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Prevalence of *Schistosoma haematobium* among L.G.E.A primary school children rigachikun kaduna

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Abstract
Prevalence of urinary schistosomiasis among L.G.E.A primary school children in Igabi local government Rigachikun Kaduna. One hundred and twenty (120) samples of urine were analysed. Centrifugal sedimentation technique was used and the deposits were examined microscopically. Out of the 120 urine samples analysed, twenty six (26) were found to be positive for *Schistosoma haematobium* giving a prevalence of 21.7%. L.G.E.A Rigachikun II had a prevalence rate of 25%, while Mallam Jallo Model primary school had the prevalence rate of 18.3%. Age group 5-9 years had 0% prevalence. Age group 10-14years had a prevalence rate of 18.2%. While 15 and above, had the prevalence rate of 31.0%. A total of 120 urine samples were examined, comprising of 76 from males in which twenty five (25) were positive with prevalence rate of 32.9% and 44 sample collected from females, in which one(1) was positive with prevalence rate of 2.3%. Questionnaire was administered to obtain the respondent demographic information with contact with contaminated water. The study had provided an idea on the prevalence of urinary schistosomiasis among primary school children in the communities.

Keywords: urinary schistosomiasis, *Schistosoma haematobium*, bilharzias, *S. mansoni*

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) [5] 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) [5].

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) [6]. 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) [6].

There are several factors contributing to the high rate of *Schistosoma haematobium* infection in developing Scholarly 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 e*t al.,* 2010) [5].

Though the disease kills few people, its clinical effects, prevalence and association with other diseases and expansion of agriculture and water development projects, movement of population and increase in population density and some social habits like passing urine and faces near water bodies makes it a problem of great health importance (WHO, 2010). In the present study attention has been focused on the epidemiological survey of the disease in local vulnerable population with the broader objective of control programme for schistosomiasis in the affected areas.

Accordingly, the estimates for morbidity and mortality in affected populations are high with school age children usually presenting with the highest prevalence and intensity of infection (WHO, 2002) [11]. Nigeria is one of the countries known to be highly endemic for urinary schistosomiasis with estimated 101.28 million persons at risk and 25.83million people infected (Engels *et al.,* 2015). Studies, in Nigeria among school aged children in various parts of the countries and in both rural and urban environments have shown that *S. haematobium* is clearly a problem of this aged children ranges from 20-40% in typical communities (Umar and Parakoyi, 2016).

The transmission of urinary schistosomiasis is contigent on the presence of infected water, intermediate host and contact with human population (Ekwunife, 2013) [4]. Once excreted by the snail, the infective free swimming cercariae then penetrate the intact skin of humans (Robber *et al.,* 2009).

In 2005, the World Health Organization (WHO) noted that the prevalence and intensity of the disease have been increased in areas undergoing water resource development, especially irrigation (WHO, 2010) [9]. The disease is endemic in most African countries where up to one-third of school age children may be actively infected although not always aware of their status. *Schistosomiasis* is a neglected disease and very few studies have described its epidemiology in the Vhembe district

of South Africa. Thus studies are needed to understand the epidemiology of these infections in order to implement measures necessary for their control in this region. The distribution of *Schistosomiasis* varies considerably with regions. In developing countries, the true epidemiological picture is not clear because of inadequate research on this infection despite its relevance in planning *Schistosomiasis* control in any locality. However, within the context of the spatial methodology used and the limitations of the available disease data, it has not been possible to predict the prevalence of *Schistosomiasis.* The most common method of diagnosis of *Schistosomiasis* in epidemiological surveys carried out in Africa is the identification of eggs in the stool for *S. mansoni or in the urine for S haematobium.* Drug treatment is still the principal method of control and the drug of choice is praziquantel, however the degree of recovery from the infection depends on the extent of the damage caused by the infection (WHO, 2010) [9].

Schistosomiasis is one of the most wide spread of all human parasite disease, ranking second only in term of socioeconomic and public health importance in tropical and subtropical areas (Kamel, 2010). As the result of low level resistance and intensive water contact when playing and swimming, children and some adult age like 10-18years are most heavily infected because of lack of reliable source of safe water for drinking, washing and bathing. Due to the spread of Schistosomiasis infection.

Schistosomiasis is considered as the second most important parasitic disease after malaria (Abdulwahab, and Afolabi, 2009). It is estimated that about 200 million people world-wide 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*), damage to the urinary bladder liver fibrosis and portal hypertension (*Schistosomiamansoni*) (Amali 2005). Most human *schistosomiasis*is caused by *Schistosmahaematobium Schistosomamansoni* and *Schistosomajapanicum*. Symptoms and signs depend on the number and location of the eggs trapped in the tissue (Amono *et al.,* 2007). *Schistosoma haematobium* is endemic in over 50 countries in Africa Middle East.

Materials and Methods

Study area and population

The study area is Rigachikun in Igabi Local Government Area of Kaduna State Nigeria. It is located in the Northern part of Kaduna metropolis and mostly populated by the Hausa's. The main domestic sources of water in these area is tap, well, ponds, rivers and streams. Sample were collected from two (2) primary schools, L.G.E.A Primary School Rigachikun II and Mallam Jallo Model Primary School within the vicinity of the two schools is stream where the pupils go for swimming bathing washing etc

Collection of samples

A total of 140 samples were randomly collected from both male and female. Each child was administered a simple health semi-structured questionnaire to collect socio-demographic and anthropometric data of the pupils. Information on age, sex, educational background, perception, knowledge of symptoms, sources of water supply / mode of transmission and health implications of schistosomiasis were obtained

Parasitological examination and analysis

Macroscopic examination

Urine sample collected were physically examined to determine their colour and turbidity. They were categorized and documented.

Microscopic Analysis

Each of the urine sample was examined for schistosome eggs using the sedimentation by gravity method (WHO, 2008) [10]. 20ml of the urine sample was transferred in to a centrifuge tube and was centrifuged at 3000 rpm (Revolution per minute) for 15 minutes in a test tube. The supernatant was decanted and the sediment was placed on a clean grease glass slide, covered with cover slip. Microscopic examination (egg count) was carried out using ×10 objectives (Mbah, 2014). Urine samples containing egg(s) of *S. haematobium* which is characterised with a terminal spine were recorded as positive, while absence of eggs of schistosomes was considered negative. The eggs were counted and recorded those of the negative sample were repeated for confirmation (Ekwunife, 2003) [4].

Results

Table 1 shows the prevalence of *Schistosoma haematobium* infection was 26 out of 120 of the study population (Table 1). The prevalence of *S. haematobium* by schools showed that the prevalence of *S. haematobium* was recorded in all the School with LGEA Rigachikun II having the highest number of positive test 15 (25%) and Mallam Jallo Model School with 11 (18.33)% respectively.

The result with respect to age group of the children in the two schools the prevalence of *S. haematobium in* 5-9 years old children is (0%), while age group 15 and above 18years is (31.03%) this is presented in Table 2.

The result based on sex related prevalence of Schistosomiasis in the study area revealed that male children has the highest number with a value of 25 out 76 (32.9%) and the female with 1out 44 (2.27%) as show in Table 3.

The respondent's demographic information according to their sources of water are shown in Table 4.

Table 1: Prevalence of *Schistosoma haematobium* Among L.G.E.A Primary Schools Children in Rigachikun II and Mallam Jallo Model Primary School

Schools	Number Examined	Number Infected	Prevalence (%)
LGEA Rigachikun II	60	15	25
Mallam Jallo model primary school	60	11	18.3
Total	120	26	21.7

Table 2: Prevalence of *Schistosoma haematobium* in L.G.E.A Primary Schools Children in Rigachikun II and Mallam Jallo Model Primary School in Relation to Age Group

Age Group	Number Examined	Number Infected	Prevalence (%)
5-9	18	0	0
10-14	44	8	18.2
15 and above	58	11	31.0
Total	120	26	21.7

Table 3: Prevalence of *Schistosoma haematobium* L.G.E.A Primary Schools Children in Rigachikun II and Mallam Jallo Model Primary School with respect to Sex

Gender	Number Examined	Number infected	Prevalence (%)
Male	76	25	32.9
Female	44	1	2.3
Total	120	26	35.2

Table 4: Respondent Demographic Information from primary school children in Rigachikun II and Mallam Jallo Model Primary School

Factors	Responses	Frequency	Percentage
Source of water	Pipe borne	14	17.9
	Borehole	3	3.8
	Stream/river	13	16.6
	Well	18	23.6
	Lake	-	-
	Spring	-	-
	Total	78	61.9

Discussion

The overall prevalence of *Schistosoma haematobium* in the study area is 21.7% indicating infection in the study area. The infection in school children were primarily due to exposure occasionally by washing, bathing, dry season farming and fishing activities with peak infection within the raining season. This observation agree with the reports of Okpala *et al*., (2004). Sewage disposal, indiscriminate defecation, anal urination is very common, literacy level is low and safe water is greatly inadequate with consequence effect on the community health Rigachikun Local Government Area.

The result of the study area shows that the prevalence of *Schistosoma haematobium* out of 120 children has a prevalence of 21.7% as shown in table 1. L. G. E. A. Rigachikun has a prevalence rate of 25% were 60 samples were examined and 15 were positive while Mallam Jallo model primary school had a prevalence of 18.3%. The study shows that male were more infected with *Schistosoma haematobium* compared to the female, this could be as a result of exposure of the sex to infected water due to playful activities like swimming etc. Age group 5-9 years shows no infection of *Schistosoma haematobium* out of 18 samples examined while 10-14years showed positive result of 8 out of 44 samples examined and 15 year and above had the highest number of infected samples which was 18out of 58 samples collected. Based on age group, 10-17 and above are of higher risk of getting infected since this age range supports the activities that are risk factors to the infection, this corresponds to the findings of Okpala *et al*., (2004) [8]. Individuals within the age range of 10 -17 years were found to be more infected by the disease schistosomiasis than individuals in other age groups. This finding is in agreement with that of, Okpala *et al*. (2004) [8]. The possible reason for this finding may be probably because they spent more time in rivers for one or more water contact activities, such as bathing, playing, swimming or washing clothes, as a result, they get infected by the infective stage of the parasite cercariae.

Conclusion

In conclusion, the study had provided an idea on the prevalence of *Schistosoma heamatobium* among primary school children attending L.G.E.A Primary Schools in Rigachikun II and Mallam Jallo Model Primary School, Rigachikun Kaduna State. The prevalence of *Schistosoma heamatobium* among L.G.E.A primary school children examined showed that schistosomiasis is a public health problem, the prevalence rate was higher in males than in females.

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