

COMPARATIVE TRIALS USING ALBENDAZOLE AND MEBENDAZOLE IN THE TREATMENT OF SOIL-TRANSMITTED HELMINTHS IN SCHOOLCHILDREN ON PENANG, MALAYSIA

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Abstract. Trials using albendazole and mebendazole, as single 400 mg dose treatments, against soil-transmitted helminths, were carried out in 7-9 and 10-12 years-old schoolchildren living in urban and rural environments in Penang, Malaysia. Both drugs were equally effective in treating trichuriasis and ascariasis in both age groups and environments. However, mebendazole is not so effective in the treatment for hookworms when compared to albendazole. It is suggested that albendazole should be considered the drug of choice for mass chemotherapy for Penang.

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; Sulaiman *et al.*, 1977; Kan, 1982; Rahman, 1994). The morbidity of the infection and the dynamics of transmission are influenced by the intensity of the worm population in the relevant society. Worldwide, it has been shown that the prevalence of worm infestation has successfully been addressed by extensive improvements of sanitation and hygiene. Nevertheless, mass chemotherapy often has to be incorporated into the disease control programs.

The present study was carried out to compare the efficacies of two anthelmintic drugs, albendazole and mebendazole, as a single 400 mg dose treatment in 2 age groups (7-9 years and 10-12 years) living in two different environments, *ie* urban and rural.

MATERIALS AND METHODS

The study was carried out in July 1990. The subjects comprised of 7-9 and 10-12 years-old schoolchildren, from either a rural (Balik Pulau) or an urban (Georgetown) environment in Penang Island, West Malaysia. From Balik Pulau, a total of 98 children were selected, of which 46 are of the 7-9

years-olds, and 52 of the 10-12 years-olds. From Georgetown, a total of 94 children were selected, of which 44 were 7-9 years-olds, and 50 were 10-12 years-olds. All children selected in the study had not received any treatment for worms for the last 6 months prior to the study.

During baseline examination, a stool sample was collected from each subject, and examined using the formol-ether technique to study the prevalence of the helminth. At the time of stool collection, each subject received an anthelmintic drug. Half of each group and environment were randomly selected and given albendazole (400 mg) and the remaining half given mebendazole (400 mg). All drugs were consumed in the presence of the research team. One month later stool samples were collected from all subjects and examined again for prevalence of helminths. Cure rates were analysed with the chi square test.

RESULTS

Results of the cross-sectional study on prevalence and intensity of intestinal helminthic infections were reported in a previous paper (Rahman, 1996). Data from 192 children examined in the present study indicate that *Trichuris* was the most common nematode with a mean prevalence rate of 96.0%, followed by *Ascaris* (35.6%) and hookworm (19.2%), respectively.

The age-specific prevalence before treatment, and one month after treatment with albendazole in

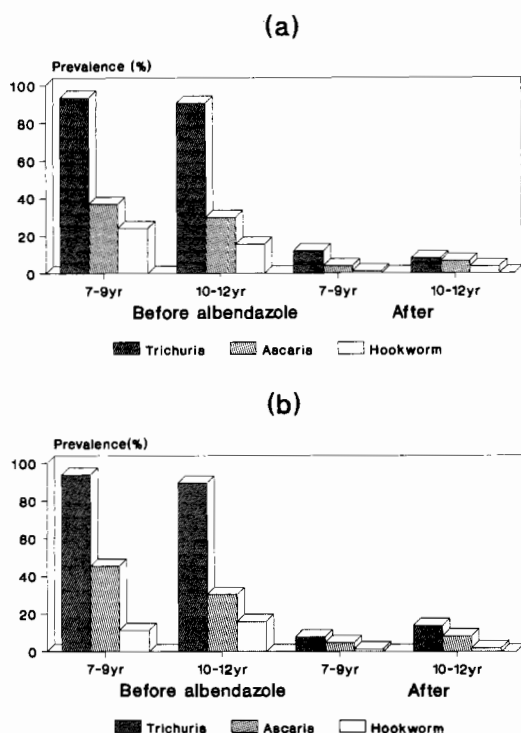


Fig 1—Age specific prevalence rates of *Ascaris*, *Trichuris* and hookworms, before, and after a single dose of albendazole in rural (a) and urban (b) schoolchildren from Penang Island, Malaysia.

rural schoolchildren is shown in Fig 1a. The overall cure rates observed were high in *Trichuris* (83.4%), *Ascaris* (87.3%) and hookworms (89.1%) infections. The overall cure rates observed for urban schoolchildren treated with albendazole were not significantly different ($p > 0.05$) from that of rural schoolchildren (Fig 1b); the overall cure rates were 82.3%, 90.9% and 88.1% respectively for the three species. There was no significant difference ($p > 0.05$) in the effect of treatment with albendazole between the two age groups for both rural and urban schoolchildren.

The effect of treatment with mebendazole is shown in Fig 2. The mean overall cure rates for the two age groups and environments were high for *Trichuris* (89.0%), and *Ascaris* (81.2%) infections. However, the effect of treatment was much less marked in infections with hookworms, with a mean cure rate of only 48.2%. The overall cure rates observed for urban schoolchildren treated with mebendazole were not significantly different ($p >$

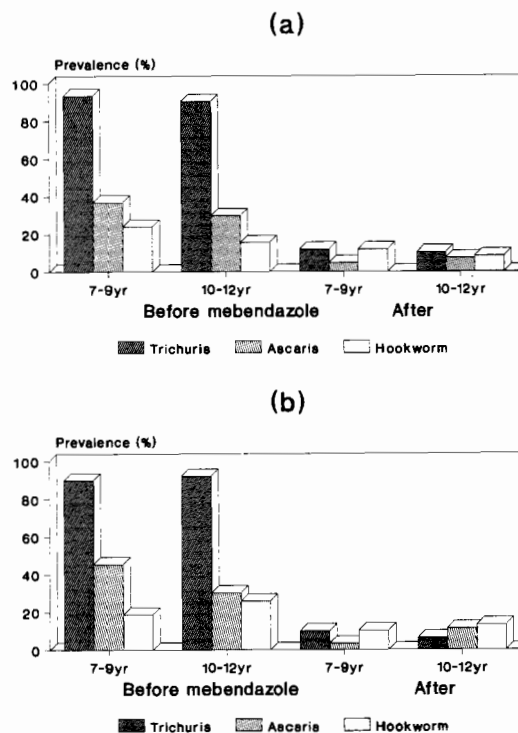


Fig 2—Age specific prevalence rates of *Ascaris*, *Trichuris* and hookworms, before, and after a single dose of mebendazole in rural (a) and urban (b) schoolchildren from Penang Island, Malaysia.

0.05) from that of rural schoolchildren (Fig 2b). No differences in treatment relative to age groups were noticed for both environments ($p > 0.05$).

The single dose treatments of albendazole and mebendazole were well accepted and tolerated by both rural and urban schoolchildren, with the exception of a few cases reporting of headaches and abdominal discomfort.

DISCUSSION

The results of the investigation indicated a high prevalence of soil-transmitted helminths in Penang. Levels of transmission of *Trichuris* and *Ascaris* are greater than that of hookworms, as shown by their pre-treatment prevalence rates. Although the hygienic and sanitary conditions of the rural are not as modern as that of the urban environment, nevertheless, they are clean, and are not in poor condition.

When the study was carried out, there is no noticeable indiscriminate defecation on the grounds, and the children were of the habit of wearing shoes or slippers. This explains the similarity of the dynamics of transmission between the two environments.

Albendazole and mebendazole were equally effective in treating trichuriasis and ascariasis. The results of the study confirmed the broad-spectrum activity of the two benzoimidazole derivatives against soil-transmitted helminths as reported by other workers elsewhere (Pene *et al*, 1982; Botero and Brugmans, 1989). However, albendazole seemed to be more effective than mebendazole against hookworm infections, although mebendazole achieves excellent cure rates for *Trichuris* and *Ascaris*.

Mebendazole has been reported to be less effective against hookworms than albendazole (WHO, 1987; Stephenson *et al*, 1989). Mebendazole has also been shown to be less effective towards *Trichuris* by Albonico *et al*, (1994), but not so in the present study. The previous study by Albonico *et al* (1994) incorporated adults in their treatment regime. Most children in the present study had not been treated before.

Considering that in both environments, there were high prevalences of *Trichuris* and *Ascaris* both albendazole and mebendazole could be used to effectively control trichuriasis and ascariasis. However, albendazole should be considered the drug of choice for mass deworming for Penang.

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