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Research Article

STUDIES ON THE OCCURRENCE OF *SCHISTOSOMA HAEMATOBIUM* INFECTION AMONG PUPILS IN SOME SELECTED PRIMARY SCHOOLS IN WUDIL TOWN, WUDIL LOCAL GOVERNMENT AREA, KANO STATE OF NIGERIA

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ABSTRACT
Studies of occurrence of *Schistosoma haematobium* infection among pupils in some selected primary schools in Wudil town was carried out between November, 2015 to December, 2015 to determine the prevalence of the infection among different sexes as well as the different age groups. The study is apt due to the high rate of a lot of water activities that people engaged in Wudil town such as swimming, fetching water for drinking, bathing, cooking, *et cetra.* A total of 150 urine samples were aseptically collected in sterile universal containers from pupils of the 3 different primary schools in Wudil Town and were taken in cold chain to the laboratory for analysis. The overall incidence of *S. haematobium* was 19 with no haematuria. Wudil Special Primary School recorded 8(42.10%) and Bauchiyal Science Project School recorded 6(31.57%) as the schools with highest number of schistosomiasis incidences, whereas the least was KUST Staff Primary School, 5(26.31%). Incidence according to age was 12(31.57%). Age group 5-10 years has the highest incidence with total number of 87. Incidence according to sex was higher in the males (11) than females (8), that is, 57.89% and 42.10% positive respectively. The problems of lack of pure and portable water supply in schools and homes in Wudil town makes the Children at high risk of exposure to schistosomiasis and implications of this disease in children may affect the socioeconomic development of a country (Nnoruka, 2000).

Keywords: *Schistosomiasis, Schistosoma Haematobium, Incidence, Cercariae, Haematuria, Urine*

INTRODUCTION
Schistosomiasis, also known as bilharziasis is a parasitic disease caused by trematodes from the genus schistosoma. There are four species that infect humans. *S. mansoni, S. japonicum, S. intercalatum and S. mekonji* all of which causes intestinal schistosomiasis and *S. haematobium* causes urinary schistosomiasis (Bichi *et al.*, 2003).
Urinary schistosomiasis is often chronic and cause pain, secondary infection, kidney damage and even cancer. It has been infecting humans for at least 4000 years and had its own specific hieroglyph in ancient Egyptian. It is caused by parasitic blood flukes known as Schistosoma, named in the honor of Theoder Bilotorze an assistant professor in Cairo (Egypt). In the time before treatment become widely available, it was still so prevalent in Egypt that boys were traditionally excepted to go through a "male menarche" – sometime during adolescence, it was a normal thing for them to urinate blood. *S.haematobim* infection continues to be a significant public health problem in most of Africa and the Middle East, second only to malaria among parasitic diseases. The transmission of the disease is dependent on the presence of water, water snails and human behavior in relation to infestation with cercariae and its immediate environment. For these epidemiological reasons, more than 168 million people in Africa and 271 million worldwide were affected. The risk of infection can be lowered by spending less time in water or as well as by covering the body with petroleum jelly (Bichi *et al.*, 2003).
The combine effects lead to hydroureter, hydronephrosis and anaemia. This conditions as reported by Warren (2011) are serious and could eventually lead to kidney failure or uremia if untreated. Ova are

deposits in various organs of the body including liver, lungs and in female vulva, cervix, vagina, ovaries, fallopian tubes and placenta to cause pelvic schistosomiasis. A few eggs in the nervous system have been known to cause severe neurological conditions (Jukes, 2002).

Possible consequences of *S. haematobium* infection include haematuria, dysuria, nutritional deficiencies, and lesions of the bladder, kidney failure, an elevated risk of bladder cancer and in children growth retardation. Africa account for over 85% of Schistosomiasis burden. Nigeria is the most endemic country in the world for urinary schistosomiasis with an estimated 25.83 million people infected in Enugu State, located in the south-eastern part of Nigeria, haematuria is a common complaint in many communities. Several studies have indicated bacteriuria co-infections with urinary schistosomiasis in the etiology of bladder cancer and other complications. Studies have shown that it may take up to 10-20years after initial co-infection for terminal complications such as renal failure and squamous cell as carcinoma of the bladder may develop (Black, 2005).

Schistosomiasis is one of the major communicable disease of public health and socioeconomic importance of the tropical and sub-tropical region. The disease has been reported to be the second to malaria as a source of human morbidity (Wurrell, 2002). As far it is known, human remain the most important host for haematobium. The snail intermediate host apparently has less string requirement for water temperature than snail host of *S.mansoni*. This may partly explain the relatively and distribution of *Schistosoma heamatobium* on the Africa Continent (Markel, 2011). The objectives of this study include: to assess the predisposing factors to the transmission of the parasite; to examine school aged children for the presence of *Schistosoma haematobium* infection and to access the rate of infection among sex group and age category of the children.

MATERIALS AND METHODS

Study Area

Wudil local government area which is 43 kilometers south away from the State Capital. Wudil Town is one of the important commercial towns in Kano State. It is located on the latitude 11o 8.2127'N and longitude 8o 5'E of the Greenwich meridian. It is bordered with Warawa local government to the west and north, Gaya to the east, Garko and Albasu to the south. The 2006 census puts the population of the area at 185, 189 with an estimate land mass of 362 km² (NIPOST, 2006). The area is lowland situated at an altitude of 413m above the sea level. It is located along the Kano–Maiduguri highway. It has high commercial activities (weekly market), with majority of its populace using farming as a source of income, few people engage in fishing activities (as such, the town is famous because of the river), cattle rearing, pottery and traditional hand weaving (Dambazau, 2008).

Observation of the Study Population and Area Predisposing Factors (Environment/Socioeconomic Factors)

According to the finding, the sources of water observed in the area were six (6) boreholes, five (5) wells, Two (2) ponds and one (1) river. The presence of river and other sources of drinking water coupled with water contact behavior are factors predisposing the transmission of urinary schistosomiasis.

Sample Collection and Handling

An approval was sought from the headmasters of the three (3) respective primary schools. A total of one hundred and fifty (150) urine samples were randomly collected among the 3 sampled schools in respect to age and sex without bias. Clean, sterile, dry, wide mouth and leak proof universal urine containers were given to each pupil to collect samples of urine batch by batch of about 15-20ml for the investigation and were cautioned on the cares to be taken during collection such as the collection of early morning urine or midstream urine samples (Cheesbrough, 2006). Essential data of the pupils such as age, sex, sample number and time of the collection were noted on the containers and transported to the laboratory for analysis within an interval of 2hours from collection (Harrison *et al.*, 2000).

Sample Preparation and Examination (Wet Preparation Method)

The 150 urine samples collected from the three respective primary schools was analyzed for the presence of *S. haematobium* in the laboratory according to Cheesbrough (2006).

Aseptically, about 10 ml of well mixed urine was transferred into a labeled conical tube and centrifuged at 3000 rpm for 5 minutes. The supernatant fluid was poured (by completely inverting the tube) into a second container not the original one. This can be used for biochemical tests to avoid contaminating the original urine which may need to be cultured (depending on the findings of the microscopic examination). The sediment was remixed by tapping the bottom of the tube. One drop of the *well-mixed* sediment was transferred to a clean grease-free glass slide and covered with cover slip. The preparation was microscopically examined using the 10x and 40x objective lens with the condenser iris *closed sufficiently* to give good contrast. Eggs of *S. haematobium* were recognized by their large size (about 145 x 55 µm) and spine at one end. The urine contained red cells and protein (Cheesbrough, 2006).

RESULTS AND DICSUSSION

Results

The findings of this study showed that the occurrence of infection in the area is moderate and according to the sources of water six (6) boreholes, five (5) Wells, two (2) ponds and one (1) river were observed in the town. The presence of river Wudil and other sources of water couple with the water contact behavior are factors predisposing the infection.

Out of the 150 urine samples examined, 19 were infected with *Schistosoma haematobium* (Table 1). The infection was recorded in all the three primary schools where Wudil Special Primary School had the highest prevalence (42.10%), followed by Bauchiyal Science Project School (31.5%) and KUST Staff Primary school (26.31%) had the least prevalence.

Sex related prevalence of urinary schistosomiasis was shown in (Table 2). Of the 150 children examined (102 male and 48 females), 11 (57.89%) male and 8 (42.10%) female were infected.

Table 3 showed the age related distribution of urinary schistosomiasis in the study area. The result showed that infection was highest in the age group between 5-10 years (63.15%) while the least infection was observed in higher group of 11-15 years (36.84%). No haematuria was evidently observed during microscopy of the urine samples collected from the pupils used in the study.

Occurrence of *S. haematobium* infection according to source of water by the pupils was summarized in Table 4. The result showed that the most caused of urinary schistosomiasis is river water, 15 (78.95%), 3 (15.79%) were infected through pond water, 1 (5.26%) through well and 0% occurrence was recorded in borehole water.

Table 5 showed the observed symptoms of the disease by the pupils in the study area where 40 (61.0%) reported “don’t know” and 25 (38.5%) reported “painful urination”.

Table 1: Incidence of Urinary Schistosomiasis in Pupils According to School in Wudil Town

S/No.	School	Number Examined	Number Infected	% Infected
1	KUST Staff Primary School	50	5	26.31
2	Bauchiyal Science Project School	50	6	31.57
3	Wudil Special Primary School	50	8	42.10
	Total	**150**	**19**	**100**

Table 2: Incidence of Urinary Schistosomiasis in Pupils According to Age among Primary School Pupilsin Wudil Town

Age	No Examined	No Infected	% Infected
5-10 years	87	12	63.15
11-15 years	63	7	36.84
Total	**150**	**19**	**100**

Table 3: Incidence of Urinary Schistosomiasis among Pupils in Wudil Town According to Sex

Sex	Number Examined	Number Infected	% Infected
Male	102	11	57.89
Female	48	8	42.10
Total	**150**	**19**	**100**

Table 4: Prevalence of *S. Haematobium* Infection According to Source of Water in Wudil Town

S/No.	School	Number Examined	Number Infected	% Infected
1	Borehole	20	0	0.00
2	Well	10	1	5.26
3	Pond	24	3	15.79
4	River	96	15	78.95
	Total	**150**	**19**	**100**

Table 5: Observed Symptoms of Schistosomiasis by the Respondents in the Study Area

Cause	Number (%) of Respondents
Itching	0(0.0)
Nose Bleeding	0(0.0)
Painful Urination	25(38.5)
Stomach Ach	0(0.0)
Blood in Urine	0(0.0)
Fever	0(0.0)
STD's	0(0.0)
Don't Know	40(61)
Total	**65(100)**

Discussion

The result of this study had shown that of the 150 samples analyzed, 19 were found out to be positive. The occurrence of *S. haematobium* was higher in Wudil primary School, followed by Bauchiyal Science Project School and KUST Staff primary school (table 1). According to age, the occurrence was higher in age group 5-10 years with 12 (63.15%) and total number of pupils, 87 (table 2). Also the overall incidence according to sex was higher in males (102) than females (48), which were 11 (57.89%) and 8 (42.10%) respectively. The prevalence of schistosomiasis worldwide was estimated to be > 200 million and annual numbers of death ranged from 500,000 to 1 million in Africa, Lebanon, Syria, Iran, The Arabian Peninsula and Malaysia; where it causes urinary schistosomiasis (Patrick *et al*., 2000).

Schistosomiasis affecting the urinary tract was found in the United States; only 400,000 cases were identified in 1995 (Robert and Cirillo, 2002).

The prevalence of urinary schistosomiasis among school children was investigated in a Cross- sectional study. The estimated total prevalence based on microscopic examination of single urine sample was 47.6%; this was done in Kigogo, Tanzania. Compared with the females, males recorded 54.6% to 40.8% and had in general, higher infection rates. Also, children aged 5-10 years had higher prevalence and intensities of infection than those in other age groups studied (Taylor and Francis, 2001).

The prevalence of schistosomiasis in Edo State Nigeria which covers all the local government areas in the state. Out of a total of 1,517 (22.9%) consisting of 899 (59.3%) male and 618 (40.7%) female, showed infection due to *S. haematobium*. The prevalence occurred in age group 6-11 years with infection rates ranging between 36.9% and 39.9%. This subsequently decreases with increasing age except in age group 36-40 years (Ugbomoiko, 2000).

Water contact behavior as the predisposing factor for contracting schistosomiasis has been reported by (Taylor and Francis, 2001; WHO, 2008). The present study showed that at tender age (5-10 or >), water

contact activities increase with growth in maturity. Swimming and playing, bathing and drinking of water from the river as observed from the result seemed to be the most important human water contact activity in the transmission cycle in this area. This proved to be an indication to the level of lack of excess safe drinking water source in various homes. This observation is in line with the observations of Mani (2008). Thus, concerted efforts should be made to discourage these children from contracting the contaminated water (the River).

As seen from the result with regards to the perceived cause of urinary schistomiasis which is traditionally referred to as "*Fitsarin Jini* or *Tsargiya*" by children, none of the children reported to have seen blood in their urine. This ignorance in the knowledge of the cause of the disease might be a factor responsible for the level of the infection. This implies that health education program is either not existing or poorly implemented in the area (Adamu and Musa, 2003).

Conclusion

Based on the findings of this study, it was concluded that the occurrence of the infection in Wudil town is moderate and varies with sex, age and sources of water supply. The infection occurred most in school children aged between 5-10 years. Male were mostly affected than their female counterpart. Treating them will therefore help reduce the potential of transmitting the disease as well as improving their physical fitness, school performance and general social wellbeing. The study also revealed that haematuria was not the striking symptom of urinary schistosomiasis in the area. Presence of river coupled with water contact behavior is factor that facilitated the transmission of urinary schistosomiasis in this area.

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