

PREVALENCE AND DISTRIBUTION OF INTESTINAL AND BLOOD PARASITES AMONG IBANS IN THE NANGA ATOI IN THE SECOND DIVISION IN SARAWAK.

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ABSTRACT

About two-thirds (67.6%) of 142 Ibans (from birth to 90 years of age) from 26 house-holds in a longhouse in Nanga Atoi in the Second Division of Sarawak were infected with intestinal parasites. The more common helminthic infections were hookworms (47.2%) and *Trichuris trichiura* (43.0%). Intestinal protozoan infections were less common. Single helminthic infections were more common than multiple infections and the commonest type of multiple infections was *Trichuris* mixed with hookworms. Malaria and filariasis were not reported among these inhabitants surveyed.

INTRODUCTION

The Ibans are the largest indigenous group in Sarawak where they live mostly in longhouses throughout the state. Little is known about the health status and the types of parasitic infections affecting this group of indigenous people, though much of their heritage and culture has been long-established and well-known.

The present survey was carried out on the Ibans living in longhouses in the Nanga Atoi area by a group of medical undergraduates involved in the Baktisiswa Sarawak 1987 Project. The purpose of the survey was to study the prevalence and distribution of intestinal parasitic infections, malaria and filariasis amongst the inhabitants in the longhouse in the study area.

STUDY AREA AND INHABITANTS

Nanga Atoi is a longhouse situated approximately 20km away from the town of Saratok in the Second Division of Sarawak. The longhouses can be reached from Saratok by a 20-minute van ride followed by a 20-minute trek through jungle paths.

The are 205 inhabitants living in 26 households within the longhouse. Extended families are present in several households. The average family size is 7.9 and the ages of the inhabitants ranged from 1 to 90 years. A considerable number of children of schoolgoing age reside in hostels due to the distance between their schools and the longhouse.

The activities of the inhabitants are mainly cultivation of pepper, cocoa, rubber and other cash crops while paddy and vegetables are mainly grown for their own consumption. Pig rearing and poultry farming served as sources of protein which are supplemented by fishing and hunting. The diet of the Ibans is mainly rich in carbohydrates as rice is the staple food. Affluent families eat more meat whereas poorer families supplement their rice with vegetables and tubers (wild yams, tapioca and sweet potato).

Water supply to this longhouse was mostly by gravity fed from dammed water in the upper stretches of rivers. Others use water from near-by streams for washing of clothes and bathing. Toilets consisted of pit latrines which are dugged near the long-house. All the adults use the toilets. Light was provided by pressure and hurricane lamps. A generator was available but this was only used on special occasions. Fuel for cooking consisted of firewood collected from the jungles. Most of the inhabitants sleep within mosquito nets. Mosquito coils were also used to keep mosquitoes away at night.

MATERIALS AND METHODS

1. Stool examination

Plastic stool packets with pressed seals were distributed to mothers in each household in the longhouse. The code number and name of each family member were written on the plastic packet. As many of the mothers were illiterate, a translator explained to the mother the method of stool collection. A date was fixed for the return of stool samples which were examined by the brine floatation and ether formalin concentration methods.

2. Blood examination

Thin and thick blood films were obtained from 163 inhabitants for the detection of malaria and filarial parasites. The blood samples were obtained with a finger prick using disposable stylets. The time of blood collection was from 10.00 pm to 11.00 pm. Thick blood films thus collected were air-dried whereas thin blood films were fixed in methyl alcohol before transportation to the laboratory for staining with Giemsa.

RESULTS

A total of 142 stool samples were collected from the inhabitants of the longhouse. The prevalence and types of intestinal parasites (protozoans and helminths) among these inhabitants are shown in Table 1. Two-thirds (67.6%) of the inhabitants were infected with intestinal parasites, of whom 64.8% had parasitic helminths, 8.5% had intestinal protozoans and 5.6% had both intestinal helminths and protozoans. Among the intestinal helminths, hookworms and *Trichuris* were the most common (47.2% and 43.9% respectively). Among the protozoan infections, *Entamoeba coli* was the most common (4.91%) whereas only 2.8% of the inhabitants had *Giardia lamblia*. The distribution of intestinal parasites according to age and sex was shown in Table 2. Prevalence of infection was high (67.1 - 86.7%) from early childhood (7 years) right through adulthood (over 19 years). In contrast, only 33.3% of children from birth to six years were infected with intestinal parasites.

TABLE 1: Prevalence of intestinal parasites among inhabitants of longhouse in Nanga Atoi.

Number examined: 142	Number infected	Percent infected
Parasitic infections	96	67.6
Helminthic infections	92	64.8
Protozoan infections	12	8.5
Helminths + protozoans	8	5.6
<i>Ascaris lumbricoides</i>	7	4.9
<i>Trichuris trichura</i>	61	43.0
Hookworms	67	47.2
<i>Enterobius vermicularis</i>	12	8.5
<i>Giardia lamblia</i>	4	2.8
<i>Iodamoeba butschlii</i>	2	1.4
<i>Chilomastix mesnili</i>	1	0.7

TABLE 2: Distribution of parasitic infections according to age and sex.

Age:	Number examined			Number infected			Percent infected		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-6 yrs	13	8	21	4	3	7	30.8	37.5	33.3
7-12 yrs	17	10	27	15	8	23	85.2	80.0	85.2
13-18 yrs	8	7	15	6	7	13	75.0	100.0	86.7
over 19 yrs	35	44	79	26	27	53	74.3	61.4	67.1
Total	73	69	142	51	45	96	69.9	65.2	67.6

Males appear to be most frequently infected at the 7 - 12 age groups there 88.2% of the boys were positive. This prevalence decreased slightly to 74.3% among boys over 19 years of age. Among girls, the highest prevalence was seen in the 7 - 18 age group where 80 - 100% of the girls were infected. Only 61.4% of girls over 19 years had parasitic infections. Infection among both boys and girls below 7 years of age was low (30.8 - 37.5%).

The types of helminthic (single or multiple) among these inhabitants are shown in Table 3. Single infections with only one species of intestinal helminth was slightly more common (56.0%) than multiple infections (44.0%). Among the single infections, 51.1% were single infections with hookworms and 44.7% had *Trichuris* alone. Single infections with *Ascaris* alone were not reported among these inhabitants whereas 4.2% had single infections with *Enterobius vermicularis* alone. Among the multiple infections, the majority (78.4%) had double infections with two species of helminths whereas only 21.6% had triple infections with three species of helminths. Among double infections, the majority (93.2%) was *Trichuris* mixed with hookworms. Triple infections were composed of *Trichuris* and hookworms mixed with *Ascaris* or *Enterobius*.

Among the 163 thin and thick blood films obtained from the inhabitants, none was seen to be infected with malaria or filarial parasites.

DISCUSSION

Two-thirds of the inhabitants in the longhouse in Nanga Atoi were infected with intestinal parasites. This prevalence (67.6%) among the Ibans was much higher than that observed among the Penans

TABLE 3: Types of helminthic infections among inhabitants of longhouse.

Types of infections:	Number infected	Percent infected
Single infections	47	56.0
Multiple infections	37	44.0
Total helminthic infections	84	100
Types of single infections:		
Hookworms	24	51.1*
<i>Trichuris trichura</i>	21	44.7
<i>Ascaris lumbricoides</i>	0	0
<i>Enterobius vermicularis</i>	2	4.2
Total single infections	47	100
Types of multiple infections:		
Double infections:	29	78.4**
<i>Triple infections</i>	8	21.6
Total multiple infections	37	100
Types of double infections:		
<i>Trichuris</i> + Hookworms	27	93.2***
<i>Ascaris</i> + <i>Trichuris</i>	1	3.4
<i>Ascaris</i> + Hookworms	1	3.4
Total double infections	29	100
Types of triple infections:		
<i>Ascaris</i> + <i>Trichuris</i> + Hookworms	4	50.0
<i>Enterobius</i> + <i>Trichuris</i> + Hookworms	4	50.0
Total triple infections	8	100

* Percent of total single infections (47)

** Percent of total multiple infections (37)

*** Percent of total double infections (29)

(35.0%) in the Upper Baram district of the Fourth and Fifth Divisions of Sarawak¹. The difference in the prevalences of intestinal parasitism among these indigenous groups in Sarawak is due primarily to differences in their way of life. The Ibans live in longhouses and practise cultivation on a permanent basis thus making possible the contamination of the environment with human faeces. On the other hand, the Penans still lead a semi-nomadic life and the majority of them preferred to hunt for wild plants and game in the deep jungles instead of cultivation and animal husbandry.

Soil-transmitted helminths among Ibans was high from seven years right through to those over 19 years of age. While only one-third of young Iban boys and girls below seven years of age was infected with intestinal parasites, about two-thirds or more of them (61.4 - 100%) had acquired intestinal parasitic infections by the age of seven years. This high prevalence was maintained right through from childhood to young adulthood (7 - over 19 years) in both males and females. However, Iban boys reached the highest prevalence at an earlier age (7 - 12 years) than girls (13 - 18 years). This may be due to the fact that boys are generally more active than girls and are therefore more exposed to the sources of infection at an earlier age.

Hookworm infection among the Ibans was expected to be high (47.2%) as human faeces would be used as a source of fertiliser and some inhabitants would still go about bare foot. Despite the presence of latrines in most households, there must still be considerable amount of faecal contamination by children. *Ascaris*, which is very common among the inhabitants of most communities studied in West Malaysia^{2,3}, was very low among this population of Ibans. While the commonest type of double infections in all communities studied in West Malaysia was *Ascaris* mixed with *Trichuris*, the commonest double infection reported among the Ibans was *Trichuris* mixed with hookworms.

The low prevalence of giardiasis among the Ibans indicated that their source of water is relatively safe and uncontaminated. Other water-borne intestinal protozoan infections (amoebiasis) are also uncommon.

Filariasis is patchily distributed in Sarawak whereas malaria has not been reported in the state so far. The low prevalence or absence of these infections in Sarawak is due primarily to the absence of suitable vectors for the transmission of these diseases. Besides, the practise of vector control measures like use of mosquito nets and coils would reduce any existing transmission within the region.

ACKNOWLEDGEMENTS

The authors are indebted to the Sarawak Health & Medical Services Department, Royal Malaysian Air Force, Department of Social and Preventive Medicine, University of Malaya, Johnson & Johnson Sdn. Bhd., Pfizer Private Limited, Smith, Kline & French Sdn. Bhd., Roche (Malaysia) Sdn. Bhd. and all the participants of Baktisiswa Sarawak 1987, University of Malaya.

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