

THE PREVALENCE AND INTENSITY OF SOIL - TRANSMITTED HELMINTHS IN SOME RURAL VILLAGES IN NORTHERN PENINSULAR MALAYSIA

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Abstract. The prevalence and intensity of soil-transmitted helminths in five rural villages in northern peninsular were investigated. Generally the prevalence and intensity of infection were low in the 0 - 10 and above 50 year-old age groups when compared with other age groups. The prevalence and intensity of infection in the five villages were quite similar, because of similar socio-economic status. The highest intensity was observed for *Ascaris lumbricoides*, followed by hookworms and *Trichuris trichiura*.

INTRODUCTION

Parasite surveys and published reports from Malaysia have indicated that soil-transmitted helminths such as *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworm species are common infections in the country (Lie, 1964; Sandosham and Mohd Nordin, 1967; Lie *et al*, 1971; Kan, 1982; Cooper *et al*, 1992). However, data on the intensity of these parasites is scarce, and information on the status of these parasites in rural communities in northern peninsular Malaysia is lacking.

This paper describes the prevalence and intensity of infection of soil-transmitted helminths in some rural communities with reference to host age and sex.

MATERIALS AND METHODS

Study site

The study was conducted in five villages close to the campus of the University of Science, Penang, Malaysia. The villages are Titi Teras, Sungai Rusa, Permatang Pasir, Teluk Tempoyak and Kampong Binjai. The villages were selected on the basis of easy accessibility and also because they have almost similar socioeconomic status. Houses in the village are built of wood, roofed with nipah leaves or zinc sheets. A few houses have proper toilets, whilst in the majority of them, sewage disposal by the occupants are carried out by the beach, in shallow streams or under the shades of

trees. The sources of water are mainly from ponds, streams and rivers. The majority of the villagers are smallholder paddy and vegetable farmers, while chicken, goat, cattle and freshwater fish farming are also practised to some extent by the villagers. The nearest hospital is at Balik Pulau.

Fecal collection

Participating households were given glass bottles, and the next day fecal samples of approximately 10 g each were collected. In the laboratory, each sample was mixed thoroughly and a portion was fixed in 10% aqueous formaldehyde solution. Samples were examined by the modified Kato-Katz procedure (WHO, 1985). An indirect measure of helminth intensity was obtained by counting eggs expressed as eggs per gram (epg) of feces.

RESULTS

The main species of helminth observed in the fecal samples were *Ascaris lumbricoides*, hookworms and *Trichuris trichiura*. *Strongyloides* sp was infrequently observed and was not considered in this study.

The overall prevalence of *A. lumbricoides*, hookworms and *T. trichiura* for the five villages is shown in Table 1. Generally, there was no significant difference ($p < 0.05$) in prevalence rates between the three species of worms. Differences between the five villages were also not signifi-

Table 1

Overall prevalence and mean eggs per g feces (egg) of three species of helminths in the five villages.

Village	N	<i>Ascaris</i>	Hookworm	<i>Trichuris</i>
Titi		38.8%	26.8%	30.7%
Teras	204	337.1 ± 109.4	177.5 ± 88.7	111.7 ± 58.9
Sungai Rusa	105	36.7%	34.2%	29.5%
		1,025.3 ± 379.0	246.0 ± 667.2	121.7 ± 337.1
Permatang Pasir	173	45.2%	31.0%	38.7%
		2,007.4 ± 1,338.5	456.6 ± 321.5	78.8 ± 113.4
Teluk Tempoyak	92	34.5%	37.0%	36.7%
		1,837.4 ± 877.2	389.5 ± 410.3	181.7 ± 243.9
Kampong Binjai	132	46.2%	41.5%	30.7%
		763.9 ± 1,004.8	879.1 ± 245.9	321.0 ± 532.8

cantly different ($p < 0.05$). However, the highest prevalence for *A. lumbricoides* (46.2%) and hookworms (41.5%) was seen at Kampong Binjai, while that for *T. trichiura* was observed at Permatang Pasir (38.7%).

The prevalence of the three species, according to different age groups is shown in Fig 1. In general, the prevalence of *A. lumbricoides* was observed to be low in the 0 - 10 year-old age group, rising steadily with increasing age, peaked at the 21 - 30 year-old age group, and then tended to decline with progressive age groups. Almost similar trends were also observed for hookworms and *T. trichiura*.

The prevalence of the three species was not significantly different ($p < 0.05$) as regards to the sex of the host.

The intensity of infection (expressed as epg), was highest in *A. lumbricoides*, followed by hookworms and *T. trichiura* (Fig 2). Generally for all species, the lowest intensities were observed in the 0 - 10 and in the above 50 year-old age groups. However, in contrast to age groups, the sex of the host was not observed to be a significant factor ($p > 0.05$) in determining the intensities of the three species in all villages.

DISCUSSION

The patterns of prevalence and intensity of the

three species of helminths were quite similar between the five rural communities. This is not surprising, because the living styles and occupations of the villagers from the five communities are not very different from each other.

It is interesting to note that age group is an important factor with regard to both prevalence and intensity. Prevalence and intensity values tended to be lower in the earlier 0 - 10 year-old age group and also in the above 50 year-old age group. Similar trends in prevalence and intensity have also been observed in some rural communities in other tropical parts of the world too (Nwosu, 1983); Elkins *et al*, 1986; Bundy *et al*, 1987). Such phenomenon may probably be explained by behavioral changes with increasing age groups, and hence, exposure to infection by soil-transmitted helminths also may vary accordingly. This was further confirmed by the fact that only children at the later part of their primary school education (usually after 12 years old) were noted to be seen helping their parents in various activities related to paddy-planting, vegetable growing, or fish-farming. Also the elders of the village (usually above 50) seldom venture out to work in the fields, and were occasionally seen out of their houses on bicycles heading to the local sundry or coffee shops or to the neighborhood mosques for their daily prayers.

In conclusion, on the basis of these findings, the use of chemotherapy in rural villages of Ma-

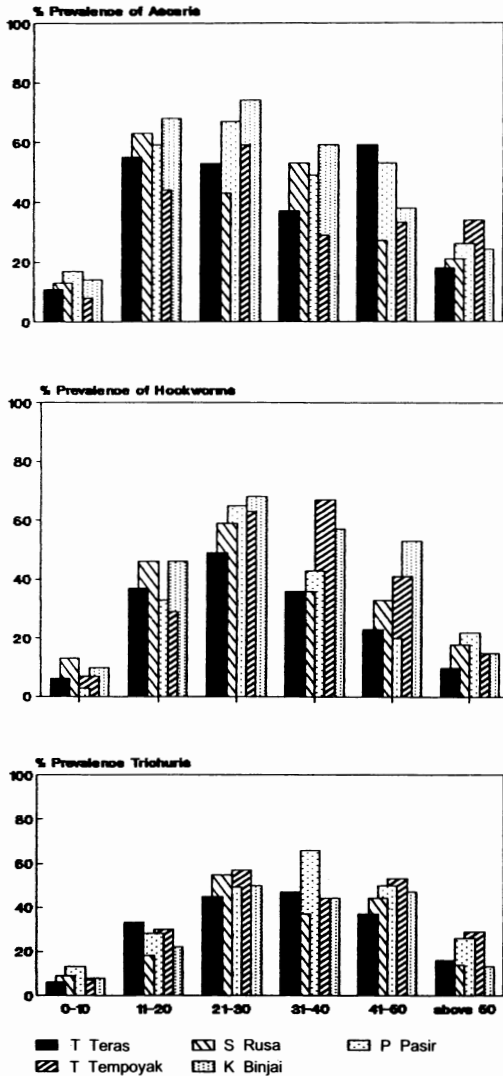


Fig 1—Prevalence of three species of helminths according to age groups for the five villages.

laysia should be aimed at the relevant age groups for successful reduction of worm infestation. Previous to this, only primary school children has been the target in chemotherapeutic regimes, and it is not surprising why in these communities the prevalence and intensity of soil-transmitted helminths were still quite high.

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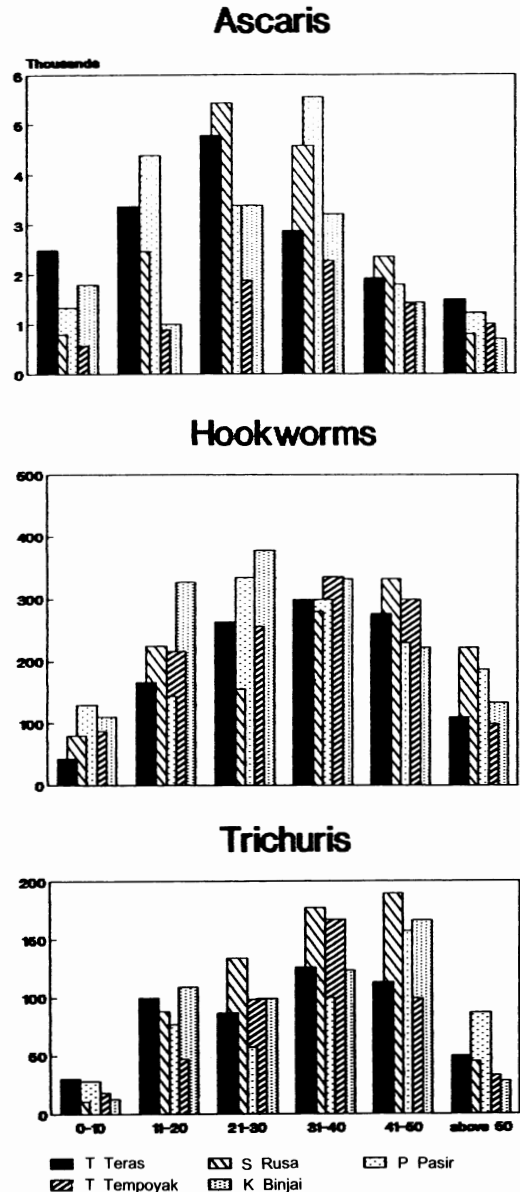


Fig 2—Intensity of infection (epg) according to age groups in the five villages.

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