

Table 4. Comparison of Nutritional Status between Thai Laborers with and without Intestinal Parasites

| Item | Negative (n = 106) | | Positive* (n = 196) | | Overall (n = 302) | |
|------------------------------------|--------------------|-------|---------------------|------|-------------------|------|
| | No. | % | No. | % | No. | % |
| Body mass index < 18.7 kg/m | 7 | 6.6 | 8 | 4.1 | 15 | 5.0 |
| Hemoglobin < 13 g% | 3 | 2.8 | 6 | 3.1 | 9 | 3.0 |
| Eosinophils > 400/mm ³ | 50 | 47.2 | 83 | 42.3 | 133 | 44.0 |
| Lymphocytes < 1200/mm ³ | 106 | 100.0 | 195 | 99.5 | 301 | 99.7 |
| Albumin < 3.5 gm/dL | 0 | 0 | 0 | 0 | 0 | 0 |

*Laborers infected with 1 or more species of intestinal parasites.
Chi-Square test: $p > 0.05$.

multiple infection group was 3.2; the level of IgE was found to be significantly higher in infected laborers than in their uninfected counterparts (Student's *t*-test, $p < 0.05$). Moreover, there was a significant trend in the elevation of total IgE levels among negative laborers and those with single and multiple infections.

Nutritional Status

The nutritional status of the laborers was determined by an assessment of BMI, hemoglobin concentration, number of eosinophils, lymphocytes, and serum albumin. No significant differences were found in these parameters between laborers with and without intestinal parasites ($p > 0.05$). However, decreased total lymphocyte counts were observed in both groups of laborers (Table 4).

Liver Function Tests and Levels of Serum Total IgE

No significant difference in liver function tests was found between those laborers infected with *O. viverrini* and those with other intestinal parasites.

Results of Treatment

All 193 infected Thai laborers were treated. Two or 3 courses of pyrantel pamoate, mebendazole, praziquantel, and metronidazole were administered to 119, 45, 24 and 5 infected patients respectively. After 1 week of treatment, all results of stool examinations were negative. Twenty-five percent of these patients were found to have non-specific symptoms possibly related to their parasitic infections. These symptoms included anorexia (7.7%), diarrhea (7.2%), weight loss (7.2%), creeping skin eruption or urticaria (6.7%), nausea (6.2%), vomiting (5.6%), weakness (5.1%), abdominal pain (2.6%) and flatulence or dyspepsia (1.5%). Thirty percent of the laborers were found to

have adverse effects from treatment which included dizziness (9.7%), headache (9.7%), fever (9.7%), weakness (9.2%), severe cough (3.6%), rash (3.1%), abdominal pain (2.6%), itching (2.6%), nausea (2.1%), chills (2.1%), tinnitus (1.5%), flushing (1.0%), and diarrhea (0.5%).

DISCUSSION

O. viverrini is an important parasite in northern and northeastern Thailand.¹⁷ The overall prevalence has been estimated to be about 80% in the rural population and 55% in urban dwellers.^{7,18} Acquisition of infection has been determined to be related to the consumption of *koipla*, a dish prepared from uncooked freshwater fish. Not unexpectedly, in the present study, we found that this species was the most important intestinal parasite among Thai laborers and was significantly associated with the consumption of *koipla*. Moreover, the low income group (45.5%) was more likely to be infected than the high income group (27.6%). These findings suggest that *O. viverrini* infection may be related to the species or quality of fish used in preparing *koipla*. We also found that there was no significant difference in liver function of laborers infected with *O. viverrini* and those with other parasitic infections. These findings are similar to those reported previously.¹⁹

No *Entamoeba histolytica* was found by trichrome stain in any collected fecal specimens that were formed or semi-formed stools. This may have been influenced by treatment in Thailand.

Although parasitic infections have been found to be associated with the nutritional status of the host,⁸ I found no significant differences in anthropometric measurements of the laborers. According to a former