PARASITIC INFECTIONS IN HUMAN COMMUNITIES LIVING ON THE FRINGES OF THE CROCKER RANGE PARK SABAH, MALAYSIA.

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ABSTRACT

Most of the parasites that occurred during this survey are Giardia lamblia, Ascaris *sp, hookworms and* Trichuris trichiura. *One hundred and fifty stool samples were collected from seven villages. Samples were diagnosed by direct preparation and formol ether concentration technique. The prevalence rate for intestinal protozoan were* Entamoeba histolytica *21.0%,* Giardia .lamblia *8.6% and* Entamoeba coli *only 3.3%. The prevalence rate for soil-transmitted helminths were* Trichuris trichiura *10.0%,* Ascaris lumbricoides *8.7% and hookworm 3.3%. The age group 11-20 years old had the highest rate of infection with both helminths and protozoa.*

INTRODUCTION

The prevalence of parasitic infection varies with the level of sanitation and is generally higher in the tropics and subtropics than in temperate climates. Lumen-dwelling protozoa and worms are common in areas where both crowding and poor sanitary facilities occur. The list of lumen-dwelling protozoa and worms that are prevalent among rural communities in Malaysia include *Entamoeba histolytica, Entamoeha coli, Giardia lamblia, Ascaris lumbricoides* (roundworm), *Trichuris trichiura* (whipworm) and hookworm. In some tropical areas, infection rate may be as high as 50-80% in rural areas and among lower socioeconomic group. The severity of the disease and the incidence of complications may likewise be greater in the rural tropics. These parasites infect hosts of all ages but the prevalence and intensity of infection are highest among school-aged children. In developing countries, girls between 5 and 14 years old have 12.3% of the total disease burden compared to boys with 11.4% (Watkins, et al. 1996). From an epidemiologic standpoint, it is important to differentiate among the acute, chronic and asymptomatic stages of infection.

The Crocker Range Park (CRP) is a tropical highland and mountainous area in the interior regions of Sabah. This area is divided into three subdivisions by two trunk roads; namely the Kimanis-Keningau and the Kota Kinabalu-Tambunan roads that cut across the range. For generations the undulating rural areas located on the periphery of this newly-established CRP have become the home of the indigenous peoples of the Kadazandusuns and the Muruts. Most of them are farmers whose main activities include cultivating wet paddy, hill paddy, bananas and corns. Generally all the villages are provided with clean piped water supply and educational facilities up to at least the primary level. Only two of the villages visited, namely Patau and Tikolod have been provided with electricity. Modern medical care is made available to the communities through the services of a medical unit from Tambunan District Hospital.

A study was conducted to determine the infection of these lumen-dwelling parasites among the schoolchildren and the older communities living in the vicinities of the Crocker Range Park Sabah.

MATERIALS AND METHODS

Study Area

For each district, two villages were selected from the many settlements found scattered along the north to south boundaries of CRP. For Tambunan district, the study sites were Kampung Tikolod and Kampung Sunsurun which combined consist of about sixty to eighty houses with a total population of about 200 people. For the Keningau district, Kampung Bandukan and Kampung Bingkor with a total population of less than 100 people were selected while for Tenom district, Kampung Ulu Senagang and Kampung Pulong with the biggest population of 350 and consisting of primarily the Murut ethnic group.

Sampling

Containers for stool samples were distributed to registered individuals who present themselves at the community hall. Brief instructions on how to collect the stool were given and they were advised to fill the size of the tip of the thumb (approximately 10g of stool) using a plastic spoon attached to the cover of the container. The stool samples were collected on the next day from the village headmen's (Penghulu) houses. Samples were brought back to the base camp and examined by light microscopy for the presence of intestinal protozoa parasites and helminth eggs (Walters et al. 1995).

RESULTS AND DISCUSSIONS

A total of 150 stool samples from 73 males and 77 females were examined. The prevalence of intestinal parasites is shown in Table 1. The protozoan parasites identified and their prevalence in the sample populations were *Entamoeba histolytica* (21.0%), *Giardia lamblia* (8.6%) and *Entamoeba coli* (3.3%). There was no significant difference in the prevalence rate of infection between sexes. Age group analysis showed that for protozoan infections, the age group 11-20 years old gave a slightly higher percentage compared to the age group 1-10 years old.

For soil-transmitted helminthes, the prevalence of infection is shown in Table 2. The infection of *Trichuris trichiura* (10.0%) was the highest percentage compared to *Ascaris* (8.7%) and hookworm (3.3%). The prevalence for single infection was 12.6%, double infection was 4.6% and triple infection was 2.0%. The highest rate of infection was the age group of 11-20 years old (Table 3).

Table 1. Prevalence of intestinal parasites by sex and age

	Sex			**Age**			
Protozoa	Male	Female	Total	1 -10	11-20	21-30	31&above
No. samples	73	77	150	42	48	38	22

E. histolytica	5 (6.8%)	9 (11.7%)	14 (21.0%)	5 (11.9%)	8 (16.7%)	5 (13.2%)	3 (13.6%)
G. lamblia	7 (9.6%)	6 (7.8%)	13 (8.6%)	7 (16.7%)	5 (10.4%)	4 (10.5%)	5 (22.7%)
E. coli	3 (4.1%)	2 (2.6%)	5 (3.3%)	9 (21.4%)	8 (16.7%)	5 (13.2%)	7 (31.8%)

Table 2. Prevalence of intestinal helminths according to sex

		Ascaris		*Trichuris*		Hookworm		Total	
Sex		No.	%	No.	%	No.	%	No.	%
Male	73	8	10.9	7	9.6	3	4.1	18	1.2
Female	77	5	6.5	8	10.4	2	2.6	15	1.0
Total	150	13	8.7	15	10.0	5	3.3	33	22.0

Table 3 Prevalence of Ascaris, hookworm and Trichuris and multiple infections among different age groups

Age Group	Sample size	Ascaris		Hookworm		Trichuris		Single infection		Double infection		Triple infection	
		No	%	No	%	No	%	No	%	No	%	No	%
1-10	42	9	21.5	5	11.9	8	19.0	5	11.9	4	9.5	2	4.8
11-20	48	5	10.4	3	6.3	5	10.4	6	12.5	2	4.2	1	2.1
21-30	38	4	10.5	2	5.3	7	18.4	4	10.5	1	2.6	0	0
31 & above	22	3	13.6	0	0	4	18.2	4	18.2	0	0	0	0

Intestinal parasitic infections are common wherever the environment and poor sanitation allow their spread. The most common species found in this study are *Ascaris lumbricoides*, *Trichuris trchiura* and hookworm. They are found to infect a significant percentage of the individuals living in these communities, including some with multiple infections.

Our preliminary investigation indicates that improvements in sanitation and the availability of inexpensive anti-helminthic drugs to the communities in CRP have changed the parasitic profile of the people here for the better compared to other communities living in poor sanitary conditions in other rural parts of Malaysia (References). More public awareness programmes to promote a better understanding on the adverse impacts of worm infestation and other parasitic health problems among the children of these communities are deemed necessary. Such awareness will bring about positive changes and adaptation in both their social and cultural practices that can help in reducing the infection rate through proper use of water supply and practice of modern sanitation in their daily lives.

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