

Single Dose Treatment of Mixed Helminth Infections – A Comparison of Three Different Regimes

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Summary

Three different regimes using a single dose of anthelmintics are compared. Oxantel/pyrantel in a single dose of 20 mg/kg body weight, a combination of oxantel, pyrantel and flubendazole 200 mg in a single dose, and mebendazole in single dose of 600 mg were used (treatment regimes A, B and C respectively). All three regimes produced a significant egg reduction following treatment, in both whipworm and roundworm infection. There was no significant difference between the three treatment regimes, in cure rate, or egg reduction rates in ascaris infection. The combination of oxantel/pyrantel and flubendazole was superior to oxantel/pyrantel alone, or mebendazole in the treatment of trichuriasis.

Introduction

Previous studies have shown oxantel/pyrantel pamoates to be effective in a single dose, in the treatment of mixed helminthic infections^{1,2,3} especially in ascaris and trichuris infections¹. Since Trichuris infection is difficult to eradicate completely with a single dose of flubendazole as shown by our previous study⁴, this new combination of oxantel/pyrantel pamoates was administered to patients with mixed helminthic infections to determine its efficacy. This was compared with a group of patients who were given a single dose of 600 mg of mebendazole. Another group of patients was given a combination of oxantel/pyrantel pamoates and flubendazole, administered together as a single dose to determine whether there is an "additive" effect with these two different type of drugs.

Materials and methods

Patients aged 1 year to 14 years from an urban slum community in Kirillapona, Colombo, and patients aged 1 year to 12 years admitted to the University Paediatric Ward at the Lady Ridgeway Hospital, Colombo, who were found to have helminthiasis were selected. The drugs were administered by a public health inspector in the slum community, and by a nurse in the ward,

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who personally ensured that the drugs were swallowed. Uniform smears of stools were made by the use of a photoelectric light meter, which measures the density of the smear in terms of 1/200, 1/300, 1/400, 1/500 and 1/1000 gm of faeces. The number of ova per g. of faeces was determined by multiplying the egg count of the slide by the dilution factor⁶. Three technicians performed separate ova counts on each sample and the mean taken. One of the authors (UNP) supervised and cross checked the ova counts. Ova counts were repeated two weeks following treatment.

A total of 83 patients were treated. 20 patients had all three worms, 53 patients had double infections while 10 patients were infected with a single type of worm.

Cure was defined as 100% reduction in ova counts of that particular worm. Percentage reduction of the mean post-treatment ova count of the particular helminth, compared to the mean pre-treatment ova count was considered as the percentage egg reduction.

Drug regimes used were —

A — Oxantel / pyrantel pamoates 200 mg/kg — single dose

B — Oxantel / pyrantel pamoates 200 mg/kg + flubendazole 200 mg — single dose

C — Mebendazole 600 mg — single dose

Results

The results are summarized in Tables 1—3.

Table 1

Whipworm treatment results

Treatment regime	No. treated	Mean egg count/gm faeces		% egg reduction	Cure	
		Pre treatment	Post treatment		No.	%
A	43	16,581	4,907	70	9	21
B	12	9,166	750	92	7	58
C	14	7,071	2,214	69	4	29

Table 2

Roundworm treatment results

Treatment regime	No. treated	Mean egg count/gm-faeces		% egg reduction	Cure	
		Pre treatment	Post treatment		No.	%
A	46	169,174	2,000	99	43	9
B	18	23,888	0	100	18	100
C	21	42,333	286	99.3	20	9

Table 3

Hookworm treatment results

Treatment regime	No. treated	Mean egg count/gm-faeces		% egg reduction	Cure	
		Pre treatment	Post treatment		No	%
A	14	4,428	27	94	10	71
B	2	1,500	0	100	2	100
C	6	2,500	333	87	4	67

In regime A, there was no reduction in ova counts in one patient with trichuris infection, while there was a slight increase in ova counts in two patients. In regime C, there was a slight increase in the post treatment egg count in one patient with trichuris infection. All other post treatment egg counts in all three regimes were reduced.

The post treatment egg counts were significantly reduced in all three regimes, for whipworm and roundworm infections ($P < 0.01$ for all three regimes in whipworm infections and $P < 0.001$ for all three regimes in roundworm infections). There was no significant difference in the egg reductions rates between regimes A and C in whipworm infections ($P < 0.1$) but the egg reduction was significantly less in regime B compared to regimes A and C ($P < 0.05$). There was no significant difference in the egg reduction rates between the three regimes in roundworm infection.

In trichuris infections, the cure rate in regime B (58%) was significantly better than in regimes A (21%), and C (29%) — ($P < 0.05$). There was no difference in the cure rates between the three regimes in ascaris infections ($P > 0.05$).

The hookworm treatment results were not statistically analysed, because of the small numbers in regimes B and C.

Discussion

Our study shows that oxantel and pyrantel pamoates are not very effective in a single dose of 20 mg/kg in the treatment of trichuriasis, although a significant egg reduction rate (70%) was observed. The cure rate and egg reduction rates were not significantly different to the group treated with a single dose of mebendazole. This observation is in contrast to other studies^{1,2,3}. Lee and Lim (1978)¹ found an average cure rate of 87%, and an egg reduction rate of 92.3% with oxantel/pyrantel in whipworm infections and these authors concluded that oxantel/pyrantel was more effective than mebendazole in the treatment of ascaris and trichuris infections.¹

It is interesting to note a significantly better cure rate and an egg reduction rate when a combination of oxantel/pyrantel and flubendazole was administered, in whipworm infections. Although the egg reduction rate (92%) is encouraging in this group, the cure rate (58%) is not comparable. It appears these two drugs have a synergistic effect in the treatment of trichuriasis.

All three regimes were very effective in the treatment of ascaris infections (Table 2), confirming previous studies with oxantel/ pyrantel^{1,2,3} and mebendazole⁶. We have previously shown the efficacy of flubendazole in a single dose, in the treatment of ascariasis⁴.

All three regimes appear to give promising results in hookworm infections (Table 3), but more patients should be studied in future.

These results indicate that oxantel/ pyrantel is effective in a single dose of 20 mg/kg in the treatment of ascariasis, but not very effective in the treatment of trichuriasis. A significant egg reduction rate of 70% in whipworm infections makes it suitable for mass treatment programmes, since it is also very effective in ascaris infections. The absence of the side effect of migration of roundworms compared to flubendazole⁴, and mebendazole⁷, also favour its use in

mass treatment programmes. But a major disadvantage in a mass treatment project, is the difficulty in calculating the dosage on a body weight basis.

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