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Treatment of ankylostomiasis with levamisole

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Summary

The authors communicate their experience in the treatment of ankylostomiase with levamisole; with a dose of 2·5 mg/kg body weight they achieved a positive result in two-thirds of the cases in a series of 119 without any toxic side effects.

Résumé

Les auteurs communiquent leur expérience avec tetramisole dans le traitement de l'ankylostomiase. En donnant 2·5 mg/kg, une ou deux fois avec 4 jours d'intervalle ils obtiennent une négativation des selles dans 64 et 69% des cas sans aucun effet secondaire.

Introduction

In many tropical regions ankylostomiasis is and as yet remains a particularly obnoxious infestation because of its more or less anaemizing action. Indeed whereas a well-fed adult usually will only suffer slightly from such an intestinal parasitosis it is often the idiomatic 'last straw to break the camel's back' in a chronically underfed population and as such the cause of severe anaemia.

In addition to a symptomatic treatment of supplying iron and eventually a blood transfusion we nowadays have mainly three active products: tetrachlorethylene, bephenium hydroxynaphtoate and levamisole. We can add thiabendazole although this product should rather be regarded as a broad spectrum anthelminthic with restricted action against ankylostomiasis. To be able to compare the activity of the first three products mentioned with one another we started a prospective study 3 years ago on all hospitalized cases where ankylostomae were found in routine faeces examination (Huys, Kayihigi & Freyens, 1973). The classification into the different schemes of treatment was completely coincidental by the drawing of lots. We now present the results obtained in the group treated with levamisole.

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Method and material

With regard to the composition, the therapeutic action and the metabolism of levamisole we refer the reader to former publications (Thienpont *et al.*, 1966; Vandgenbosche & Janssen, 1967, 1969; Gatti *et al.*, 1969; Lucas & Oduntan, 1972; Farid *et al.*, 1973). Indeed according to different authors the results with levamisole in the treatment of ankylostomiasis varied between 20% and more than 90%. We can only add that in this study two different schemes of treatment were followed: the first group received 2·5 mg levamisole per kg body weight in the morning on an empty stomach without a purgative, the second group received the same dose twice with an interval of 4 days. The check on worm eggs was carried out on 2 successive days after 1 or 2 weeks. The average time between the treatment and the control was 10·2 days with extremes values of 7 and 14 days. It was initially planned to repeat the control after 4–6 weeks but only a small percentage of the patients were still hospitalized at that moment and the other ones usually did not come back for check-up.

Diagnosis was always founded on a direct faecal examination mostly confirmed by means of a semi-quantitative method as proposed by a W.H.O. committee (1964). It is of course not possible to establish the species in this way but by means of

TABLE 1. Summary of the patient material

		Total	Number of cases semi-quantitative examined	Average number of worm eggs per 2 mg	Number of cases with two genera of worm eggs: *Ankylostoma* + *Ascaris*
Group 1	Men	53	42	3·02	24 = 45·2%
2·5 mg/kg	Women	21	18	3·00	13 = 61·9%
Group 2	Men	32	28	6·89	
2·5 mg/kg			26*	3·26	17 = 53·1%
× 2	Women	13	11	2·73	6 = 46·1%

* Calculation without taking the two exceptional cases into account.

TABLE 2. Results according to the groups and to the sex

Group 1	Men	19/53 = 35·8% failures	27/74 = 36·4% failures
	Women	8/21 = 38·0% failures	
Group 2	Men	10/32 = 31·2% failures	14/45 = 31·1% failures
	Women	4/13 = 30·7% failures	
All men together		29/35 = 34·1% failures	
All women together		12/34 = 35·2% failures	

By failure we mean each case in which the post-treatment examination of the faeces still showed the presence of *Ancylostoma* eggs.

numerous test samples taken when autopsies were performed only *Ankylostoma duodenale* was found every time (Vanderick, personal communication). We may therefore assume with considerable certainty that this species is present, if not exclusively then certainly predominantly.

One hundred and nineteen cases were treated in this way, seventy-four of which were in the first group (fifty-three men and twenty-one women) and forty-five in the second (thirty-two men and thirteen women). The difference in numbers is especially due to the fact that by necessity the second group had to be hospitalized for a longer period before the check of the faeces could be carried out and this was not always acceptable to the patient.

The first table summarizes the average number of worm eggs in the faeces of each group, further subdivided according to sex, before treatment. If we do not take the two exceptions into account in the two groups of men (one case with eighty-nine and another with nineteen worm eggs per 2 mg faeces) then it appears that the averages in each series are completely comparable statistically. In the same table we have also noted the number of cases where eggs of *Ascaris lumbricoides* as well as those of *Ankylostoma* were found in the faeces, in other words about half the cases are doubly infected.

Results

In Table 2 we have summarized the results in both groups and at the same time classified them according to sex; from this we can see that in 64% the faeces were cleared of *Ankylostoma* with a single dose of levamisole and in 69% with two doses. The slight difference is however not statistically significant.

In Table 3 we have classified the results according to whether only *Ankylostoma* were found in the faeces or whether *Ankylostoma* and *Ascaris* and possibly a third or fourth genus were found. This table shows us that the results are less favourable as soon as there is a combined infection. The same remark goes also for the efficacy of the drug in the treatment of the ascaridiosis; indeed in this limited series we obtained a positive result in

TABLE 3. Results according to the presence or absence of *Ascaris* eggs in the faeces

	Only *Ancylostoma*			*Ancylostoma*+ *Ascaris*		
	Number	Therapeutic failure		Number	Therapeutic failure	
Group 1						
Men	29	9		24	10	
			29·7%			41·0%
Women	8	2		13	6	
Group 2						
Men	15	4		17	6	
			27·2%			34·7%
Women	7	2		6	2	
Total	59	17=28·8%		60	24=40%	

only 80% (48/60) where normally we obtain an almost 100% result (Huys *et al.*, 1973).

Concerning side effects we can only confirm what has been known for a long time *viz.* that levamisole is completely atoxic in such doses.

Conclusion

Levamisole can therefore be used with relatively favourable results in the treatment of ankylostomiasis; indeed in two-thirds of the cases treated we obtained a negativation of the faeces in two successive controls. Administering a double dose on the other hand has little practical value as the results are not significantly improved: the price of the treatment, however, is doubled which is always a limiting factor for large-scale treatments in developing countries.

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