primary school children in Keffi town. The high prevalence of this infection (40.98%) among ages 11-13 years is an indication that at this age, the children are highly exposed to Schistosoma haematobium infections and forms a major public health problem and may be reasons for sexual dysfunction and infertility in the community. This age group may also engage in interpersonal social activities that may enhance the transmission of the parasite. The Community Health Personnel, parents and teachers should therefore be aware of this parasite as a potential cause of illness in the society and they can play a major role in promoting hygiene practices and educating the children on the danger of the parasite and swimming in rivers so that the risk of acquiring the parasites during childhood may be reduced. Furthermore, the treatment and control of this parasitic infection among school children is of public health concern and should start from the school age and not until adulthood.

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