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Studies of the Severity of Urinary Schistosomiasis in Relation to Age and Sex in Borno State , Nigeria

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ABSTRACT: The severity of urinary schistosomiasis infection among school children in relation to age and sex was investigated in Borno State. The highest percentage (32.84%) of the males with light infection belonged to the age group 6-7 years, highest percentage (39.34%) of males with moderate infection belonged to the age group 8-9 years while the highest percentage (34.83%) of males that had heavy infection belonged to the age group 12-13 years. For the females, the highest for both light infection (37.29%) and moderate infection (38.18%) belonged to the same age group of 8-9 years while that for heavy infection (29.41%) was in the age group of 12-13 years. There was a significant ($P \leq 0.05$) difference in the higher percentage of heavy infection of the males (24.38%) than females (9.32%). Urinary schistosomiasis therefore shows a progressive picture from light infection to heavy infection if not treated and should be treated urgently to avoid serious pathological consequences.

Key Words: Urinary schistosomiasis; Sex differences; Borno State; Nigeria.

Introduction

Most of the developing countries in the tropics, especially in the African continent, are afflicted with all the eight target diseases mentioned by the UNDP/World Bank/WHO special programme for Tropical Diseases Research (TDR) of which schistosomiasis is among (Vogel, 1992). Schistosomiasis is a disease of public health importance affecting mostly the rural communities who are mostly farmers that use their water bodies for irrigation and fishing. Agriculture makes up the greater percentage of the mainstay of the economy of most tropical countries and for the farmers and their children to be debilitated by the scourge of schistosomiasis means a reduction in their productivity and consequently the countries Gross Domestic Product (the recent contribution by oil resources in some countries, notwithstanding).

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The serious pathological damage to victims takes a long but progressive period and the schistosome egg is both the prime inducer of pathology in the host and the means of the parasites dispersal (Wright 1967, Smyth, 1976, Basch 1981). An untreated patient degenerates from light infection to moderate infection to heavy infection stages inducing such pathological effects as pseudo-tubercle formation, fibrosis and calcification leading to ureteric obstruction (Ukoli 1984). Results of some prevalence studies on schistosomiasis in Nigeria revealed that urinary schistosomiasis caused by *Schistosoma haematobium* has a higher prevalence rate than intestinal schistosomiasis caused by *Schistosoma mansoni* (Ukoli 1984, Oyerinde *et al* 1990).

Some earlier authors (Farooq *et al* 1966, Abdullahi 1983, Amali 1993) reported mostly sex prevalence differentials but not actually indicating the severity levels of the disease in relation to sex and age. There is more evidence of higher prevalence in males (Forsyth & Macdonald 1966, Tayo *et al* 1980, Okwuosa & Banke 1990) than in females (Anyia & Okafor 1987, Uko *et al* , 1990; Ezeugwu & Obiamiwe 2003). The present study focused on the severity of urinary schistosomiasis in relation to sex and age among school children in Borno State .

Materials and Methods

Study Area

The study was carried out between 1992 -1995 in Borno State which is located in the North-East geographical zone of Nigeria with Maiduguri as the State capital. Climatically, the area is characterized by the arid and semi-arid ecological features with prolonged dry season of between 5-8 months with about 55% of the state afflicted with desertification (Ezeugwu & Mafe 1998).

Survey of school children

Children of primary school age (6-above 14 years) were examined for infection in five primary schools located in Central and Northern Borno . Demographic data were gathered using questionnaire. Of all the demographic information gathered, special attention was paid to age, sex and water contact behaviours. The urine samples of six hundred and fifty three males and five hundred and twenty six females were collected and examined using the method of sedimentation and centrifugation (Smyth 1976). Depending on the number of egg counts per 10ml urine, each of the 365 infected pupils (male and females) were classified into one of the following three severity levels: light infection (<50 eggs/10ml urine), moderate infection (50-300 eggs/10ml urine) and heavy infection(>300 eggs/10ml urine) according to Anya & Okafor 1987. The differences in the percentage distribution in severity levels were statistically tested for significance by the use of the chi-sq kit at 95% confidence interval.

Results

For the males, age groups of 6-7, 8-9 and 12 -13 years had the highest percentages of light infection (32.84%), moderate infection (39.34%) and heavy infection (34.83%) respectively as shown in Table 1. The table revealed that there were significant ($P>0.05$) differences in the severity levels within and among the age groups. For the females, the highest for both light infection (37.29%) and moderate infection (38.18%) belonged to the same age group of 8-9 years while that for heavy infection (29.41%) was in the age group of 12-13 years.

The analysis of the disease severity level among all the infected people as it relates to sex is shown in Table 2. There was a significant ($P>0.05$) difference in the higher percentage of heavy infection in the males (24.38%) than the females (9.32%). The table also revealed that the distributions of light infection and moderate infection among the sexes were not significant ($P>0.05$).

Table 1: Distribution of severity status of *S. haematobium* infection in relation to age in Borno State.

Age Group (Years)	Males			Females		
	Light infection (+)	Moderate infection (++)	Heavy infection (+++)	Light infection (+)	Moderate infection (++)	Heavy infection (+++)
6 – 7	22 (32.84)	4 (6.56)	11 (12.36)	6 (10.17)	8 (14.55)	5 (14.71)
8 – 9	10 (14.93)	24 (39.34)	15 (16.85)	22 (37.29)	21 (38.18)	4 (11.76)
10 – 11	13 (19.40)	6 (9.84)	13 (14.61)	17 (28.81)	11 (20.00)	9 (26.47)
12 – 13	13 (19.40)	22 (36.07)	31 (34.83)	11 (18.64)	13 (21.82)	10 (29.41)
14 & Above	9 (13.43)	5 (8.19)	19 (21.35)	3 (5.09)	3 (5.45)	6 (17.65)
Grand Total	67 (100.00)	61 (100.00)	89 (100.00)	59 (100.00)	55 (100.00)	34 (100.00)

Figures represent the numbers infected with percentage infection in parentheses.

(+) Light infection (< 50 eggs/10 ml urine); (++) Moderate infection (50 – 300 eggs/10 ml urine); (+++) Heavy infection (> 300 eggs/10 ml urine)

Table 2: Severity levels of *S. haematobium* infection in relation to sex in Borno State.

Severity Level	Males		Females	
	No.	%	No.	%
Light infection (+)	67	18.36	59	16.16
Moderate infection (++)	61	16.71	55	15.07
Heavy Infection (+++)	89	24.38	34	9.32
Grand Total	217	59.45	148	40.55

(+) Light infection (< 50 eggs/10 ml urine); (++) Moderate infection (50 – 300 eggs/10 ml urine); (+++) Heavy infection (> 300 eggs/10 ml urine)

Discussion

The result revealed that the severity levels of light to heavy infections were distributed among all the age groups. However, the age group 12-13 years recorded the highest percentage of heavy infection. This is probably related to the fact that the pupils in this age group have the highest freedom and more contact with the infected water coupled with the fact that majority of them do not complain to their parents so as to be taken to hospital for treatment thereby allowing the infection to advance from light to moderate to heavy intensities. This also explains why the highest percentages of light infection was recorded among the younger age groups 6-7 (32.84% in males) and 8-9 (37.29% in females) implying that in situations of no treatment (which is mostly the case), by the time these younger pupils (6-9 years) enter into the 12-14 years and above age bracket, the disease might have advanced into heavy infection state of the severity levels.

This low to moderate infection in younger pupils is similar to the result of Thomson (1967), Pugh *et al* (1980) who worked in other parts of Northern Nigeria . They noted that although the low severity of infection in the Savanna regions of Nigeria are obscure, they are probably linked with the highly seasonal nature of the transmission sites (surface waters) and patterns of water contact by human population. The revelation from this study of the progressive nature of schistosomiasis from light infection in younger children to heavy infection in older pupils is further corroborated by Wilcocks & Manson-Bahr 1972, Smyth 1976, Dresden & Payne 1981, Leedom & Short 1981, Ukoli 1984 and Wilkins 1985 who, working independently, reported on the progressive nature of the clinical symptoms and serious pathological effects of schistosomiasis attributing the major factor to the schistosome eggs.

Conclusion

The pupils in the age grade 12-13 years exhibit a higher level of water contact frequency and consequently form a target group in the control of schistosomiasis as they constantly pollute the water with their urine containing the schistosome eggs. The progressive nature of the disease from the light to moderate to heavy severity levels is revealed and early treatment of the disease is of immense importance to avoid the aggravation of the disease to heavy infection stage.

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