

Parasitic Infections among Aborigine Children at Post Brooke, Kelantan, Malaysia

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Summary

This study investigated the prevalence of parasitic infections among aborigine children at Post Brooke, Kelantan. Eighty-four formalin-fixed specimens and 78 PVA-fixed specimens were obtained. 79.8% and 35.9% of the samples were positive for helminth ova and protozoa respectively. The parasites detected (single plus mixed infections) were *A. lumbricoïdes* (50/84, 59.5%), *T. trichiura* (35/84, 41.7%), hookworm (5/84, 6.0%), *S. stercoralis* (1/84, 1.2%), *G. intestinalis* (18/78, 23.1%), *E. histolytica* (7/78, 9.0%) and *E. coli* (7/78, 9.0%). Two hundred thick blood film examinations detected only one case of *Plasmodium falciparum* infection. A high prevalence of intestinal parasitic infections among the children at Post Brooke was demonstrated in this study; thus there is an urgent need to improve the hygiene, education and living standards of this population.

Key Words: Aborigine children, Parasitic infections

Introduction

The aborigines population in peninsular Malaysia is estimated to be about 103 795 (1997 census, Health and Medical Administrative Office, Kelantan-Terengganu Dept. of Aboriginal Affairs, Kota Bharu, Kelantan). Many programs have been set-up by the government to upgrade their health and socioeconomy. The aim of this study, conducted in May 1996, was to assess the prevalence of parasitic infections among children in an aboriginal community at Post Brooke in the state of Kelantan. Health services are flown to this area at 3-monthly intervals. There is a small clinic, manned by a medical aid to deal only with minor ailments and injuries. Other cases will be transported to the nearest town hospitals. However, the local 'traditional healers' are usually consulted first for any illness. The results of this study will serve as an indicator of the general health status of the community.

Materials and Methods

Post Brooke is situated about four hour uphill drive (through a lodging track) from Gua Musang, Kelantan and about 1.5 hour downhill drive from Tanah Rata, Cameron Highlands, Pahang. The total population of Post Brooke is about 1000 people. They communicate in their own language but they could also speak the Malay Language. The aborigines had been resettled into villages near the jungles they accustomedly nomadized.

Six out of 12 villages (179 families, 200 children) were randomly chosen for the study. Their homes were visited and parents of the children were interviewed on health-related practices such as sources of food, water and toilet habits. The children were 1-12 years old; 99 were school goers (ages 7-12); 36 were preschoolers (ages 5-6) and 65 were toddlers (ages 1-4). Two types of labelled stool containers were

distributed to each child i.e. one containing 10% formalin and one containing polyvinyl alcohol (PVA) fixative. The parents were advised on how to collect the stool specimens. Eighty-four formalin-fixed specimens and 78 PVA-fixed specimens were returned. In the laboratory, the formalin-fixed specimens were examined for helminth ova using both the direct smear and formalin-ether concentration method. Examination for the presence of protozoan infections were performed on the PVA-fixed stool specimens by direct smear and formalin-ether concentration technique. Stool samples which were suspected to be positive for the protozoan infections were stained with trichrome.

Two hundred finger-prick blood specimens were obtained in the day time to determine haemoglobin levels by cyanomethaemoglobin technique and to detect the presence of blood parasites. Thin and thick blood smears were made on microscopic slides; the former were methanol-fixed in the field. In the laboratory, the slides were stained with Giemsa and examined microscopically for the presence of malarial and filarial parasites.

Results

Table I shows the prevalence of intestinal parasitic infections among the study population. 79.8% of the stool sample were positive for helminth ova; *Ascaris lumbricoides* (59.5%, single and double infections) being the most common soil-transmitted helminth infection, followed by *Trichuris trichiura* (41.7%, single and double infections). However, the rate of hookworm infection is rather low (6.0%). Analysis of the stool samples for protozoan infections showed a 35.9% positivity rate, with *Giardia intestinalis* (23.1%, single and double infections) being the commonest protozoa, followed by *Entamoeba histolytica* (9.0%) and *Entamoeba coli* (9.0%). Blood smear examinations for malarial and filarial parasites showed only one positive slide for *Plasmodium falciparum* and no filarial organism.

Ninety children (45%) were observed to have depigmented hair and eight-nine (44.5%) children were anaemic with haemoglobin values less than 10 mg/dl. A survey of their hygiene habits showed that thirty-five families (19.6%) had proper toilets while the rest

(80.4%) used the river and bushes for defaecation. The use of river for washing and drinking is a common practice despite being supplied with a community gravity feed water system.

Table I
Intestinal parasitic infections among aboriginal children at Post Brooke, Kelantan, Malaysia

Parasites	No. infected	%
Helminth		
<i>Ascaris lumbricoides</i>	38	45.2
<i>Trichuris trichiura</i>	23	27.4
Hookworm	5	6.0
<i>Strongyloides stercoralis</i>	1	1.2
<i>Ascaris</i> + <i>Trichuris</i>	12	14.3
Protozoa		
<i>Giardia intestinalis</i>	16	20.5
<i>Entamoeba histolytica</i>	7	9.0
<i>Entamoeba coli</i>	5	6.4
<i>Giardia</i> + <i>E. coli</i>	2	2.6

Note: Total number of specimens for helminth ova and protozoa detections were 84 and 78 respectively.

Discussion

The health status of the aborigine children as measured by the rate of parasitic infections was unsatisfactory. The unsanitary living environment in over crowded homes, and the habits of infrequent washing of their bodies and clothes predispose these children to parasitic infections transmitted by the fecal-oral route. Almost 80% and 36% of the children were infected with soil-transmitted helminths and protozoa respectively. *Ascaris lumbricoides* is the most common gastrointestinal parasite infection in these children. In a study on effects of parasitic infections on central nervous system integrity of children, the intensity of *A. lumbricoides* infection was correlated with verbal ability and with neuropsychological performance³. As this may affect their performance at school and in later life, serious effort must be taken to reduce or eradicate the parasitic infections in the aborigine children.

The observations of depigmented hair and anaemia in 45% and 44.5% of the children respectively, are

probable indicators of malnutrition. Several studies have shown the correlation between malnutrition and infection with soil-transmitted helminths^{1,2}. Treatment of undernourished school children for intestinal helminth infections have been shown to improve growth, appetite and physical fitness^{4,5}. Their staple food is tapioca and they rarely consume protein food sources, which were obtained from their occasional hunting activities; the unbalanced diet may thus further predispose them to infections.

A study conducted among 93 children in another aboriginal community (Pangsoon, Selangor) also demonstrated high rates (79.6%) of parasitic infections in the paediatric population. The main helminthic infections were noted to be ascariasis (58%), followed by trichuriasis (36.6%). The protozoan parasites detected were mainly *G. intestinalis* (10.8%) and *Cryptosporidium* sp. (10.8%)⁶. In another study on the aborigines at Temenggor, Perak, the population aged 1-10 years (25 children) had a relatively lower rate of soil-transmitted helminth infections i.e. 24% *T. trichiura* infection, 20% *A. lumbricoides* infection and 16% hookworm infection. However, these children had rather high rates of protozoan infections, mainly *E. histolytica* (61.5%) and *G. intestinalis* (23.1%)⁷. Since the parasitological techniques used in this study is similar to the techniques employed in the Temenggor study, the higher *Entamoeba histolytica* infections in the Belum aborigines could be attributed to the relatively more number of streams and rivers around their settlements, many of which may be polluted.

Vector-borne blood parasitic infections do not seem to be a current health problem for the children. Surveys by the Malaria Control Team in 1994 recorded only three malaria cases as compared to 129 cases in 1992. The nocturnal subperiodic strain of *Brugia*

malayi is the predominant filarial species in this region. Blood specimens taken at daytime could have accounted for the absence of microfilaria detection in this study. However, during the past few years, there have been no report of filarial infection in this area. The regular vector control programs including distribution of insecticide impregnated bed nets have shown to be effective in controlling these blood parasites (1994 reports, Kelantan-Terengganu Dept. of Aboriginal Affairs).

Greater efforts are required to instil the understanding of hygiene and health care awareness among the aborigines. Increase in provisions of basic amenities such as pipe water and toilets are also necessary. Emphasis should be placed on the planning, implementation and evaluation of more programs to increase the economic and social status of these people. Presently the aborigines, to a certain extent, are still a gathering and hunting society.

In conclusion, the high rates of parasitic infections among aborigine children at Post Brooke indicated a low health standard of this indigenous community. A bigger and well-staffed clinic is urgently required to ensure adequate health services to the community, including regular administrations of antihelminthics to the children. A lot of effort will be required to resolve the contributory factors such as malnutrition, unhygienic living conditions and low socioeconomic status.

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