Cure rates and egg reduction in treatment of intestinal schistosomiasis with oxamniquine and praziquantel in Maniema, Zaire

A. M. Polderman, B. Gryseels[1] and P. De Caluwe[2] *[1]Laboratory for Parasitology, State University of Leiden, P.O. Box 9605, 2300 RC, Leiden; [2]Société Minière et Industrielle du Kivu, Kalima, Zaire*

Introduction

GRYSEELS *et al.* (1987) reported the cure rates and egg reduction rates following treatment of *Schistosoma mansoni* infection with different doses of oxamniquine and praziquantel in Burundi. The side effects of praziquantel were less, the costs lower and the administration easier than those of oxamniquine. Although the therapeutic effect of praziquantel was slightly less than that of oxamniquine, praziquantel was considered the drug of choice. In children, the cure rate and particularly the egg reduction rate of praziquantel at 30 mg/kg were somewhat inferior to those of the standard dose of 40 mg/kg; the latter dose was recommended for further use.

Independently, but using the same methods resulting from extensive collaboration in other fields, a similar comparison of the efficacy of praziquantel and oxamniquine has been made in some villages with high prevalences and intensities of infection in Maniema, Zaire. The remarks of GRYSEELS *et al.* (1987) on the ease of use and the lower cost of praziquantel are true for Maniema too. The side effects of oxamniquine were similar to those observed in Burundi, but those following praziquantel treatment were more intense (POLDERMAN *et al.*, 1984). Yet praziquantel is well accepted by the population and preferred to oxamniquine. The cure rates in Maniema differed significantly from those reported by GRYSEELS *et al.* (1987).

Patients and Methods

Patients in 4 villages were treated with either oxamniquine (15 or 40 mg/kg body weight) or praziquantel (30 or 40 mg/kg). At first, two doses of oxamniquine were compared. Later praziquantel was added and, on a small scale, praziquantel at a lower dose was also used. In one village, all regimens were used simultaneously. In order to facilitate observation of the side effects of the drugs, placebo treatments (followed by real treatments) were included in the protocol at the beginning of the study. The prevalence (>90%) and intensity of infection were very high in each of the villages (POLDERMAN *et al.*, 1984, 1985). The intensity of infection was assessed using duplicate 25 mg Kato smears; the cure rate and egg reduction were determined 6 weeks after treatment. Repeated later examinations were made but were greatly influenced by reinfection. More details of methods and the project area have been given elsewhere (POLDERMAN *et al.*, 1985).

The presentation and interpretation of results is slightly different from the method followed by GRYSEELS *et al.* (1987). The cure rate is determined as the percentage of treated subjects excreting eggs before treatment but in whom no eggs were found when re-examined after 6 weeks. The egg reduction in those who were not cured is expressed as the group's geometric mean egg output after treatment divided by the geometric mean egg output of the same individuals before treatment, multiplied by 100 ("percentage of eggs remaining"). Finally, the percentages of subjects excreting more than 100 and more than 600 eggs per gram (epg) of faeces before treatment, and 6 weeks after treatment, were compared.

Results and Discussion

The results are shown in the Table, which shows that a considerable proportion of treated people continued to excrete eggs 6 weeks after treatment. The cure rates were lower in children than in adults, for both oxamniquine and praziquantel. The results in the placebo-treated group indicate that the reproducibility of egg counts was adequate.

The cure rates found in this study were considerably lower than those found in most other studies. There are 3 possible explanations for this.

(1) The eggs exccreted might be dead, difficult to differentiate from live ones in the Kato smears. This did not appear to be a valid explanation. The viability of eggs obtained after washing 35 positive stool specimen and sedimentation in glycerinated water was determined by examination of the movements of flame cells and cilia; live eggs were found in 32 specimens. In only 3 specimens was a single dead egg, and no live one, found.

(2) Since transmission was intense in the area, at least some of the eggs recovered may have resulted from infections acquired just before treatment: schistosomulae migrating at the time of treatment may have evaded the effect of the drug.

(3) The last, and perhaps most likely, factor which may have been responsible for the low cure rate, is the comparatively high egg output and worm load before treatment. The reduction in egg output among those who were not cured was considerable, even in those who received the lower dose of oxamniquine.

However, the lower dose of oxamniquine seemed inadequate both in children and in adults. The lower dose of praziquantel was almost as effective as the standard dose of 40 mg/kg but the numbers of patients treated with the lower dose were too small to allow firm conclusions. Although GRYSEELS *et al.* (1987) indicated a slightly higher cure rate and egg reduction with the praziquantel 40 mg/kg regimen,

Table—Comparison of the cure rates and egg reduction following treatment of schistosomiasis mansoni with praziquantel and oxamniquine

Regimen	Age group (years)	No. treated	Cure rate (%)	Eggs remaining (%)	Percentage excreting > 100 epg before treatment	Percentage excreting > 100 epg after treatment	Percentage excreting > 600 epg before treatment	Percentage excreting > 600 epg after treatment
Praziquantel 40 mg/kg								
	6-20	70	47	10	86	16	55	3
	> 20	95	69	8				
Praziquantel 30 mg/kg								
	6-20	22	50	16	88	14	67	6
	> 20	20	85	27				
Oxamniquine 40 mg/kg								
	6-20	120	43	6	85	8	43	1
	> 20	177	70	9				
Oxamniquine 15 mg/kg								
	6-20	169	21	13	88	30	47	8
	> 20	205	40	13				
Placebo								
	6-20	83	66	112	86	80	44	45
	> 20	119	5	113				

compared to 30 mg/kg, their results, too, showed only fairly small differences.

The observations of GRYSEELS *et al.* (1987), in combination with ours, seem to justify the use of a more liberal weight-related dose schedule of 30-40 mg of praziquantel per kg bodyweight in control projects in central Africa. Using standard 600 mg tablets, the following simplified regimen could be used: less than 20 kg, 1 tablet; 21-30 kg, 1½ tablets; 31-40 kg, 2 tablets; 41-60 kg, 3 tablets; over 60 kg, 4 tablets. Depending on the characteristics of a specific area, such a regimen could be translated into an age-dependent schedule.

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