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Gender and Age-specific Prevalence of Urinary Schistosomiasis among Three Communities of Kontagora Local Government Area, Niger State, Nigeria.

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ABSTRACT

This study was carried out to determine the prevalence and intensity of urinary schistosomiasis among three communities in Kontagora Local Government Area, Niger state, Nigeria. A total of 200 urine samples were collected and processed using filtration technique for the presences of Schistosoma haematobium eggs. Out of the samples collected, the overall prevalence of the infection was 65.5%. The gender prevalence showed that males had the highest prevalence of 72.34% compare to female with 49.08%. The age-specific prevalence revealed that subjects at age bracket 10-20 have the highest prevalence of 81.82% and the least prevalence of 34.48% was recorded in subjects at age bracket>40. The results of this study revealed that the study area is endemic with S. haematobium infection. Therefore, there is the need for government and non-governmental organizations and concern individuals to embark on control measures against the disease so as to effectively eradicate it from the study area.

Keywords: Prevalence, Intensity, Urinary Schistosomiasis, Kontagora.

1.0 INTRODUCTION

Schistosomiasis refers to the disease acquired from parasitic blood flukes that belong to the genus *Schistosoma*. Urinary schistosomiasis also called Bilharziasis is a parasitic disease caused by a digenic blood fluke of genus *Schistosoma* called *Schistosoma haematobium* and it is transmitted by a specific fresh water snail (Ladan *et al.*, 2012). The disease is the second most prevalent neglected tropical disease after hookworm (Hottez and Kamath, 2009) and remains an important public health problem globally especially in the Sub-saharan Africa (Ishelekue*t al.*, 2012).

The parasite belong to the class trematoda of Phylum Platyhelminthes under Kingdom Animalia, belonging to the genera *Schistosoma* which has four (4) species that include *Schistosoma mansoni* which causes intestinal schistosomiasis, is wide spread in Africa and occurs in the Arabia Peninsula, South America (Brasil, Venezuela and Suriname) and Caribbean (including Puerto Rico but not Cuba). According to Tierney *et al.*(2005), other species include *S. japonicum* found in the central Africa, *S. mekongi* found in the Mekong delta in

Thailand, Cambodia and Laos. The final species is the *S. haematobium* which causes vesicular (urinary) schistosomiasis which is widely spread in Africa, and other parts of the world like the Middle East (Ladan *et al.*, 2012). It is estimated that there are 207 million cases of schistosomiasis worldwide of which 93% occurs in the Sub-Saharan Africa (about 192 million) (Ishelekue*t al.*, 2012). About 10million individuals are at risk of the infection, and about 70million individuals with haematuria (blood in urine), 32 million experiencing difficulty in urination (dysuria), 18 million with bladder-wall pathology, and 10 million with major hydronephrosis from infection caused by *S. haematobium* (Ekpo*et al.*, 2010). Mortality rate due to non functioning kidney from *S. haematobium* infection and haematenesis has been put at 150,000 per year. The figure implies that urinary schistosomiasis is an important public health in Sub-Saharan Africa and second to malaria (Ekpo*et al.*, 2010).

Human infection with schistosomiasis occurs through direct penetration of unbroken skin by cercariae which invade the circulatory system. According to Robert (1992) as cited by Ladan *et al.* (2012) within 24hours of infection, cercarial dermatitis may occur at the site of cercarial penetration. Patients frequently suffer from abdominal pain, fever, malaise, urticaria, bloody diarrhea, myalgia, and dry cough e.tc. The severity of the disease alerted Federal Ministry of Health to establish the Natural Expert Committee for Surveillance of Urinary Schistosomiasis in August 1988, in order to determine the prevalence of disease rapidly to enable the government to develop feasible control strategies. Schistosomiasis principally affect people who are unable to avoid contact with natural water sources, either because of lack of reliable water for domestic uses or inadequate knowledge about the disease (Adeleke, *et al.*,2011). Although the occurrence of urinary schistosomiasis in Nigeria has been documented in several areas, its distribution remains inadequately understood (Uwaezuoke *et al.*, 2007). This is because the national programme for its control has not been sustain due to some factors including non-recognition of the disease by the great majority of the population of the public health importance and lack of political will by the policy makers to invest in control of the disease as such a significant number of victims have therefore been excluded from the studies (Nale *et al.*, 2003; Ladan *et al.*, 2012). Furthermore, there is a dearth of information on the transmission of the disease and its concomitant mobility in some part of the Northern Nigeria (Ladan *et al.*, 2012). The prevalence and distribution of such disease remain unknown in most of the areas in the geographical zones, especially in the rural areas of Niger State where most families are engaged in subsistent farming and fresh water fishing and most of the residents depend on the river for other water related activities in addition to People's behaviour of defecating and urinating in or around water bodies. It is in this light, that this study was carried out to determine the prevalence and intensity of urinary schistosomiasis in some communities of KontagoraLGA. The data obtained from this study is expected to provide baseline information which will form basis of a control program in the area and country at large, and also to provide room for other researchers to continue until a comprehensive picture of the situation is portrayed.

1.1 Objective of The Study

The specific objective of this study is to determine the prevalence and the intensity of urinary schistosomiasis with respect to gender and age of the inhabitants.

2.0 MATERIALS AND METHODS

2.1 Study Area

Kontagora Local Government Area is along the South bank of the Kontagorariver in the Northwest Niger state, Nigeria. Kontagora is located on Latitude 3° 201 and 7°401 East and longitude 8° and 11°31 North, and is within the Northern guinea savannah (Ibrahim *et al.*, 2009).

Kontagora experiences two seasons, the wet and dry seasons. The average annual rainfall is about 1,400mm. The duration of the rainy season is approximately 180 days. Mean average temperature hovers around 32°C, particularly in March and June. December and January have the mean lowest temperatures due to the influence of the tropical continental air mass which blows from the North. Dry season commences in October (Ibrahim *et al.*, 2009). The three communities that were randomly selected for the study were Sabongari, Matachibu and Unguwantukura. All the three communities are located near river Kontagora. The major preoccupation of the selected communities is farming, in addition to public servants, traders, fishermen and artisan that inhabit the areas. Hausa, Kambari, Fulani and Basawa are the major ethnic groups of the areas. Their culture is similar; their water sources for domestic and agricultural uses are rivers, ponds, and some few open wells. The few bore-holes available in some parts were non-functional due to lack of proper maintenance. There were lack of general basic health and sanitary infrastructures in the areas such as standard healthcare units, portable water etc.

2.2 Ethical Approval

Approval for this study was obtained from the State Ethical Committee on Infectious Diseases of the Federal Medical Centre, Bida through Kontagora Local Government Council Authority, and from the authorities of various Head of the communities as well as parents and other relevant stakeholders in the community. The approval was on the agreement that participants' anonymity must be maintained, good laboratory practices, and that every finding would be treated with outmost confidentiality and for the purpose of this research only.

2.3 Sample Collection and Questionaire Administration

Pre-survey visit was first conducted in the area of the study to obtain consent, sensitize the public and encourage volunteers in the participation of the study. Each specimen bottle was leveled in order to obtain the required information such as village name, ages and gender from each individual that participated. Specimen bottles (clean, sterile universal containers) were then distributed between 10:00am – 12:00pm at random to obtain the urine. When the specimen bottles containing the urine were retrieved, some drops of 10% of formalin (Formaldehyde solution) were added in the urine sample for preservation.

The subjects were also asked to provide information about their personal data, such as village name, ageand gender. All collected samples were transported to the Parasitology Laboratory, in the Department of Biological Sciences, Usmanu Danfodiyo University, Sokoto for analysis.

2.4 Analysis of Urine

The two hundred urine samples collected were processed using standard filtration technique as described by Bello *et al.*, (2003) and Ladan *et al.*, (2012). This method involved the use of vacuum-pump filtration machine (Millipore Corporation Bedford, Massachusetts 01730 USA) coupled to a filtration unit.WhatmanNo.1 filter paper (5.5cm diameter) was inserted into the filtration unit. The urine sample was thoroughly mixed and then 10ml of the urine was withdrawn with 10ml syringe and

transferred into the filtration unit of the machine. The machine was switched on to drain the urine through the filter paper by suction, the filter paper was removed carefully by the use of pair blunt ended forceps and place on a clean sheet of paper. Some drops of ninhydrin and iodine solution were also added to enhance staining. The filter paper was then left for 3hours at room temperature for the eggs to pick up the stain (Bello *et al.,* 2003;Ladan *et al.,* 2012). After three (3) hours the filter paper was placed on a clean glass slide and examined systematically under the light microscope, using 10x objective. Terminal spine eggs, characteristic of *S. haematobium* were counted for each positive sample. The result was expressed as eggs/10ml of urine as describe by (Ladan *et al.,* 2012). All the urine samples were treated in the same way.

2.5 Analysis of Data

The data obtained were analyzed using descriptive statistics and a chi-square (χ^2) analysis was used to compare the association between infection and parameters (gender and age). However, tables were drawn to show the prevalence and intensity of the infection.

3.0 RESULTS

3.1 Prevalence and Intensity of Urinary Schistosomiasis with respect to Gender

Out of 200 urine samples examined, result obtained showed highly significant association (P>0.05) between prevalence of infection and gender of the subjects. The highest prevalence of 72.34% was recorded in males than their female counter partswith 49.15%. However, the intensity of the infection was also found to be higher in males 31.23 eggs/10ml, than in the females 28.69 eggs/10ml (Table 1).

Table 1: Prevalence and Intensity of Urinary Schistosomiasis with respect to Gender

Gender	No. examined	No. positive	Prevalence (%)	Mean egg count/10ml (intensity).
Male	141	102	72.34	31.23
Female	59	29	49.15	28.69
Total	**200**	**131**	**65.50**	**59.92**

χ^2=7.879; *df*=1; P>0.05

3.2 Prevalence and Intensity of Urinary Schistosomiasis with respect to Age Groups

The age-specific prevalence revealed that subjects at age bracket 10-20 have the highest prevalence of 81.82% followed by those aged 21-40 with 64.08% and >40 had the least prevalence of 35.48%. A Chi square analysis shows significant association (P>0.05) in prevalence of infection among the age groups. The highest mean intensity of infection was also recorded in age bracket 10-20 with 35.96 eggs/10ml, followed by 21-40 years with 13.98 eggs/10ml) and those above 40 years has the least mean intensity of 9.98 eggs/10ml of urine (Table 2).

Table 2: Prevalence and Intensity of Urinary Schistosomiasis with respect to Age Groups

Age Groups	No. examined	No. positive	Prevalence (%)	Mean egg count/10ml (intensity)
10-20	66	54	81.82	35.96
21-40	103	66	64.08	13.98

›40	31	11	35.48	9.98
Total	200	131	65.5	59.92

χ^2=10.597; *df*=2; P>0.05

3.3 DISCUSSION

The results of this research finding have indicated that the study area is endemic with infection. The higher prevalence of 65.5% and intensity of 59.92eggs/10ml was attributed to intense water contact activities of the inhabitant in area. This finding is in line with other researchers like Ladan *et al.*, (2012) in their study on urinary schistosomiasis in selected villages around Gusau dam site, Zamfara state. The study areas are rural communities who depend on rivers, ponds, wells, and dams for their water related activities such as bathing, washing and other domestic uses. Most of these water bodies are the main transmission foci in the community and are distributed within the area, they provide natural water source and also serves as nidus for the schistosome parasites and snail intermediate host where people interacts for their various activities. These ensure that the people continue to be infested and re-infested since no intervention strategy has been carried out in the area.

The male showed higher prevalence (72.34%) of infection compared to females with 49.15% which could be due to the fact that males have the higher rate of exposure to infested water through swimming, irrigation, bathing, playing, and other activities than their females counterparts. Similar findings have been reported by Ishalekue*t al.,* (2012) in their work on *Schistosoma haematobium* infection among school children in Keffi town, Nassarawa state.

The prevalence with respect to age group revealed that, those people within the age group of 10-20 years had the that higher prevalence of 81.82%. This may be due to the fact that people at this age are more engaged in various water contact activities such as swimming, washing, bathing, farming, irrigation etc. Similar findings have been reported by Akogun and Obadian, (1996); Ladan *et al.,* (2012). Another important factor that might have attributed to infection among younger children is their weak immunity. The lower prevalence in the age group of >40 might be due to less water contact activities, improved hygienic habit and improved immunity as reported by Adeboye, (1994) as cited by Ishelekue*t al.* (2012), in his work on *Schistosomahaematobium* infection among school children in Keffi town, Nasarawa state.

The establishment of water sources development project has been associated with outbreaks of schistosomiasis in many parts of Tropical Africa. Although the development of water sources is overall immensely beneficial to a developing country like Nigeria which seeks to boost agricultural production to feed its growing population, evidence about to has shown that the planning, design and execution of such project are often undertaken without considering their health implication (Adelekee*t al.,*2012).

Human habits, such as passing excreta and urine in or near water bodies, religious practice such as washing body parts five times daily during ablution by muslims, and baptism bathing in the rivers by Christians are other important factors for transmission and spread of schistosomiasis (SarkinFadae*t al.,* 2009).

4.0 CONCLUSION

Conclusively, the results obtained from this study, indicated that the study areas are endemic with schistosomiasis. It is obvious that ignorance play a vital role in the spread of the infection in the study areas.

Therefore, government intervention is highly needed to effectively control and prevent the spread of the infection through health enlightenments and mass drugs administration in the study areas.

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