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A PRELIMINARY SURVEY OF THE PREVALENCE AND INTENSITY OF URINARY SCHISTOSOMIASIS AMONG SCHOOL CHILDREN IN AKPET –CENTRAL, BIASE –NIGERIA

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ABSTRACT

The prevalence and intensity of *Schistosoma haematobium* was investigated among 400 pupils in Akpet –Central Biase-Nigeria. Intensity of infection was measured by filtration technique while proteinuria and haematuria were measured using Bio-scan reagent strip. Result of this study confirm Akpet central as an endemic area for urinary schistosomiasis. The prevalence of infection stood at 850(42.5%). Male subjects had a higher prevalence (57.7%) as against (36.3%)for females. However statistical analysis did not show any significant difference in the prevalence of infection by sex (P>0.01). The peak age prevalence occurred among subject aged between 7 and 14 years. The findings of this study are being exploited for interventional measures aimed at controlling schistosomiasis in this hitherto undiscovered endemic focus.

INTRODUCTION

Schistosomiasis is caused by digenetic blood trematodes. Three main specie infect humans, which are *Schistosona haematobium*, *Schistosoma japonicum*, and *Schistosoma mansoni*, *Schistosoma intercalatum* and *Schistosoma mekongi* are more localized but also infect man. In addition, other species of schistosoma, which parasitized birds and mammals, can cause cercarial dermatitis in humans (WHO, 1987).

Schistosomiasis is the second most prevalent tropical disease and leading cause of morbidity in several foci in Africa, Asia and South America (Cowper, 1984; Chitsulo *et al*, 2000). Five hundred to six hundred million in 74 tropical and sub-tropical countries are at risk of schistosomiasis. Over 200 million are symptomatic, with 20 million having severe clinical disease (WHO, 2002).

Although Schistosomiasis not the most serious of disease in the tropic compare to malaria, diarrhea, acute respiratory infection and malnutrition, the fact that it is wide spread particularly in young populations and the chronicity of the disease which has made it difficult to determine its impact on overall incidence in endemic area deserves close attention (Mott, 1990).

Two major factors stabilizes the endemicity of schistosomiasis in the developing world. One of such factors is its tropical location, which is associated with warmth and humidity, a condition that is very conducive for the transmission of infectious disease. The other factor is poverty which results in malnutrition, crowding, lack of water and sanitation (Warren, 1994). Pathology of *Schistosoma haematobium* schistosomiasis includes: haematuria,scarring calcification, squamous cell calcinoma,and occasional embolic egg granulomas in brain or spinal cord(Cetron,*et al*, 1996).

MATERIALS AND METHODS

STUDY LOCATION.

This study was conducted on pupils of Akpet-Central Primary school of Biase Local Government of Cross-River State.

The area is situated towards the central senatorial district of the state, about 120KM from Calabar the state capital.

Akpet-Central has equatorial rain forest vegetation with partially cleared bushes in close proximity to human dwellings. Due to the absence of pipe-borne water, the residence utilizes fresh water streams scattered in the area for both their economic and domestic needs.

Economic activities in this area include farming petty trading and cassava processing, rice farming and small scale fishing is also practiced in this area. Houses are not properly designed mostly made of mud bricks some having cracks and crevices all over. Most of the people move about barefooted and even defecates in nearby bushes.

Sample Collection and Laboratory Analysis

Children between the ages of 5-16 years were used for the study. Selection of pupils was done by queuing them up according to their height systematically from primary 2-6. Samples were collected from all the pupils in these classes except for those absent. Pupils in primary one were not included for the study as teachers found it difficult to organize them for sample collection.

Urine Collection

Urine samples were collected into clean universal containers between 10 am and 2 pm when high egg out put are usually detected (Pugh, 1979). After vigorous agitation, 10mls of urine was removed into another universal container containing 5mls of 1% aqueous solution of carbol fucshin using a disposable syringe. The specimen was preserved in this way until time for examination, which was within 5 hours of collection. The urine sample were then examine macroscopically, biochemically and microscopically.

Macroscopic Examination

Urine samples were examined macroscopically for visible haematuria or cloudy appearance or both.

Biochemical Examination

Urine sample were examined biochemically immediately after collection using bio-scan test (Yeondong Pharm. Corp. Seoul, Korea) reagent strips to test for the presence of protein and blood.(Mott,*et al*,1985)

This was done by dipping the reagent strip into the urine sample and comparing the colour change with colour chart calibrated according to concentration showing a range of values from negative (less than 10 erythrocyte/ul urine) to increasing grades of positive (10,25,50,250 erythrocytes/ul of urine) for haematuria. The presence of protein in urine was also determined following the procedures. The calibration for protein in urine ranges from negative (less than 10mg/dl of

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urine to increasing values of 10,30,100,300,1000mg/dl of urine).

Microscopic Examination

The content of the preserved urine specimen were poured into a filtration system holding a Whatman No 1 filter paper previously punched out into circle, 47 mm in diameter. The bottles were rinsed twice with distilled water in the filtration system. It was allowed to stand on the bench for 24hrs to completely filter. (Mott, *et al*, 1983) To facilitate counting of ova the surface of the filter paper was marked off into 5mm prior to filtration. The two lines dividing the filter paper into quadrants were drawn lightly with pencil on the reverse side of the filter paper. Ova were counted using the binocular light microscope. The filter circle containing the ova was placed in a petri dish slide during examination. The whole surface of the filter paper was lightly moistened with distilled water from a wash bottle. A quadrant of the slide was first examined for ova, which was tallied using a hand tally counter. If 20 or fewer ova were found, the remaining quadrant was examined. If 21-150 were found, a second quadrant was examined and total multiplied by two. If more than 150 ova were found, the number of ova was multiplied by four (Ejezie and Ade-Serrano, 1980).

RESULT

The prevalence of *Schistosoma haematobium* among 200 subjects in Akpet Central was 85(42.5%). (Table I). Intensity of infection as measured by egg output shows that 63(74.1%) excreted between 1-49 ova/10ml urine (light) while less 22(25.9%) excreted >50ova/10mls urine.

Distribution of morbidity indicator by sex of subject is shown on table 2. Infection was more among male 52(47.4%)than female 33 (36.3%). However the difference in the prevalence by sex was not statistically significant (X=6.635 df, P > 0.01).

The mean egg output, haematuria and proteinuria is 42.3ova/10ml urine, 83.9ery/ul and 42.5mg/dl respectively. The frequency of haematuria by age of subject examined.is shown in Table 3. A total of 53(26.5%) had haematuria between 10-100ery/ul.

Age specific distribution of proteinuria among subjects studied showed that 62(31.00) had proteinuria of between 10-100mg/dl while only 12(6.00) showed proteinuria of greater than 100mg/dl.(Table 4)

DISCUSSION

Out of 200 subjects examined, 85(42.5%) were infected with *S. haematobium* in this hitherto undiscovered endemic focus.

The prevalence reported in this study for Akpet Central is similar to those reported for adjoining community of Adim and Ijiman. Ejezie *et al*, (1991) in a preliminary study of Adim for schistosomiasis reported a prevalence of 43.5% for school pupils examined at Adim A prevalence rate of 44.0% was reported by Ekanem, *et al*, (1994) for Ijiman. At Sankwala Akeh, (2003) reported a prevalence of 37.90% for urinary schistosomiasis. The result was equally found to be similar to 42.0% reported in northern Nigeria by Pugh *et al*, (1979). Ejezie and Ade-Serrano (1981) however recorded lower prevalence of 24% western Nigeria

Many factors may be responsible for this high prevalence rate of infection. The communal "open toilet" system enhances contamination of the rivers and streams with human waste. The lack of pipe-borne water encourages regular contact of human with these rivers and streams for recreational and domestic purposes. Though ecological study of the snail vector was not concurrently undertaken, it is strongly suspected that the rivers and streams around the community are the main source of infection.

Swamp rice farming which is the main occupation of the community has also been associated with urinary schistosomiasis (Ejezie, Gemade and Utsalo, 1989). Since children accompany their parents to the farms and stream, they are repeatedly exposed to cercarial infected water bodies.

Infection peaked in pupils aged 11-15 years. This agrees with other studies (Wilkins, 1979, Pugh *et al*, 1979, Ejezie and Ade-Serrano, 1981). However in the present study, age specific analysis shows that between the ages of 6-10years, infection rate was higher in males. This may because from 6-10years boys are comparatively less confined and therefore more involved with water for recreational activities. From the age of 13 years, water contact becomes less for recreation and more for domestic purposes for which females are more engaged than males.

The intensity of infection was low, (74.1%) of pupils had light infection (1-49ova/10ml urine) while only (25.9%) had heavy infection (>50 ova/10ml urine).

The pattern of haematuria and proteinuria were equally low. This pattern is in line with studies carried out in other parts of Cross River State (Ejezie, *et al*, 1991, Ekanem, *et al*, 1994 and Akeh, 2003). However in other endemic foci in Nigeria, morbidity is high, Ejezie and Ade-Serrano (1981) in Epe, Badagry and Edungbola *et al*, (1980) in Babana district of Kwara state.

The low egg output reported in Akpet Central is responsible for the low Morbidity. Perhaps acquired immunity due to constant exposure may Differences in prevalence among sexes were not statistically significant (P > 0.01). the higher prevalence in males may be due to the fact that they were more exposed to infected water bodies. However intensity of infection as measured by egg count, haematuria and proteinuria showed that females recorded more morbidity. This may be an indication that females were repeatedly in contact with water this is particularly important since the worm (schsitosoma) does not multiply in infected individuals (Muller, 1975).

The demand for local fish and agricultural products that involve water contact are in no doubt on the increase. Hence man-water activities to meet some of these needs will continue to increase.

The enlightenment of members of the community on the mode of transmission, prevention and control of schistosomiasis will help to reduce the prevalence of disease. Providing safe water supplies such as pipe borne, bore hold and well water, construction of footbridges across infected streams and rivers and safe recreation swimming sites will help reduce the prevalence.

Mass, selective or targeted chemotherapy should be encouraged and should be embarked upon because it yields quick results. The combined effort of both the community and government would help to improve the health condition of the people in this community and would directly or indirectly help fulfill the dreams of the World health organization to achieve health for all.

Table 1: prevalence of *Schistosoma haematobium* among 200 pupils studied.

Age (yr)	No. Examined	No. Infected	Intensity of infection egg output/10ml urine Light (1-49)	Heavy (>50)
5-7	43	12(28.91)	12(100.00)	-
8-10	70	20(28.50)	16(80.00)	4(20.00)
11-13	80	50(62.50)	33(66.00)	17(34.00)
14-16	7	3 (42.90)	2 (66.70)	1(33.30)
Total	200	85(42.50)	63(74.10)	22(25.90)

Table 2: Distribution of morbidity indicators by sex of subjects

Sex	No. Examined	No. Infected	Mean egg output/10ml urine	Mean haematuria ery/ul	Mean proteinuria Mg/dl
Male	109	52(47.7)	37.50	96.06	41.52
Female	91	33(36.3)	47.09	83.90	42.30
Total	200	85(42.50)	42.29	89.29	41.76

Table 3: Age specific prevalence of haematuria and ova in subject studied

Age (yr)	No. Examined	No. Infected	Prevalence of haematuria (%) 10-100ery/ul	101-250ery/ul
5-7	43	12(28.91)	12(27.90)	-
8-10	70	20(28.50)	10(14.10)	5(7.14)
11-13	80	50(62.50)	30(37.50)	11(31.80)
14-16	7	3(42.90)	1(14.30)	2(28.60)
Total	200	85(42.50)	53(62.35)	18(21.18)

Table 4: Age specific distribution of proteinuria and ova in subjects studied

Age (yr)	No. Examined	No. Infected	Prevalence of proteinuria 10-100mg/dl	101mg/dland above
5-7	43	12(28.91)	12(27.90)	-
8-10	70	20(28.50)	13(81.60)	4(5.70)
11-13	80	50(62.50)	35(43.80)	7(8.75)
14-16	7	3(42.90)	2(28.60)	1(14.30)
Total	200	85(42.50)	62(72.94)	12(14.12)

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