Effect of Nutrition on Schistosomiasis Infection among Primary School Pupils of *Ebute-Igbooro, Yewa* North Local Government

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ABSTRACT

Schistosomiasis is a parasitic disease caused by flukes (trematodes) of the genus *Schistosoma*. A survey of the effect of nutrition status on *Schistosomiasis* among Primary school pupils of St. John's primary school and Local Authority primary school, *Ebute-igbooro, Yewa* North Local government was carried out. The study group was made up of pupils of St John's Anglican Primary school and *Yewa* North Local Authority Primary school both in the village. The research was designed as a cohort study to include a baseline examination before treatment and follow up examination 6 and 12 weeks post treatment. Baseline examination included 378 school children with age range 5-12 years in Primary schools. The urine samples were collected and further subjected to microscopic examination to check for the presence of *S. heamatobium.* Height, weight, mid-upper arm circumference were measured and questionnaires were administered to obtain demographic data from pupils. The result indicated that infected children have poor Body mass index (BMI) that showed underweight and poor nutrition status.

Keywords: Schistosomiasis, Trematodes, Demographic, Body mass index (BMI), *Schistosoma heamatobium*

1.0 INTRODUCTION

Human *Schistosomiasis*, otherwise known as *Bilharzia*, is a fresh water snail transmitted intravascular debilitating disease resulting from infection by the parasitic dimorphic *Schistosoma* trematode worms, which lives in the bloodstreams of humans (Steinmann et al., 2006). *Schistosomiasis* is a parasitic disease caused by flukes (trematodes) of the genus *Schistosoma*. Human get infected with this disease when they make contact with cercariae –contaminated water. Prevalence of *Schistosomiasis*, at present, is still high in sub-Saharan Africa. In 2008, 17.5million people were treated globally for *Schistosomiasis* 11.7million of those from sub-Saharan Africa (WHO, 2014). Approximately 120million individuals in sub-Saharan Africa have *Schistosomiasis*-related symptoms while about 20million undergo hardship as a result of chronic presentation of disease (Chitsulo et al., 2000).

Nutrition plays a major role in child physical and cognitive development. The early nutrition has a lot in preparing a child against future illnesss. *Schistosomiasis* infection has a great impact in suppressing child nutrition whether as direct effects or as a result of hemorrhage that the infection causes which leads to the loss of mineral elements in the body. The situation becomes worse especially in *Schistosomiasis* endemic area when the average food intake is even lower than the acceptable standard that makes the child develop immunity against arrays of infections.

The knowledge about the *Schistosomiasis* in the affected area is poor, this is unconnected with inability of the community to have access to standard clinic and other health infrastructure that may aid the eradication of the disease. The source of water both for domestic activities and farming is still the Yewa River; therefore a study of this type will create awareness and can also help in policy formulation in the control of the disease in the community. The study aimed to investigate the morbidity pattern in general and effects of nutrition on the prevalence of the disease in the community.

2.0 MATERIALS AND METHODS

2.1 STUDY AREA

The study was conducted in Ebute-igbooro, in Yewa North local government area of Ogun state. Yewa River is a popular river that flows round, serve the purposes of domestic and agricultural activities in the village. The village has two basic schools for the children that live in that community, namely St. John primary school and Local authority primary school.

2.2 METHODOLOGY

2.2.1 Parasitological Examination:

Capped urine bottles were labelled, numbered and distributed to the school children. Instruction was given to the children on urine collection. Urine samples were collected from the students and subjected to parasitological examination.

Using the rapid diagnosis test strip (URO-DIP 10 and DUS 10), which was dipped into each urine samples after thoroughly shaken for even distribution of the eggs or particles in the urine. The presence of the microbe and level of presence of the infection was indicated by a colour change. The colour change was read against the readings on the hematocrit container being indicated by the manufacturer.

2.2.2 Microscopic Examination

Urine samples were spinned in the centrifuge for five (5) minutes at 5000rpm; the sediment is then poured onto a sterile, clean microscope slide and placed under the microscope. A cylindrical shaped structure with two endings shown in an infected urine indicate the presence of *S . haematobium*. The number of *S. haematobium* was counted and recorded.

2.2.3 Anthropometric Evaluation

The anthropometric measurements were carried out according to (Wiener and Lourie, 1969). Weight was measured with scales with 100kg capacities. All children were weighed and weight was recorded. For measurement of height, a tape rule was used to measure their heights. Mid-upper arm circumference was taken with a non-expandable tape measure.

2.3 Data Collection

Questionnaires were given to each pupil and interviews were conducted on each pupil concerning questions relating to their environment, family, feeding habits, nutritional status, health issues and body changes.

3.0 RESULTS

Table 1: Respondents' social demographic characteristics

Variables	n= 378	%
Sex		
Male	224	59.3
Female	154	40.7
Age groups (years)		
≤ 3 years	15	4
4-7 years	114	30.2
8-11 years	193	51.1
12-15 years	54	14.3
≥ 16 years	2	0.5
Weight (kg)		
≤ 10	5	1.3
11-15	184	48.7
16-20	158	41.8
21-25	26	6.9
≥ 26	9	1.3
Height (m)		
≤ 1m	27	7.1
1.01-1.09	17	4.5
1.1-1.5	317	83.9
1.6-2.0	12	0.5
2.10-2.09	2	0.3
2.1-2.5	1	0.3
≥ 2.6m	2	0.5

Table 2: Sources of drinking water by the respondents and the infection status

Sources	**Infectious**		**Test**
Well water	Negative	Positive	
F	232 (84.1%)	82 (80.4%)	*x*2= 2.826
T	40 (14.5%)	20 (19.6%)	p=0.243
Spring water			
T	86 (31.2%)	31 (30.4%)	*x*2= 1.546
F	186 (67.4%)	71 (69.6%)	p=0.462
Stream			
T	117 (42.4%)	49 (48.0%)	*x*2= 2.258
F	155 (56.2%)	53 (52.0%)	p=0.323
River			
T	125 (45.3%)	71 (69.6%)	*x*2 =18.243
F	147 (53.3%)	31 (30.4%)	p=0.000
Rain			
T	145 (52.9%)	65 (63.7%)	*x*2= 8.097
F	126 (45.7%)	36 (35.3%)	p=0.088

T=True, F=false.

Whereas there is significant association of river water with infection status, others have no association with infection status

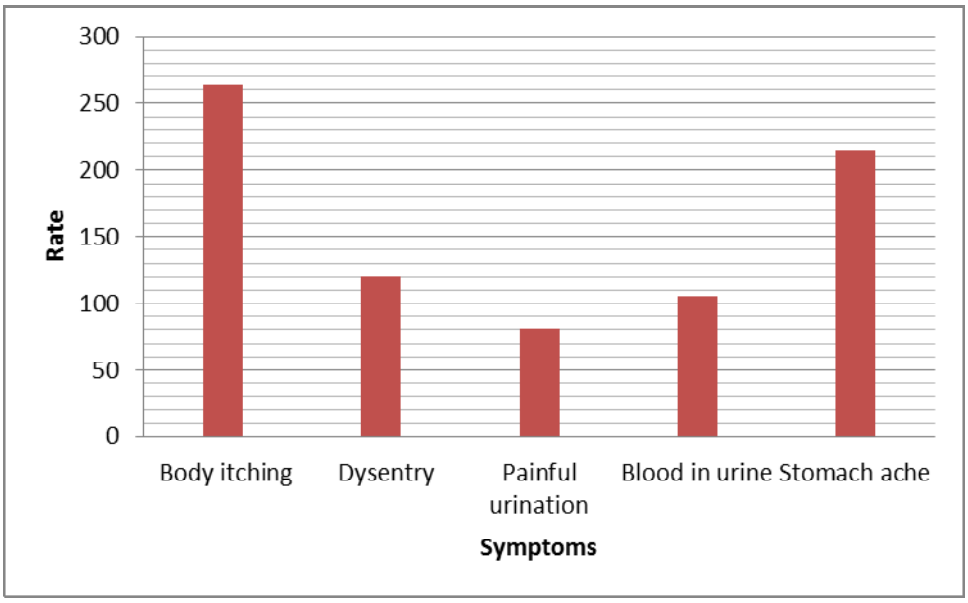

Fig 1: Symptoms of schistosome as reported by respondents.

Table 3: Body Mass Index (BMI) of the respondents and their infection status (n=365).

BMI	Positive	Negative	Total	Test of Significant
≤18	65 (26%)	185 (74.0%)	250	$x2 = 1.975$
18.5-24.9	31 (32.6%)	64 (68.4%)	95	p> 0.05
25-29.9	7 (35%)	13 (65%)	20	

4.0 DISCUSSION

Nutritional evaluation of individuals is a complex process. The world health organisation has favoured the use of the anthropometric indices of weight-for-age (WFA), height-for-age (HFA) and weight-for-height (WFH) that are simple to obtain and accurate for the purpose of most studies (WHO, 1995).

An epidermiological survey suggests that the first indication of a nutritional defect and/or infection is weight loss (wasting) followed by retardation in linear growth (Walker et al., 1996). Some common causes are inadequate dietary intake, disease, inadequate health services, unhealthy environment, inadequate household food security and inadequate mother and children caring practices (Smith et al., 2000). In this result, the demographic variables of pupils data were used to evaluate the causes or factors which could be responsible for the low nutritional status of pupils and increase risk of infections in them; children within the age 0-3years were 15 (3.9%), 4-7years were 114 (29.9%), 8-11years were 193 (50.7%), 12-15years were 54 (14.2%) while 16-19years were 2 (5%). In this study,

children infected with schistosomiasis were more malnourished than the children without the infection; this was also inline with the work of Zeleke et al (2014) Out of the 378 pupils examined in this study and based on the data obtained from them, percentage of those who wear shoes are 81.6% while those who don't are 16.5% and others are 7%; pupils who sleep under treated bed net are 61.2%, those who don't 1.6%; pupils living in earth house are 42.3%, those who don't are 55.9%, those who have electricity are 74.5%, those without electricity 23.6%; mid upper arm circumference less than 15(<15) are 28.3%, those within the range of 16-18cm are 59.1% and those within range 19-21cm are 11.0%.

From the result, it could be denoted that pupils eat more of carbohydrate or starchy food than they take proteineous food, perhaps some eat these food but not in the adequate proportion which led to a decrease in their blood protein level and increasing the infection status.

Under-nutrition continues to be a major health burden in the developing countries. Since parasitic infections cause anorexia and poor absorption of nutrients and promote the deviation of nutrients to the organism's defence mechanisms, they contribute to the onset or exacerbation of weight and height deficits (Jardim- Botelho et al., 2008).

CONCLUSION

The study concluded that there is a significant effect of nutrition and nutritional status of pupils or individuals on the level of infection. A good nutrition contribute to individuals defence mechanism against infection and a deviation of nutrients to the individuals defence mechanism, contribute to an increase in level of infection and causing a decrease in weight and height of children leading to stunting and wasting.

RECOMMENDATION

In order to increase the feeding habit of parent and children, and level of good living in *Ebute-igbooro*, government as well as non–governmental organisations (NGO), should help provide food and portable water with other basic amenities.

A community health campaign and adequate health education should be carried out to make individuals ssee reasons why they need to eat good food, and most of the good foods used on commercial purposes should also be consumed by them to improve their health status. They should eat more of protein but less of carbohydrate.

Since this is a predominantly childhood infection, children should be educated on the mode of transmission of the disease and the pathology of the disease and therefore encourage them to adopt control measures.

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