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EVALUATION OF THE EFFECT OF OXANTEL–PYRANTEL ON VARIOUS SOIL–TRANSMITTED HELMINTHS IN IRAN*

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ABSTRACT

The effect of a combination of Oxantel-Pyrantel with a single dose of 10 mg/kg body weight on *Trichuris trichiura, Ascaris, Trichostrongylus* spp. and *Ancylostoma duodenale* has been evaluated among the population of two rural areas in Khuzestan, Southwest Iran (41 persons) and Isfahan, Central Iran (30 persons).

All patients were infected with *Trichuris trichiura* and some simultaneously with one or more other helminths.

In addition to stool examinations, to elucidate the possible side-effects, several blood and urine tests were conducted before and after treatment.

A cure rate of 83% has been found among Trichuris cases treated in both areas. Cure rates observed for ascariasis and trichostrongyliasis were 93.3% and 23% in Khuzestan and 90% and 50% in Isfahan respectively.

Cure rate for ancylostomiasis was 86% in Khuzestan.

Significant reduction in the mean number of egg/gr of faeces has been observed.

Side-effects encountered were mild and transient. The promising effect of this drug on soil-transmitted helminths, particularly *Trichuris trichiura* has been proven.

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INTRODUCTION

Although several new and effective anthelminthic drugs have been introduced in recent years,[1,2] only few have been found effective on *Trichuris trichiura*. [3]

Recently, a combination of Pyrantel and Oxantel pamoate has been claimed to be effective on the above mentioned parasites as well as on *Trichuris trichiura*.

In this paper the result of a trial on the effect and side effects of this new compound on Ascaris, Trichuris, hookworm (Ancylostoma) and Trichostrongylus spp. will be presented.

MATERIALS AND METHODS

Evaluation of the drug has been conducted in two separate rural areas of Khuzestan, South West and Isfahan, Central part of Iran.

The common soil-transmitted helminths in Khuzestan consist of Ascaris, Ancylostoma, Trichuris (only in limited areas) and Trichostrongylus spp. and in Isfahan are Ascaris, Trichuris and Trichostrongylus spp.

In Khuzestan 41 patients in various age groups all infected with Trichuris, 33, 30 and 13 infected with Ascaris, Ancylostoma and Trichostrongylus respectively were chosen for treatment and 31 patients all infected with Trichuris and some with other parasites were used as the control.

In Isfahan, of 30 patients treated, all have been infected simultaneously with Ascaris and Trichuris, and six had Trichostrongylus spp. as well, and 14 patients were kept as controls.

Patients were treated with suspension of 50 mg of Oxantel + 50 mg pyrantel pamoate per ml of the drug with a single dose of 10 mg/kg body weight.

Methods of stool examination used were Ether formaline (for qualitative) and Stoll egg count (for quantitative assessment of infections).

The same methods were used for the follow-up of all patients undertaken 10 days after therapy in three consecutive days.

Blood and urine samples of each patient were examined, before and 10 days after treatment for indication of renal and hepatic toxicity of the drug. Blood tests including S.G.O.T., S.G.P.T., Lactic dehyrogenase, Alcaline Phosphatase, Amylase, Total Cholestrol, Creatinine, Non Protein Nitrogen, B.U.N., Urea, Haemoglobine, Packed cell volume, and white blood cells and differential count, and Urine examination were undertaken.

Patients were also clinically examined before and 24 hours after therapy to find out the side effects of the drug.

RESULTS

As is shown in Table 1, a cure rate of 83% has been found among persons infected with *Trichuris trichiura* in both areas, while the cure rates observed among people infected with *Ascaris lumbricoides* were 93.3% in Khuzestan and 90% in Isfahan.

For *Ancylostoma duodenale* the cure rate achieved was 86% found among the treated cases in Khuzestan.

For Trichostrongylus spp., the cure rate achieved was 23% in Khuzestan and 50% in Isfahan.

The intensity of all infections were much higher in Isfahan. While the mean numbers of egg/gr of faeces, before treatment for Ascaris, Trichostrongylus spp. and Trichuris were 8435, 150 and 222 respectively in Khuzestan. They were 52692, 591 and 592 in Isfahan.

Changes in the number of eggs/gr of faeces of various helminths, in remaining positive cases and controls, occurred after treatment were shown in Table 2.

The clinical side effects of the drug were generally mild and transient consisting of abdominal pain, 11.7%, headache, 8.3%, constipation, 6.9% dizziness, 2.7% and vomiting, 1.3%.

The result of the blood tests on S.G.O.T. and S.G.P.T. indicated mean values of 60.5, 42.9 before treatment and 55.2, 33.1 after treatment, showing high measures of Aminotransferase in almost all subjects before treatment, and in a lesser degree after treatment, but only four patients showed significant increase of these diastases after treatment.

The result of other biochemical and haematological tests of blood, as well as urine examination were in the normal range and no change and abnormality has been observed after treatment.

DISCUSSION AND CONCLUSION

Results obtained from this trial clearly indicate the high effectiveness of Oxantel-Pyrantel on trichuriasis and other intestinal helminthiasis commonly found in both areas.

However, based on the results of previous studies on the same areas,[4,3] in which the effect of various newly introduced compounds has been evaluated, it seems that Levamisole is more effective on trichostrongyliasis which is one of the highly prevalent infections among the population of both areas, and has similar effect on Ascaris and hookworm infections.

While the cure rates obtained coincide with the intensity of the infection and higher cure rates obtained for Ascaris and Trichostrongylus spp. in Khuzestan with lower intensity of infection than Isfahan, an increase of 54% egg/gr of faeces was observed among Trichuris cases treated in Khuzestan. The only explanation is that this increase occurred in seven remaining positive cases who were highly infected with this parasite and have not been completely cured.

The high effectiveness of the combination of Oxantel-Pyrantel in trichuriasis observed on this trial is comparable with the result of trial by Rim et al 1975[5] who found a cure rate of 73.2% by a single dose of 10 mg/kg and by Zaman and Sabapathy in 1975[6] who observed cure rates of 65%, 88% and 100% by using single doses of 10 and 15 mg/kg in one day and 10 mg/kg for three days.

Results obtained from these trials are very encouraging, because, among the newly introduced drugs the only compounds effective on trichuriasis are Diphetarsone, Mebendazole and Oxantel.

Because of the possible toxicity and side effects and long duration required for its administration, Diphetarsone is not suitable for mass-treatment. The use of Mebendazole which also requires to be administered in six divided doses will be costly for mass-treatment, thus the Oxantel-Pyrantel might be the drug of choice for the individual and mass-treatment of trichuriasis, ascariasis and ancylostomiasis.

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Table 1
Cure Rates among 41 patients of Khuzestan, 30 of Isfahan treated by Oxantel-Pyrantel and 27 control cases of Khuzestan and 14 of Isfahan. (1976)

Place of Trial		Ascaris lumbricoides	Hookworm	Trichostrongylus spp.	Trichuris trichiura
Khuzestan	Treated	93.9	86.6	23	82.9
	Control	4.3	—0—	+16.6	7.4
Isfahan	Treated	90	—	50	83.3
	Control	7.1	—	—0—	—0—
Both Areas	Treated	92	86.6	31.5	83
	Control	5.5	—0—	+14.2	4.8

Table 2
Mean number of egg/gr. of faeces of various helminths before and after treatment by Oxantel pyrantel and percentage of egg reduction in remaining positive and control cases. (1976)

			Ascaris	Hookworm	Trichostrongylus spp.	Trichuris
Khuzestan	Treated cases	Before treatment	8,435	617	150	222
		After treatment	150	100	75	342
		% egg reduction	98.2	83.7	50	+54
	Control cases	Before treatment	6,883	548	168	252
		After treatment	6,325	691	107	182
		% egg reduction	8.1	+26	36.3	27.7
Isfahan	Treated cases	Before treatment	52,692		591	592
		After treatment	13,600		150	150
		% egg reduction	74.1		74.6	74.6
	Control cases	Before treatment	42,075		350	589
		After treatment	52,590		450	586
		% egg reduction	+24.9		+28.5	0.5