

PREVALENCE AND TREATMENT OF INTESTINAL HELMINTHIC INFECTIONS AMONG CHILDREN IN ORPHANAGES IN JAKARTA, INDONESIA

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INTRODUCTION

Intestinal helminthic infections are common in Indonesia. High prevalences were mentioned in different areas of this country by several authors (Karniawan *et al.*, 1976; Margono *et al.*, 1979a; Abidin *et al.*, 1980; Partono *et al.*, 1980). Besides the soil-transmitted helminths, *Enterobius vermicularis* was found commonly in several groups of people (Kartanegara pers. comm., Margono *et al.*, 1979b; Daili *et al.*, 1972).

Studies revealed that high prevalences especially exist in institutions like those for old people, orphanages, schools, etc. (Beck *et al.*, 1959; Kartanegara pers. comm.) because good hygienic conditions are more difficult to maintain in institutions.

Therefore, the objective of this study was to investigate the infection rates of intestinal helminths and to treat the positive cases in orphanages in Jakarta.

MATERIALS AND METHODS

Three orphanages, consisting of one governmental and two non-governmental institutions were included in this study. Putra Utama is managed by the Social Welfare Department. The Muslimin orphanage is a Muslim institution and the Van der Steur orphanage is a Christian institution. Hygienic conditions in the three orphanages seemed to be more

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or less the same; and it could be graded as sufficient.

Stool containers were distributed to 158 children, age varying from 3-20 years; 50 children from Putra Utama (PU), 47 children from Muslimin (M) and 61 children from Van der Steur (VS) were examined. Two slides of each stool sample were examined by the modified Kato-Katz method (Margono, 1974) and one plastic bag was prepared, using the modified Harada-Mori technique (Kosin *et al.*, 1973). For the detection of *E. vermicularis* anal swabs were taken three times. The first swab was taken at 9.00 p.m. and the other swabs were taken the next two consecutive days in the morning before taking a bath. Stool examinations and anal swabs were done about seven days before and about one month after treatment.

Trivexan tablets (Mecosin) were given for treatment. One tablet consisting of 100 mg pyrantel pamoate and 150 mg of mebendazole, was administered as a single daily dose for three consecutive days.

RESULTS

At the three orphanages PU, M and VS the prevalences of the intestinal helminthic infections were respectively as follows: *A. lumbricoides* 70.0%, 76.6% and 50.8%, *T. trichiura* 78.0%, 93.6% and 70.5%, hookworm 20.0%, 12.7% and 3.2% and *E. vermicularis*, 34.0%, 29.8% and 59.0% (Table 1 and Table 4). Multiple soil-transmitted

Table 1

Prevalences of soil-transmitted helminths in three orphanages in Jakarta.

Helminths	Putra Utama	Muslimin	Van der Steur
	No. 50	No. 47	No. 61
<i>A. lumbricoides</i>	70.0	76.6	50.8
<i>T. trichiura</i>	78.0	93.6	70.5
Hookworm	20.0	12.7	3.2

Table 2

Cure rates and egg reduction rates after treatment with Trivexan.

Helminths	Putra Utama		Muslimin		Van der Steur	
	Cure rate	E.R.R.	Cure rate	E.R.R.	Cure rate	E.R.R.
<i>A. lumbricoides</i>	96.0	99.7	100	100	100	100
<i>T. trichiura</i>	78.0	94.2	80.9	97.4	86.9	98.5
Hookworm	98.0	95.8	100	100	100	100

Table 3

Multiple soil-transmitted helminthic infection in three orphanages in Jakarta.

Helminth	Putra Utama	Muslimin	Van der Steur
	No.	No.	No.
<i>A. lumbricoides</i>			
+			
<i>T. trichiura</i>	22 (44.0)	30 (63.9)	22 (36.1)
<i>T. trichiura</i> + hookworm	3 (6.0)	2 (4.3)	-
<i>A. lumbricoides</i>			
+			
<i>T. trichiura</i> + hookworm	7 (14.0)	4 (8.5)	2 (3.3)
Total	32 (64.0)	36 (76.6)	24 (39.6)

Percentage positive shown in parenthesis.

Table 4

Prevalence and cure rates of *E. vermicularis* infection after treatment with Trivexan.

Orphanages	Percentage positive			Cure rate
	Male	Female	Total	
Putra Utama	35.3	31.3	34.0	82.3
Muslimin	27.3	35.7	29.8	92.9
Van der Steur	79.4	33.3	59.6	97.2

helminthic infections were found in 64.0%, 76.6% and 39.3% of the children respectively in the P U, M and VS institutions (Table 3). Trivexan tablets were used for treatment on account of the high prevalence of multiple infections.

Cure rates for *A. lumbricoides* were 96.0% 100% and 100%, for *T. trichiura* 78.0%, 80.9% and 86.0%, for hookworm 98.0%, 100% and 100%, for *E. vermicularis* 82.3%, 92.9% and 97.2% respectively from the three orphanages (Table 2 and Table 4).

Total egg count per gramme of stool before treatment were as follows: *A. lumbricoides* 374,850, 272318 and 361303, *T. trichiura* 11200, 21431 and 31903, hookworm 20150 1739 and 21289. After treatment the total egg count per gramme dropped to 950, zero and zero for *A. lumbricoides*, 650, 564 and 488 for *T. trichiura* and 850, zero and zero for hookworm.

Egg reduction rates of the children of the three orphanages respectively were for *A. lumbricoides* 99.7%, 100% and 100%, for *T. trichiura* 94.2%, 97.4% and 98.5%; for hookworm 95.8%, 100% and 100% (Table 2). Only one child complained of nausea.

DISCUSSION

Prevalences of soil-transmitted helminths in the three orphanages were comparable with the findings in school children in

several other studies (Margono *et al.*, 1979 a,b; Abidin *et al.*, 1980; Partono *et al.*, 1980). The intensity of infections of soil-transmitted helminths in the three institutions were considered low. However in other studies besides light infections a few heavy infections were discovered among school children (Margono *et al.*, 1979 a, b; Abidin, 1980; Partono *et al.*, 1980). In this study multiple soiltransmitted helminthic infections were frequently detected like in other investigations (Kurniawan *et al.*, 1976; Kan *et al.*, 1979; Margono *et al.*, 1979b).

Prevalences of *Enterobius* infections were 34.0%, 29,8% and 59.0% respectively in PU, M and VS institutions. Kartanegara (pers. comm.) found 30.9% of 291 children infected with *E. vermicularis*. The children were from families of low socio-economic level. Anal swabs taken in a pediatric ward in a hospital in Padang revealed 19.1% of 184 children positive for *Enterobius* eggs (Daili *et al.*, 1972). Of 140 stool samples of children in Obano, Irain Jaya, 16.4% were positive for *Enterobius* eggs. Positive anal swabs were found in 38.5% of the children, aged below 10 years (Margono *et al.*, 1979b, 1980). The prevalence of *Enterobius* infection in PU, M and VS institutions were not significantly different ($p > 0.05$)

The difference in prevalences in boys and girls of VS was significant ($p < 0.05$). The cause of this significant difference may be

possibly due to the different levels of personal hygiene in above mentioned groups.

On account of the high prevalence of multiple infections of soil-transmitted helminths, positive cases were treated with Trivexan containing 100 mg of pyrantel pamoate and 150 mg of mebendazole. Cure rates were high for *Ascaris*, *Trichuris*, hookworm and *Enterobius* infections respectively between 78 - 100%. Egg reduction rates for ascariasis, trichuriasis and hookworm infection were between 94.2 - 100%. High cure rates and high egg reduction rates were to be expected as this drug proved also to be highly efficient in several other trials (Abidin *et al.*, 1980; Partono *et al.*, 1980); moreover the intensity of the infections for the different intestinal helminths in this study was light in all cases. Only one child complained of nausea. Light side effects were also reported by Abidin *et al.*, (1980) headache in 5.9%, abdominal pain 3.4%, diarrhoea 2.9% and nausea 1.2% from a study of 241 children. The same side effects were also recorded by Partono *et al.*, (1980).

SUMMARY

A survey was carried out in three orphanages in Jakarta for intestinal helminthic infections. Stool samples and anal swabs of 158 children were examined. The prevalences of intestinal helminthic infections in the Putra Utama, Muslimin and Van der Steur orphanages were respectively as follows: *A. lumbricoides* 70.0%, 76.6% and 50.8%, *T. trichiura* 78.0% 93.6% and 70.5%, hookworm 20.0%, 12.7% and 3.2% and *E. vermicularis* 34.0% 29.8%, 59.0%. Treatment with Trivexan (100 mg of pyrantel pamoate and 150 mg of mebendazole), one tablet as a single daily dose for 3 consecutive days resulted in cure rates for *A. lumbricoides* 96.0%, 100% and 100%, for *T. trichiura* 78.0%, 80.9% and 86.9%, for

hookworm 98.0%, 100% and 100% and for *E. vermicularis* 82.3%, 92.9% and 97.2%. No side effects were observed, except in one child who complained of nausea.

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