

## Status of intestinal parasites infection among primary school children in Kampongcham, Cambodia

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**Abstract:** A survey was made to find the extent of intestinal parasite infection in Kampongcham, Cambodia in February 2002. A total of 251 fecal specimens were collected from Tonlebat primary school children and examined by formalin-ether sedimentation technique. The overall infection rate of intestinal parasite was 54.2% (males, 57.3%; females, 50.8%). The infection rate of intestinal helminths by the species were as follows: *Ascaris lumbricoides* 26.3%, *Echinostoma* sp. 15.6%, hookworm 6.4%, *Opisthorchis* sp. 4.0%, *Rhabditis* sp. 2.4%, and *Trichuris trichiura* 0.4%. The infection rate of intestinal protozoa were as follows: *E. coli* 7.6%, *G. lamblia* 3.2%, *I. butschlii* 3.2%, and *E. histolytica* 0.8%. More than two different kinds of parasites were found in 16.7% of the stool samples. All the children infected were treated with albendazole, praziquantel and metronidazole according to parasite species. The results showed that intestinal parasites are highly endemic in this area.

**Key words:** Cambodia, intestinal parasite, survey

Cambodia has been known as an endemic area for malaria and schistosomiasis (Meek, 1988; Singhasivanon, 1999; Urbani et al., 2002). The infection status of intestinal parasites in Cambodia, however, has not yet been thoroughly investigated. Only several reports show Cambodian refugees infected with intestinal parasites including nematodes, trematodes and protozoa (Nwanyanwu et al., 1989; Lurio et al., 1991; Gyorkos et al., 1992). With aids of a local Korean missionary in

Cambodia and a medical service team from Wonju Christian hospital, we performed stool examinations. In February 2002, we collected 251 stool samples from Tonlebat primary school children in Kampongcham, Cambodia. Kampongcham city is located 80 km from Phnom Penh to the northeast. Formalin-ether sedimentation technique revealed intestinal helminth eggs of *Ascaris lumbricoides*, *Trichuris trichiura*, hookworm, *Rhabditis* sp., *Echinostoma* sp. and *Opisthorchis* sp., and protozoan cysts of *Entamoeba histolytica*, *Entamoeba coli*, *Giardia lamblia* and *Iodamoeba butschlii*, respectively. Of the 251 stool specimens, 136 (54.2%) were positives. The positive rates of boys and girls were 57.3%

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and 50.5%, respectively. Data revealed the highest positive rate as 26.3% for *Ascaris lumbricoides*, followed by 15.6% for *Echinostoma* species (Table 1). Multiple parasite infections were found in 16.7% of the stool specimens. There was no cestode infection. The infection rates ranged from 48.7% to 59.6% by the grade, and the highest rate was noticed in second grade schoolchildren. It was interesting to compare trematode infection with their eating habits. In general, they did not consume raw fresh water fish (Story and Harris, 1989), however, are thought to be infected by insufficiently cooked fish. *Opisthorchis* infection rate was 4.0%. Not only *Opisthorchis* species but also *Echinostoma* species were important trematode parasites in need of treatment. Anti-helminthics were sent

to Tonlebat primary school after stool examination. The school is located along the Mekong river. Although, many children were swimming in the river during the stool examination we could not find *Schistosoma* eggs. Considering swimming habits, the area is considered to be no schistosomiasis endemic area.

This survey showed that Tonlebat primary school children are prevalently infected with intestinal parasites, especially trematode such as *Echinostoma* species. Similar results were also obtained from around the survey area. A periodic survey on the intestinal parasite infections, treatment of infected cases, education of eating habit, and improvement of the sanitations are recommended for the parasite control in Kampongcham city,

**Table 1.** Prevalence of intestinal parasite infections among Tonlebat primary school children, Kampongcham, Cambodia

No. examined/positive (%)	Male	Female	Total
	131/75 (57.3)	120/61 (50.8)	251/136 (54.2)
<i>A. lumbricoides</i>	37 (28.4)	29 (24.2)	66 (26.3)
Hookworm	11 (8.3)	5 (4.2)	16 (6.4)
<i>T. trichiura</i>	-	1 (0.8)	1 (0.4)
<i>Rhabditis</i> sp.	2 (1.5)	4 (3.3)	6 (2.4)
Echinostomatidae	15 (11.5)	24 (20.0)	39 (15.6)
<i>Opisthorchis</i> sp.	6 (4.6)	4 (3.3)	10 (4.0)
<i>E. histolytica</i>	1 (0.8)	1 (0.8)	2 (0.8)
<i>E. coli</i>	8 (6.1)	11 (9.2)	19 (7.6)
<i>G. lamblia</i>	4 (3.1)	4 (3.3)	8 (3.2)
<i>I. butschlii</i>	5 (3.8)	3 (2.5)	8 (3.2)

**Table 2.** Prevalence of intestinal parasite infection by the grade among Tonlebat primary school children, Kampongcham, Cambodia

No. examined/positive (%)	grade	1	2	3	4	5	6
		36/21 (58.3)	52/31 (59.6)	39/19 (48.7)	39/19 (48.7)	40/21 (52.5)	45/25 (55.6)
<i>A. lumbricoides</i>		14 (38.9)	17 (32.7)	10 (25.6)	7 (18.0)	10 (25.0)	8 (17.8)
Hookworm		1 (2.8)	1 (1.9)	2 (5.1)	2 (5.1)	2 (5.0)	8 (17.8)
<i>T. trichiura</i>		-	-	1 (2.6)	-	-	-
<i>Rhabditis</i> sp.		1 (2.8)	2 (3.9)	1 (2.6)	-	-	2 (4.4)
Echinostomatidae		6 (16.7)	9 (17.3)	6 (15.4)	7 (18.0)	5 (12.5)	6 (13.3)
<i>Opisthorchis</i> sp.		3 (8.3)	3 (5.8)	-	1 (2.6)	2 (5.0)	1 (2.2)
<i>E. histolytica</i>		-	-	1 (2.6)	-	1 (2.5)	-
<i>E. coli</i>		3 (8.3)	3 (5.8)	1 (2.6)	2 (5.1)	3 (7.5)	7 (15.6)
<i>G. lamblia</i>		1 (2.8)	3 (5.8)	-	1 (2.6)	2 (5.0)	1 (2.2)
<i>I. butschlii</i>		-	3 (5.8)	1 (2.6)	1 (2.6)	1 (2.5)	2 (4.4)

Cambodia.

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