

## PREVALENCE OF INTESTINAL PARASITES AMONG SCHOOL CHILDREN IN MOYO DISTRICT, UGANDA

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### Abstract

*Faecal samples from 94 schoolchildren of five primary schools in Moyo subcounty, West Nile, were examined by concentration method. Forty pupils, 22 boys and 18 girls were found infested with one or a combination of intestinal parasites. Hookworm affected 12.8% of the children examined followed by Schistosomiasis (9.6%), and Ascaris spp. was the least infestation (4.3%). The factors that favoured parasitic infestation could include climate, poor sanitation, poverty and lack of awareness about the outcomes of parasitic infestation. Having identified the most common human parasites in schoolchildren, this study provides the public health personnel and school administrators in the district with the information needed to refocus their performance and integrate parasite screening and control in their school health activities. In addition, the results could be extrapolated to reflect the situation in other areas with similar eco-epidemiological dynamics, in order to enable the designing of critical control strategies with minimal budgetary inputs.*

### Introduction

Parasitic infestations constitute one of the commonest problems in the Ugandan population. They greatly affect the health and socio-economic status of individuals and communities. Through anaemia, they weaken the individuals and render them unable to do gainful activities. Anaemic individuals also succumb easily to other infections and infestations. In addition, anaemic individuals are more likely to respond slowly to treatment, to develop complications of disease and eventually to be poor. The parasites contribute to anaemia in pregnancy and lead to poor pregnancy outcomes for both mothers and child. For school children, anaemia reduces their cognitive ability and hence affects their academic performance (Okpala, 1956; Gbakima et al.; 1994). This study was done as an exploratory step, a rapid assessment of the prevalence of intestinal parasites in schoolchildren of Moyo District, with a view to plan for an intervention that could contribute to improving the health status of schoolchildren.

Moyo sub-county, where the study was done, borders with southern Sudan to the north and R. Nile to the west. There are many population movements, with people frequently crossing from Sudan to Uganda and back. Apart from the single government hospital

in Moyo town and a few lower level government health units, all of which lack adequate laboratory services, the residents depend on ill-equipped private drug shops, clinics, and drug peddlers for their health care provision. Moreover, there is low awareness by the population about the problem of parasitic infestations and how to control them. The latrine coverage is very low and the faecal disposal practices are not always appropriate for public hygiene and sanitation. The majority of the residents engage in activities that bring them into direct contact with intestinal parasites. They depend on subsistence agriculture, digging with hoes, working with bare hands and walking barefooted in the gardens. Most of the schoolchildren have no shoes for school and walk through village paths barefooted. Due to the proximity of some rivers, especially the R. Nile, many people - especially school-age boys, engage in activities like fishing and swimming, which predispose them to contact with other intestinal parasites like cercariae of schistosomes. The area has a modified equatorial climate, with three peaks of rainfall per year and high temperatures averaging 28o C, all of which favour the hatching of geo-helminth ova and the multiplication of cercariae, ensuring a perennial presence of the infective stages of a number of intestinal parasites.

### Methodology

The study was done in the five primary schools (Orokomba, Mada, Etele, Illi Valley and Torolo) of Moyo Sub-county in Moyo District of Northern Uganda, from which we randomly selected 20 children per school. The 100 schoolchildren (50 boys and 50 girls) were aged between 6 and 14 years. They were all given a registration number on a card, which they enclosed with their stool samples in disposable polythene bags supplied to them. The fresh faecal samples were immediately transported to the central laboratory in Moyo Hospital, the district referral hospital, and analysed using the concentration technique outlined by Fripp (1995).

### Results

Ninety-four fecal samples were committed for examination as shown below:

#### Samples examined per school

School	Number examined by sex		Total
	Male	Female	
Orokomba	10	10	20
Mada	8	9	17
Etele	11	8	19
Illi Valley	12	7	19
Torolo	10	9	19
Total	51	43	94

Of these, 40 (42.6%) samples from 22 boys and 18 girls were found infested with at least one or a combination of up to three types of helminths and three types of protozoa parasites. Hookworm, *Strongyloides* spp., was the most prevalent infestation and was found in all the five schools with 12 (28%) of the infested cases. The roundworm, *Ascaris* spp., had the least infestation levels, affecting 4 (9%) of the infested children. Cases of ascariasis were not recorded in Illi Valley and Torolo primary schools. Among the protozoa, *G. lamblia*, ranked highest (19%) and it was recorded in all the schools, as shown in the table below:

#### Prevalence per parasite among those examined

Parasite	Cases	Percent
<i>Strongyloides</i> spp.	12	12.8
<i>Schistosoma mansoni</i>	9	9.6
<i>Giardia lamblia</i>	8	8.5
<i>Entamoeba histolytica</i>	7	7.4
<i>Ascaris</i> spp.	4	4.3
Not infested	54	57.4
<b>Total</b>	<b>94</b>	<b>100</b>

Of the samples submitted per school, Mada had the highest percentage infestation levels (52.9%) and Torolo the least with 31.6%. Overall, there was an average infestation level of 42.6% in the schools of Moyo sub-county as shown below.

#### Parasitic infestation per school

School	Number examined		Total Examined	Total infested (%)
	M	F		
Mada	8	9	17	9 (52.9)
Etele	11	8	19	9 (47.4)
Illi Valley	12	7	19	9 (47.4)
Orokomba	10	10	20	7 (35.0)
Torolo	10	9	19	6 (31.6)
<b>Total</b>	<b>51</b>	<b>43</b>	<b>94</b>	<b>40 (42.6)</b>

### Discussion

The overall average parasitic infestation rate in schools of Moyo District could be very high. Given that the 20 children examined per school were randomly selected, an overall average infestation rate of 42.6% in the sample is exceptionally high, despite the fact that 20 is not a representative sample size. Such factors mentioned above that characterize the region are ideal for parasitic prevalence. Ascariasis, and the hookworm diseases are geo-mediated infestations whose endemicity is facilitated by number of factors, such as climatic factors, including high temperatures, and heavy precipitation. These two factors account for high humidity, the single most important parameter that favours the hatchability of geo-helminth ova in the soil (Smyth, 1994).

The prevalence of the protozoa parasites among the children is seemingly low. This could be explained by the method used to process faecal materials. The majority of the identifiable motile trophozoites could have been destroyed during concentration of the stool samples. The method of direct examination of wet stool would have probably revealed more *E. histolytica* and *G. lamblia* (Fripp, 1995).

For *S. mansoni* boys are more affected compared to girls and this could be attributed to swimming in the rivers, a common behavioural risk factor in boys at this age, where they would interact with the infective cercariae. Elsewhere, such activities and situations like swimming, fishing, watering of animals, swamp/wetland rice growing, have been identified as critical in schistosomiasis epidemiology (Highton, 1974; Aronola and Fawole, 1995).

The hookworm infection rate of 28 per cent is indicative of lack of footwear amongst the pupils. Indeed, the people are poor and children walk bare-footed through the bush paths from their villages to schools. It is also indicative of the unsanitary fecal disposal methods of the population. The high rate of ingested parasites such as *E. histolytica*, *G. lamblia* and roundworm is a direct result of the unsanitary conditions around the homes of the people since sanitary facilities at the schools were adequate and well used. Sanitary facilities in the homes are inadequate to the majority of the people, particularly in Aluru parish through which Ebihwa River runs, and where latrines are scarce. Similar observations were made by Jacobson, (1974), Arinola and Fawole, 1995) in Tanzania and Nigerian villages, respectively.

Kabatereine et al.; (1997) recorded other human intestinal parasites in primary schools of Kampala city, including *Trichuris trichiura*, *Strongyloides stercoralis*, *Taenia* sp. and *Enterobius vermicularis*. These have not been identified in the present study. This could be explained by the fact that Kampala, as a capital city, receives people from various areas, both nationally and internationally searching for different opportunities unlike Moyo, which is relatively localised. Periodic migration of people from Nyanza region of western Kenya to Kampala had earlier been identified as the most important epidemiological factor for persistence of hookworm infestation in Kampala (Kakande, 1971). Also, periodical movement of pupils during school holidays to their western Kenya upcountry homes from Nairobi city were shown to lead to their re-infestation with hookworm and *T. trichiura* (Wijers et al.; 1972).

There is no distinct reason to account for the differences in parasitic distribution in the different schools, because both environmental and socio-economic and cultural conditions appear similar. Moreover, there is no significant difference in parasitic prevalence in the different schools (chi square = 2.51 at  $p = 0.05$  and 4 df).

Although other studies have shown a functional relationship between sex and parasite infestation (Wijers et al.; 1972; Arinola and Fawole, 1995; Albonico et al.; 1997; Kabatereine et al. 1997), sex has not been found significant in this study, (chi square = 0.016 at  $p = 0.05$  and 1 df).

### **Conclusion and recommendation**

Socio-economics, topography and climatic factors, like elsewhere, seem to promote the helminthic prevalence than any other factors, in this part of Uganda. In view of their role in causing anaemia and retarding academic

performance, comprehensive investigations of intestinal parasites of in the schools of the entire West Nile region need to be carried out.

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