

PREVALENCE OF INTESTINAL PARASITES AMONG MEMBERS OF THE PUBLIC IN KUALA LUMPUR, MALAYSIA

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Abstract. A total of 246 stool samples were collected from the public who participated in a Medical Fair held at the University Malaya Medical Center. The stools were examined for intestinal parasites using the formalin-ether concentration technique. The overall infection rate was 6.9% (17 out of 246), with *Trichuris trichiura* being the most common parasite (4.5%), followed by *Ascaris lumbricoides* (0.8%), *Clonorchis sinensis* (0.8%), hookworm (0.4%), and *Entamoeba histolytica* (0.4%). None of these participants showed any clinical symptoms. The highest infection rate was among the Chinese 7.7% (13 out of 169), followed by the Malays 7.0% (3 out of 43) and Indians 3.3% (1 out of 30). The highest infection rate was in the age group 16-30 years, which was 9% (6 out of 67). The two cases of clonorchiasis were from two Chinese women aged 28 and 66 years. The 28-year-old Chinese woman was born in Malaysia and had never left the country, while the older woman was also born in Malaysia but had visited Hong Kong as a tourist on two occasions. Both enjoyed eating raw fresh water fish with porridge.

INTRODUCTION

Numerous studies have been carried out to find the prevalence of intestinal parasites among inhabitants of both urban and rural areas in Malaysia. However, these surveys were usually targeted towards special groups, such as hospital patients (Khan and Anuar 1977; Hamimah *et al*, 1982), pre-school or primary school children (George and Yang, 1982; Kan, 1984; Kan and Poon, 1987; Rajeswari *et al*, 1994; Rahman, 1998; Lee *et al*, 1999; Abdulla *et al*, 2002), plantation workers and their families (Sinniah *et al*, 1978, 1992), Orang Aslis (Karim *et al*, 1995; Rahmah *et al*, 1997; Norhayati *et al*, 1998), farming communities as well as low-income population groups in urban slums or low-cost flats and residential areas (Chia *et al*, 1978; Kan *et al*, 1987; Neo *et al*, 1987; Sagin *et al*, 2002). While most of these studies indicated infection rates ranging from 20% to over 90%, little is known about the prevalence of intestinal parasitism among the public communities in Kuala Lumpur.

Kan (1988) reported that these enteric parasitic diseases are highly prevalent and widely distributed among all ethnic groups and age groups

in many parts of Malaysia. The endemicity of these fecal, soil and water-borne diseases is an indication of the environmental sanitation and socioeconomic status of the community, being more common in both urban and rural disadvantaged communities, where living conditions, environmental cleanliness as well as personal and domestic hygiene were poor (Lai, 1992).

The following study was carried out to obtain the prevalence of common intestinal parasites among members of the public in Kuala Lumpur, the capital city of Malaysia.

MATERIALS AND METHODS

Plastic stool packets with pressed seals were distributed to members of the public participating in the Medical Fair held in conjunction with the Silver Jubilee Week of the University Malaya Medical Center, Kuala Lumpur, Malaysia. Each stool packet was labeled with the name, age, and sex of the participant. The race and address of each person were recorded separately. All stool specimens that were returned were examined microscopically for protozoan cysts and helminth eggs. The formalin-ether sedimentation technique was used for examination of stool samples, as this concentration technique is suitable for the detection of both protozoan cysts and helminth eggs in low as well as heavy infections.

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RESULTS

A total of 246 stool samples from Malay, Chinese and Indian children and adults aged between 2 and 66 years were examined for intestinal parasites. The overall infection rate was 6.9% (17 out of 246), as shown in Table 1. *Trichuris trichiura* was the most common intestinal parasite (4.5%). Infection with other intestinal parasites include *Ascaris lumbricoides*, hookworm, *Clonorchis sinensis* and *Entamoeba histolytica*. The majority of these positive cases (15 out of 17) were single infections; the remain-

Table 1
Prevalence of intestinal parasites from 246 stool samples.

Parasite	Number positive	% positive
<i>Trichuris trichiura</i>	11	4.5
<i>Ascaris lumbricoides</i>	2	0.8
Hookworm	1	0.4
<i>Clonorchis sinensis</i>	2	0.8
<i>Entamoeba histolytica</i>	1	0.4
Total	17	6.9

Table 2
Distribution of intestinal parasites according to race.

Race	Number examined	Number infected (%)
Malays	43	3 (7.0)
Chinese	169	13 (7.7)
Indians	30	1 (3.3)
Others	4	-
Total	246	17 (6.9)

Table 3
Distribution of intestinal parasites according to age and sex.

Age (years)	Total population			Male			Female		
	No examined	No. +	%+	No. examined	No. +	%+	No. examined	No+	%+
0-15	61	3	4.9	43	2	4.6	18	1	5.5
16-30	67	6	9	28	1	3.6	39	5	12.8
>31	118	8	6.8	54	3	5.5	64	5	7.8
Total	246	17	6.9	125	6	4.8	121	11	9.1

ing two infected persons had *Trichuris trichiura* with *Entamoeba histolytica* and *Trichuris trichiura* with *Ascaris lumbricoides*, respectively.

The distribution of infection among the different races is shown in Table 2. Chinese showed the highest infection rate (7.7%), followed closely by Malays (7.0%). Only 3.3% of Indians examined were infected with intestinal parasites.

The population was divided into 3 age groups because of the comparatively small sample size: birth to 15 years, 16-30 years, and over 31 years. The distribution of infection among males and females in the different age groups is shown in Table 3.

The overall infection rate was highest among the age group 16-30 years (9%) followed closely by those over 31 years (6.8%). Only 4.9% of children from birth to 15 years were infected. The overall infection rate among females was 9.1%, almost twice that of males (4.8%).

DISCUSSION

As is expected of most urban advantaged communities, the infection rate in our study was low (6.9%). This is mainly due to the good living conditions of inhabitants in affluent urban areas. In such communities, transmission of intestinal parasites is low because of adequate sanitation and water supply. The results were obtained from single stool samples, which are neither satisfactory nor desirable for surveys of intestinal parasites. However, as the participants were requested to return the stool samples for examination as part of the services offered during the Medical Fare, it was not possible to request them to return multiple samples. The infection rate of 6.9% may be an underestimate.

Trichuris trichiura was the main parasite found in our study. The source of infection for this parasite is probably hawker food. Because of the special mode of attachment of *Trichuris trichiura* to the cecal mucosa, the longer life-span of this parasite, as well as its refractory reaction to most anthelmintics, *Trichuris trichiura* tends to persist even in urban communities, even though sources of infection are low and exposure to infection is minimal. The overall low infection rate with the other intestinal helminthes, such as *Ascaris lumbricoides* and hookworm, may be due to the fact that most urban populations have been dewormed through school health programs or by private physicians.

Infection with water-borne intestinal protozoans, such as *Entamoeba histolytica* and *Giardia lamblia*, was expected to be low or absent because of the easy accessibility of a clean water supply.

There were not many differences in the distribution of infection among the various races from urban advantaged communities because of the similar standard of living, life-style and eating habits of urban people. While overall infection rates among females appeared to be higher than males in this study group, this difference in distribution was not pronounced.

The overall high infection rate with intestinal parasites recorded in the age group of 16-30 years may be due to the fact that this is the age group of schoolchildren and working people who are most likely to be exposed to infection through hawker food. In contrast, younger children, especially infants, toddlers and pre-schoolchildren in urban affluent homes would not be exposed to much infection, unlike their disadvantaged counterparts in unsanitary urban slums where the highest infection rates have been reported among children 3-15 years of age (Chia *et al*, 1978).

The two very interesting cases of clonorchiasis were from two Chinese women, aged 28 and 66 years, respectively. Both the women subsequently came to seek medication. The 28-year-old Chinese woman was born in Malaysia and had never left the country. The 66-year-old Chinese woman was also born in Malaysia but had visited Hong Kong as a tourist on two occasions. Both women had a history of regularly

eating porridge into which slices of raw fresh-water fish were stirred first before eating. They also professed to enjoy eating raw fish, especially during the first 15 days of the Chinese New Year. Their infection may have been acquired from eating raw fresh-water fish; which was imported from China and reared in ponds locally.

Clonorchiasis in Malaysia has been reported predominantly in Chinese with a history of travel to endemic countries. Twenty-three cases of liver fluke infections have been reported in Malaysia, out of which 11 cases were *Clonorchis sinensis* and 12 cases were *Opisthorchis* spp. All the twenty-three cases of clonorchiasis and opisthorchiasis reported in Malaysia were restricted to people of Chinese origin. This is accounted for by the predilection of the Chinese to eat raw fish (Chandra Shekhar *et al*, 1995). Clonorchiasis is endemic in many parts of Asia; the question of whether it is also endemic in Malaysia is still controversial. King (1968) reported a case of recurrent pyogenic cholangitis caused by *Clonorchis sinensis* in a Malaysian Chinese man who had never been out of Malaysia. He and his family were fond of raw fish dishes, especially during Chinese New Year. He volunteered the information that the fry of this fish was flown into Malaysia, often from Hong Kong, to be reared in local fresh-water pools.

Rim (1990) reported that clonorchiasis has been recognized as one of the most important endemic diseases in Korea.

Kim *et al* (2002) did a survey among residents of Hamyang-gun, Korea during the period of January 2001 to March 2002. They managed to collect 1,041 stool samples from residents who visited a Public Health Center. They found the overall egg positivity rate for the Oriental liver fluke (*Clonorchis sinensis*) was 16%. The age group of 30-50 years had the highest egg positivity rates from 20% to 22%. The positive examinees were treated with praziquantel and educated individually to prevent reinfection. That paper also suggested that periodic examination, treatment as well as education of residents, should be continued and systematized.

A nationwide survey of the distribution of human parasites in China during 1988-1992 showed that *Clonorchis sinensis* was also endemic in China (Yu *et al*, 1994).

Verle *et al* (2003) surveyed the prevalence of parasitic infections in the mountainous province of Hoa Binh, Northwest Vietnam, involving 526 households of six ethnic groups; eggs of *Clonorchis* spp were found in 126 (5%) individuals.

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