

A Survey of Urinary Schistosomiasis in Ikngwakap Mushere Chiefdom Bokkos Local Government Area of Plateau State, Middle Belt, Nigeria

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Abstract

Schistosomiasis is classified among the thirteen (13) diseases, as a life threatening infection among the human population by World Health Organization. The survey was carried out in Ikngwakap-Mushere Chiefdom Bokkos Local Government Area of Plateau State Middle Belt Nigeria among 200 volunteers. Microscopic examination of the urine samples were carried using standard parasitology configuration technique for the analysis. A total of 200 urine samples were examined showing prevalence of Schistosoma haematobium as 22 (11%) in the District; comprising (11.67%) males and (10) females infected. There was an insignificant difference in the distribution of the disease between males and females. 0.05% infection was among age group. 10-20 years; followed by 7.5% in 21-30 years of group, while those within the aged group of 0-1, 31-40 and above years were (0.5%) respectively. Statistical analysis shows that infection rate is different significantly. 0.05% among the various groups are prevalence in the village indicate that Kopdil, Kwales and GSS Mushere was 10% Dashung, Dimar, Kopyang and Tongder 7.5% each while no infection was recorded in Poraum and Mission compound. The prevalence in occupations shows that the highest among farmers 8 (6.7%) while 0.5% was recorded among pupils and applicants. Despite the low percentage infection recorded in both males and females, it constitutes a major public health problem in the locality thus, State Government should provide safe portable water, latrine and functional health facilities to rural communities as a means of prevention.

Keywords: Survey, Urine, Schistosomiasis, Ikngwakap-Mushere Chiefdom.

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Introduction

Schistosomiasis also known as Bilharziasis is a water borne disease caused by parasitic of the genus schistosoma, a digenitrematodes that reside in the blood vessels of man. (World Health Organization 2007, Arora & Arora 2008, 2012, Sibomana 2009). It was first discovered in Cairo Egypt in 1851, by Theoder Bilharzia, German pathologists in the blood mesenteric vein of a young man autopsy (Arora & Arora, 2008, 2012, Sibomana 2009).

There are five main species that infect human out of which four (4) causes intestinal *schistosome* these include *schstosome*, *mansonii*, *schistosoma japonicum*, *schistose mamekogi*, *schistosema intercalated* and *schistosema haematobium* that cause urinary schistosomiasis (WHO 2007, Arora and Arora 2012, Uwaezuoke et al., 2015, Goselle et al., 2010).

Schistosomiasis infection is prevalent in the tropical and sub-tropical areas, especially in poor communities without access to safe drinking water, poor sanitation facilities, poverty, ranking second to malaria and posing a threat public health and social economic threat in sub-Sahara Africa (SSA). Sibomana 2009, Abiola et al., 2015, Goselle et al., 2010).

This disease is listed among the thirteen (13) diseases classified by WHO as (Neglected Tropical Disease) (NTD). They are named so because they persist in the poorest and marginalized people who are often subsistence farmers especially living on no money and sulk poverty, with no education, simply because they are mainly in rural Areas where families depend on crude agriculture, they impair productivity. (Siboman 2009).

The disease is endemic in 79 tropical developing countries of the world. It is estimated that about 600 million people suffer from *schistosomiasis*, also more than 200 million people residing in rural

predominately agricultural areas infected and between 500 to 600 million are exposed to the infection because of poverty ignorance, poor hygiene practices, inadequate or total lack of public health facilities and non-availability of sanitary facilities (Assafa et al., 2004).

Urinary schistosomiasis is a chronic disease and cause pain to the victims with prolonged untreated infection; the ureters may become obstructed and the wall thickened leading to abnormal bladder malfunction with painful and frequent urination, urinary infection and eventually kidney damaged. (Cheesbrongh, 2004).

Bulimus Snail's species transmitted *schistosoma haematobium* which is the chief causes of urinary schistosomiasis in Africa and in the Arab world (Lucas & Gilles, 2013). It is a burden in Sub-Sahara Africa and can cause glomerulonephritis pulmonary hypertension and squamous cells carcinoma of the bladder. Anaemia and under nutrition. Schistosomiasis and anaemia in children has also been contributed to poor growth and reduced school performance. The burden of the disease causes an estimated 8-60 million disabilities adjusted to life year (daily) every year (Aason et al., 2011).

Feldmeris et al., (1998) reported an estimated 50% to 80% of girls with *schistosoma haematobium* causing genital lesion and women parasitized by those species. It is believed that genital schistosomiasis can influence infertility and cause complications in pregnancy. In this context, two problems are expected to arise, ectopic pregnancy and pathological complications of normal pregnancy leading to life-threatening: peritoneal bleeding and death have been reported from Brazil, infection of placenta may cause still birth, abortion, premature onset of labor. WHO (2007), reported 66 million children alone infected with urinary schistosomiasis in 54 countries.

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Hotezet al., (2009) reported that two-third schistosomiasis cases are due to infection caused severe urinary tract diseases. Haematobium produces bladder wall pathologies in approximately 18 million people in SSA, and 10 million in hydronephrosis. Maxwell 2008, in Hotez et al., (2009) also observed that renal failure accounts for large percentage of the estimated 150,000 deaths from urinary tractschistosomiasis in SSA, and there is also a significant association between major bladder wall pathology and squamous cell carcinoma. A significant percentage of men and women with urinary schistosomiasis acquire genital ulcers and other lesions: urogenital schistosomiasis is a significant cause of poor reproductive health including sexual dysfunction and infertility. Genital *schistosomiasis* also promotes the horizontal transmission of HIV/AIDS in SSA (Hentze et al., 2009). Ansong et al., (2011) reported *schistosomiasis haematobium* as high 60% infection in communities in a Ghana, Nkongazon et al., (2013) revealed an alarming of 69.17% prevalence of *schistosomiasis haematobium* in Berom Kotto Focal South West Cameroon: Telted et al., (2013) cited in Abiola et al., (2015) also reported the prevalence in Niakhai District of Segenal (57.6%) Eastern Cape Tozon province of South Africa (73.5%), Arborvites, Cote Devour (53.8%) Mozambique (44.7%), Daekene in Niger Republic (47.7%) the presence of *Schistosomiasis haematobium* in Nigeria has been known since 1881 from the account of German Traveler NACHTIGAL who passed through the Eastern region of Borno State, Cowpers, cited in Atlas of the global distribution in Nigeria by Pulani (Puelamherdmen) arriving from upper Nile valley (GEA ETCNRSIDMS WHO, 1987). Isaac, (2009) stated that Nigeria is one of the most severely affected countries in Africa. It is estimated that 101.28 million people are at risk of infection while 25.83 million are infected with *Schistosomiasis haematobium*. Previous work on *Schistosoma haematobium* in Nigeria cut across some States has revealed that present of the disease. A preliminary

parasitology machological was conducted in rural communities in some Local Government Area of Plateau State, Middle Belt indicated that prevalence of urinary schistosomiasis and identified active transmission foci. Out of 2888 persons examined in six (6) LGAs 1381 (47.9%) were excreting eggs of *schistosoma haematoium* in their urine; Pankshin (62.4%), Shendam, Quan'pan and Langtang South (45.4%), (40.20. Lantang North (58.9%) and Wase (50%). Akufongwe et al.,(1996), Pukuma et al., (2007), reported the prevalence of (48.9%) infection in a rural community of Waduka Lamorde L.G.A Adamawa with males (54%) and females (46.9%) (Okon et al., 2006 Agum & Banke 2006), reported 1 year old in Abini community Baise L. G. A. Cross River State. Okoli et al., (2006) reported (24.33%) in pupils in Kam/Abinese District of Guma L.G.A Benue State. The aim of the study is to survey urinary schistosomiasis in Ikngwakp Mushere chiefdom Bokkos Local Government Area of Plateau State, Middle Belt Nigeria.

Materials and Methods

Study Area

The study was carried in Ikngwakap headquarters of Mushere chiefdom, Bokkos Local Government Area of Plateau State. Ikngwakap is located about 83km from Jos the capital of Plateau State. It is a rural settlement where social amenities such as pipe borne, or borehole water are lacking. The villagers depend on various streams for their various water related activities which may be domestic and agriculture. There are also no toilet facilities; hence urination and defecation are done in nearby bush.

Study Population

The study population comprises of adults, young children both male and females between the age of 6-51 years and above in the study area. A total of 200 people were employed for these study.

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Ethical Clearance

Prior to the study survey ethical clearance was sought and received from appropriate authorities, that is from the district head, pastors and the stakeholders in the villages. They were briefed on the purpose of the research before samples collection. The subjects were asked for their age, sex, and occupation in an interview questionnaires.

Sample Collection

Each subject for the study was given one labeled sterilized specimen bottle for the collection of urine. The labeled bottles were distributed randomly to the selected people in the study areas with instruction to deposit terminal between the hours of 11am-2:00pm in the sterilizer bottles. The urine collected were tested immediately for hematuria using (combi9) strip reagent. Two-three drops of commercial beach solution were added to each of the urine sample as preservation and were transported to microbiology laboratory of Plateau State main campus Heipang for analysis (Okon et al 2007, Ngele & Okeye, 2016).

Laboratory Analysis

Thee urine samples were mixed thoroughly before transferring it at 10mls into centrifuge tubes and centrifuged at 5,000rpm for 5 minutes (Ngele & Okeye, 2016). The supernatant was discarded and the deposit or sediment was transferred to a clean grease free slide (Ngele & Okeye, 2016). It was then covered with coverslip and examined microscopically, with 10x objectives identification of ova or eggs of *schistosoma haematobium* in the specimen.

Data Analysis

Chi-square was used to determine whether any relations exist between en-parasites ova, cyst and contamination of different.

Results

A total of 200 urine samples were collected and examined for *schistosoma haematobium* out which 22 were positive giving a total prevalence off 11%. The distribution shows that fourteen (14) males were positive for *schistosoma haematobium* (1.16%) and eight (8) females positive (10%) (Table 1). It shows that there was significant difference $p > 0.05$, in the infection rate among gender.

Table 2: shows the relationship between age group and prevalence of *schistosoma haematobium* in the study area. The highest prevalence of (10%) was recorded age group of 11-20 years followed by (7.5%) in 21-30 years of age, where as those within the age group of 0-11, 31-40, 41-50, 51 and above years were (05%) respectively. Statistical analysis shows that infection rate different significantly $p > 0.05$, among the various group in the area.

Table 3: Shows the distribution of *schistosoma haematobium* in the villages with Kopdil, G.S.S Mushhere and Kwales (10%) having the highest prevalence infection rate followed by Dangshang (7.5%), Kopyang, Dimar and Tongder (05%) each. Statistical analysis shows significant different $p > 0.05$ in rate of infection in the villages.

It was observed that in farming occupation had the highest prevalence of (19.05%) followed by (98.3%) among students, and will servant (6.67) with least (05%) infection in pupils and applicant. There was a significant $p > 0.05$ in the infection among the various occupation (Table 4).

Table 1: Distribution of urinary schistosomias is according to gender in the study area.

Sex	Number Examined	Number Infected	Prevalence (%)	χ^2	pvalue
Males	120	14	14(11.67%)	0.136	0.712
Females	80	8	8(10.0%)		
Total	200	22	22(11%)		

Table 2: Distribution of Urinary Schistosomias is according to age in the study Area.

Age Group (Years)	Number Examined	Number Infected	Prevalence (%)	χ^2	pvalue
1-10	40	2	2 (05%)	1.395	0.925
11-20	40	4	4 (10%)		
21-30	40	3	3 (7.5%)		
31-40	40	2	2 (0.5%)		
41-50	20	1	1(05%)		
51 & above	20	1	1(05%)		
Total	200	13	13 (6.5%)		

Table 3: Distribution of Urinary schistosomias is according to the villages in the study

Villages	Number Examined	Number Infected	Prevalence (%)	χ^2	pvalue
Kopyang	20	2	2 (05%)	8.303	0.404
Kopdil	20	4	4 (10%)		
Dangshang	20	3	3 (7.5%)		
Dimar	20	2	2 (05%)		
Tongder	2	1	1 (05%)		
Poram	20	0	0 (00%)		
Mission compound	20	0	0 (00%)		
Kwales	20	2	2 (20%)		
G. S. S. Mushere	40	4	4 (6.5%)		
Total	200	13	13 (6.5%)		

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Table 4: Distribution of urinary schistosomiasis according to occupation

Occupation	Number Examined	Number Infected	Prevalence (%)	χ^2	pvalue
Farmer	42	8	8 (19.05%)	6.966	0.138
Civil servant	30	2	2 (6.67%)		
Students	48	4	4 (8.3%)		
Pupils	60	3	3 (5.0%)		
Applicants	1	1	1 (5.0%)		
Total	200	18	8 (9.0%)		

Discussion

The result of this study has demonstrated the existence of urinary schistosomiasis in Ikngwakap District of Mushere-Chiefdom, Bokkos Local Government Area, Plateau State, Middle Belt Nigeria.

The survey on the prevalence of urinary *Schistosomiasis* in Ikngwakap was carried out between December 2017 and March 2018. Among the 20 persons examined in the study revealed overall prevalence in the study area.

The overall prevalence of 11.67% *Schistosomiasis haematobium* recorded in the study area confirmed presence of the disease. The prevalence appears relatively low in the area; however, this may constitute public health hazard as it could increase unless curtailed early. The prevalence reported in this study is higher than those reported by other researchers (Uwaezuoke et al., 2007, Ukpai & Ezekiel, 2002).

Result obtained shows variation in the distribution of urinary schistosomiasis infection in relation to sex, age location and occupation. The 11.67% overall prevalence rate of urinary schistosomiasis is observed

in the research is in conformity to previous finding in Nigeria Akufon et al., (1996), revealed the overall prevalence of 47.93% in six (60 LGAs of Plateau State, they also reported the prevalence of urinary in these six LGAs as follow: Pankshin 62.4%, Shendam 42.2%, Lantang North 50% and Wase 50%. Okpala, et al 2004), reported 0.05% among some private primary/secondary schools in Apata Jos, Plateau State Nigeria; Uwaezouke et al., (2007) 8.1%, with 32 (8.9%) in males and 27 (7.2%) in females, 9.2% among the age group between 11-2 years infection in Imo State. Agum & Banke (2006) noted prevalence of urinary schistosomiasis is from five (5) selected primary schools in Guma L.G.A of Benue State had the overall prevalence of (24.33%), males and females recorded (27.03%) and (21.71%) respectively. Pukuma & Musa (2007) observed to have the overall prevalence of 48.0% of those examined were infected. The males were observed to have a prevalence rate of (52.0%) than females (46.0%), it was observed that resident within the age group of 10-20 years (52.0%) were the most infected while the least (37.5%) was recorded in resident aged 41 years (52.0%) and above. Infection in relation to occupations, fishermen (65.2%), farmers (50.75%), students (48.3%) were the most infected people and civil servants (33.3%). Prevalence in Wadukuin Lamadre L.G.A of Adamawa State. Okoli (2006)

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reported (11.3%) prevalence in some communities of Ahagi/Egbena L.G.A of Imo State. Okon et al., (2007) also reported prevalence of urinary schistosomiasis 40 (39.2%) in males, females 30 (30.6%) in Abini (2009) recorded (18.3% in ABU Saramu Zaria, Kaduna State. Ngele et al., (2016) noted the prevalence of urinary schistosomiasis as (44.84%) in Agu L.G.A of Enugu State Nigeria. The prevalence in respect to their age 189 (60.97%) children between 12-14 years were most infected with schistosomiasis 46 (14.84%) while 3-7 years had the least prevalence (9.86%) of urinary schistosomiasis. Community Baise L.G.A of Cross Rivers State, Nigeria. Isaac (2009) recorded.

A similar finding of urinary schistosomiasis infection has been reported in Ghana rural setting in 2011. The overall prevalence of 41.1% was rerecorded the highest prevalence was in the age group of 10-14 years (71.0%) with lowest among age group of 30-54 years (Asong et al., 2011).

These similarities in this overall prevalence in various studies in Nigeria and Ghana indicate similar water related practices in the various localities, state and countries by the people. More so, majority of the people deepened on stream, pond and rivers source of water supply, prevalence of urinary schistosomiasis which is probably due to indiscriminate urination and defecation in the near bush by the people possibly also contributed to the prevalence rate reported in this study.

In the study males had the highest prevalence rate of infection than females which might be due to the fact males are more exposed to infection during the research, because activities such as swimming, farming, and playing in streams, rivers, ponds unlike the females whose activities with water are mainly fetching of water and washing, more for females are always shy or scared of swimming. This finding agrees with those of Dakul (1999), Uwaezuoke et al., (2007), Pukuma & Musa (2007). Although,

statistical analysis showed the infection did not vary significant. Subjects within age group of 11-20 years were more infected. The contributed to their engaging in swimming, or playing in rivers, streams or ponds. There was slight difference in infection rate among the various villages studied. The distribution of infection in relation to occupation showed that farmers were most infected (19.5%), followed by students (8.3%) whereas lowest infection was most among pupils and applicants. This also agreed with the result obtained in Adamawa State by Pukuma & Musa (2007).

Conclusion

This study has shown that urinary schistosomiasis is endemic in Ikngwakap-Mushere Chiefdom Area though of low prevalence. This observation is of public health significance and could be a threat to socio-economic important activities in the area.

If not quickly checked, there is urgent need therefore for the Local Government, State Government as well as Federal Government to established control programmes in the area.

Recommendation

Schistosomiasis, as with many communicable disease is as a result of inequality and poverty people get infected because they do not have access to safe, portable water and maintain transmission because of absence of proper excerptor and rune disposals system.

1. The Federal, State and Local Government should provide safe water latrine and health facilities to rural communities.
2. Public enlightenment on the method of transmission and danger of the disease by Federal, state ministry of health and health department of L.G.A.
3. Health Education campaigns in rural communities, environmental sanitation,

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personal hygiene should be introduced and laws be enacted and enforced on all the citizens to curb the transmission and spread of the disease.

4. Improving the social-economic conditions of citizen in communities will no doubt enhance the control of Schistosomiasis, harm or danger and mortality caused by worms through provision of wells, boreholes by well spirited individuals and non-governmental organization
5. Free screening of citizen in the communities, administration of anti-Schistosomiasis medicine could play an important role in reducing the infection in the countries.

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