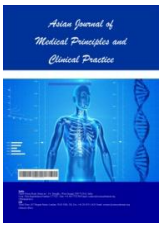

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Urinary Schistosomiasis in Some Otukpo Communities in Otukpo Local Government Area of Benue State Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Authors VUO, EMV and EUA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors VUO and EMV managed the analyses of the study. Authors VUO and VCU managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

This study was carried out to investigate the prevalence of urinary schistosomiasis in three communities in Otukpo Local Government Area of Benue State. It identified risk factors, determined the most affected gender and age groups among the three communities, it also identifies indigenous control measures used and their efficacy. Questionnaires administered showed that the community with the highest infection had more contact with parasite infested water. One hundred and thirty nine (139) urine samples were collected from communities and examined for *Schistosoma* ova using the standard microscopy. Results showed a total prevalence of 4.3%, highest prevalence of schistomiasis 7.1% in male's age groups of Il-20years than the females 6.7%.Two water activities bathing and washing were mainly responsible for the transmission. Remedies used to treat schistotsomiasis included Orthodox and herbal. Therefore, necessary control measures must be taken to reduce the communities contact with cercariae in parasite

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infested water. Washing and swimming in water bodies that could possibly contain the infective parasite. Also, individuals should get themselves treated as soon as they notice symptoms of the disease.

Keywords: Urinary; schistosomiasis; treatment; community contact.

1. BACKGROUND OF THE STUDY

Schistosomiasis also known as bilharzia, snail fever, and katayama fever is a disease caused by parasitic worms of the *Schistosoma* type. It may infect the urinary tract or intestines. There have been several reports on *Schistosoma haematobium* infection in Makurdi [1] Benue Nigeria. This prompted the need to investigate the prevalence in Otukpo which is the next bigger town after Makurdi. In terms of impact this disease is second only to malaria as the most devastating parasitic disease. Schistosomiasis is considered as one of the Neglected Tropical Diseases (NTDs). Urinary bilharzia (urogenital Schistosomiasis) is caused by a digenetic trematode of the genus *Schistosoma* whose intermediate hosts (vector) are fresh water snails of the genus *Bulinus* [2].

2. MATERIALS AND METHODS

2.1 Study Area

This research was carried out in Otukpo local government area of Benue State. Otukpo Local Government Area is one of the Local Government Areas in Idoma land, the Headquarter of the Idoma people. Otukpo has a land mass of 390 sq.km and estimated population of 345, 435 [3]. Otukpo is centrally located between the Tiv, in Benue State and the Igala area of Kogi State, bounded in the north by Apa and Ohimini Local Government Area in the South East Ado Local Government in the South and Olamaboro Local Government in Kogi State in the West.

2.2 Study Population

After successful advocacy visits to the study area. Different Households were systematically selected from each of the 3 communities examined in Otukpo but a maximum of 3 Pupils were randomly sampled by ballot method from a household. Eventually each community contributed to the sample population of 139.The subjects were studied under five groups, based on three communities (Eupi, Ampia and Edikwu); male and female gender; age groups (≤ 10 years, 11 to 20 years, 21 to 30 years, 31 to 40 years, three main family occupations (farming, trading and public service), and three main family sources of water supply (Stream, Well, and Pipe-borne water).

2.3 Data Collection Techniques

Specimen bottle was taken to the three (3) different communities as early as 8.00am and given to selected persons with the instruction to collect the first and last parts of the urine during which parts is believed that the infected individuals usually pass the ova in urine which sediment in the bladder and ready to pass out with the urine at this time. All specimen bottles were marked for sex and age differences to prevent mixing specimens.

The specimens were collected from each individual taken note of the colour of the urine and carefully arranged in a container.

2.4 Laboratory Analysis

Urine sample was obtained from 81 males and 48 females. A 10 ml clean and sterile bottle was given to each person and urine collected was placed in a container. Samples were collected between 9.00am and 10.00am of the days were taken to a standard laboratory for urine colour diagnosis and examination.

2.5 Specimen Analysis

A total of 139 urine samples were collected from the three communities. The samples were centrifuged at 5000 revolutions for 5 minutes. The supernatants were discarded to leave sediments which were transferred to a clean grease- free glass slide and covered with cover slips. The slides were viewed under light microscope at magnification of XI0 and X40 objectives. Schistosoma *haematobium* eggs were identified by presence of a terminal spine. To avoid false positive results, each person was made to use fresh specimen bottle.

One to fifty (1-50) eggs per 10 ml of urine were considered as light infection, 51-200 eggs per 10

ml of urine and above 200 eggs per 10 ml of urine were considered as moderate and heavy, respectively [1].

3. RESULTS

Out of 139 persons examined for *Schistosoma haematobium,* 6 were found to have light infection (Table 1). There was low intensity of *S. haematobium* eggs in relation to age and sex. Age group 11-20 had 2 eggs in both sexes which was the highest group; while age group 31-40 and 21-30 had 1 egg each in male and female respectively. *S. haematobium* infection among people in relation to communities in Otukpo, was as follows; Eupi, 6.5%> Sabongari 2.7%> Ampia 2.5% (Table 2). Four (4) out of 62 persons examined, 1 out of 37 persons examined, and 1 out of 40 persons examined had eggs in Eupi, Sabongari, Ampia respectively. Age groups; 11-20, 21-30, showed light infection in Eupi, In Sabongari, the prevalence *of S. haematobium* was in age group 11-20, while those between 0<10, 21-30, 31-40, were of zero percentage (0%). Ampia had light infection in age group 11-20 while the rest age group was relatively zero percentage (0%). Table 4 showed prevalence in relation to activities with water. 10% of people examined in Eupi that bathed from the stream (n=30) had light infection, 10% (n=10) of those that wash in stream had light infection, while fishing had 0% (n = 2).

Fig. 1 showed method of treatment. 65%, 29% and 6% orthodox, herbal and no treatment respectively. Fig. 2 showed seasonal abundance of snail. Seventy two percent of the (72%) respondents state that snails are seen in all season while 28% had it that it is common in rainy season.

Table 1. Intensity of *Schistosoma haematobium* eggs in relation to Age and Sex in Otukpo

Sex	Age groups (Years)							
	0 ≤ 10		11-20		21-30		31-40	
	NE	NI(%)	NE	NI(%)	NE	NI(%)	NE	NI(%)
MALE	11	0(0)	49	2 (4.1)	7	0 (0.0)	1	(0)
FEMALE	18	0(0)	33	2 (6.1)	8	1 (12.5)	2	1(50)
Total	29	0(0)	82	4 (4.9)	25	1 (4.0)	3	1(33.3)

$x^2cal = 2.003,\ df = 3, p > 0.05$. *There is no significant difference*

Table 2. Intensity of *Schistosoma haematobium* infection among people in relation to community

Communities	No examined	Light	Heavy
Eupi	62	4 (6.5)	0 (0.0)
Sabongari	37	1 (2.7)	0 (0.0)
Ampia	40	1 (2.5)	0 (0.0)
Total	139	6 (4.3)	0 (0.0)

$x^2cal = 0.288, \quad df = 6, p > 0.05$

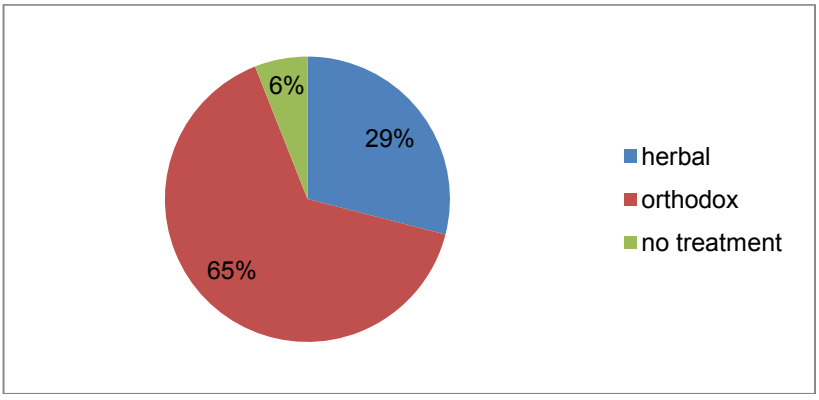

Fig. 1. Method of treatment of *Schistosoma haematobium* in Otukpo

Table 3. Age related prevalence of *Schistosoma haematobium* among the community

Communities	Age groups (Years)							
	0 ≤ 10		11-20		21-30		31-40	
	N.E	N.I (%)	N.E	N.I (%)	N.E	N.I (%)	N.E	N.I (%)
Eupi	12	0	31	2 (6.4)	19	1 (5.3)	0	0 (0)
Sabongari	9	0	24	1 (4.2)	2	0 (0.0)	2	0 (0)
Ampia	8	0	27	1 (7.4)	4	0 (0.0)	1	1 (100)
TOTAL	29	0	82	4 (6.2)	25	1 (0.0)	3	1(3.3)

$x^2cal = 6.560, \quad df = 10, p > 0.05$

Key: N.E. = Number examined, N. I. = Number Infected, (%) prevalence

Table. 4 Activity with river/stream related prevalence of *Schistosoma haematobium* among the community

Communities	Activity							
	Bathing		Washing		Fishing		Mixed	
	N E	N.I (%)	N E	N.I (%)	N E	N.I (%)	N E	N.I (%)
Eupi	30	2 (6.7)	10	1 (10)	2	0 (0)	10	0 (0)
Sabongari	22	1 (4.6)	10	0 (0)	30	0 (0)	8	0 (0)
Ampia	18	1 (5.6)	10	1 (10)	4	0 (0)	12	0 (0)
Total	70	4 (5.7)	30	2 (6.7)	36	0 (0)	30	0 (0)

$x^2cal = 4.961, \quad df = 6, p > 0.05.$

Key: N.E. = Number examined, N. I. = Number Infected, (%) prevalence.

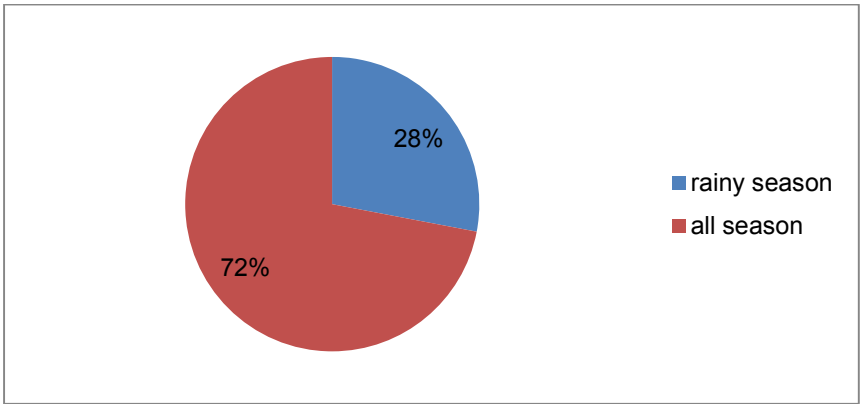

Fig. 2. Seasonal Availability of Snail Intermediate host of *Schistosoma haematobium*

4. DISCUSSION

The study focused on investigation of the current prevalence of urinary schistosomiasis in Otukpo. It reviewed a prevalence of 4.3% which is very low compared to 25.74 reported in Makurdi Benue State [1] also the prevalence recorded in this study is very low compared to 45.4% and 42.3% reported in Aninri in Enugu State and Abia State respectively [4,5]. This study showed a variation in infection (light infection) among the groups in the communities sampled. The light intensity observed in this study is in contrary to light to heavy intensity observed in Makurdi Local government area of the same Benue State [1].

The highest infection rate occurs in the age groups of 11-20. This corresponds with a previous observations in Oju Local government Area of Benue Nigeria [6] which reported age group 11-15 as the group with the highest prevalence of urinary schistosomiasis in Oju Local government area of Benue State. Individuals less than the age of ten (10) and adults were found to have the lowest infection rate with peak in those more than ten (10) and nineteen (19) years. The progressive increase in infection rate with increase in age was explained on the basis of possible frequency of contact with the parasite infested water (i.e. Rivers, streams and ponds).

The distribution of urinary *schistosomiasis* amongst school children and individuals examined was not uniform. The males had a higher infection (7.1%) rate than the females (6.5%). This maybe because boys have more contact with water bodies that are likely to harbor effective cercariae, this age group were observed to be very adventurous and actually seen in the river swimming without shyness. Furthermore girls become more mature quickly than the boys such that they will not like removing their clothes before swimming together with their male counterparts as such they prefer staying away from swimming. There was no significant difference in gender related prevalence (P>0.05). This is in line with report from similar geo-ecological areas in Southern Nigeria [7,8,9,10]. Statistical analysis shows that the result obtained was not significant as the calculated value x^2cal was less than the tabulated value x^2tab. This indicates a decline in the infection rate, this decline maybe attribute to rapid advances in the health care delivery system and marked improvement in the standard of living in the pupil and individuals which greatly reduce their chances of contacting the foci of infection which in most cases are rivers and streams from where water for domestic purpose is obtained.

The highest infection rate recorded in Eupi community (6.5%) when compared with others may be due to its nearness of Eupi stream called (Okpaeupi) where the intermediate host the *Bulinus trucatus* snails are likely to be identified. Previous report [11] confirmed that human water activities were important predisposing factors to *Schistosoma* infection especially when the right species of snails were present. About 52.7% of infected persons in Kano State exhibited high level of water contact. The large majority of the people in the study area adopt the orthodox medicine as their method of treating schistosomiasis. This could be attributed to the level of awareness in the communities. On the seasonal availability of freshwater snail, it was reported that the freshwater snails are seen at all seasons in the area. This however did not affect the prevalence of urinary schistosomiasis in the communities.

5. CONCLUSION

From the data obtained, there were no heavy infections in the communities sampled. Though light infection was recorded in some age group. This could be traced to some levels of awareness created by Benue State's Ministry of Health through its Mass Drug Administration campaign.

CONSENT

Informed consent was obtained from parents and guardians to enlist their wards in the study.

ETHIVAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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