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THE EFFECT OF NICLOSAMIDE IN EXPERIMENTAL TRICHINELLOSIS OF MICE

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Abstract. Niclosamide was tested against trichinellosis as a single dose of 200 mg/kg on the 3rd, 7th, 10th, 12th, 15th or 22nd day after experimental infection of mice. Relatively good results were obtained in the early intestinal stage of nematode development, i.e. on the 3rd day. No better results than those obtained after a single dose on the above mentioned days were obtained after repeated dosage between the 8th—14th and 15th—19th day respectively.

The effectiveness of niclosamide as a substance against cestodes of man and animals has been discovered in model experiments on rats by GÖNNERT and SCHRAUFSTÄTTER (1960). As there was some indication that the drug might be effective also against some nematodes, we considered the possibility of using this well tolerated compound experimentally in the control of trichinellosis. As far as we know the effect of this anthelmintic on these worms has not yet been examined.

MATERIALS AND METHODS

Niclosamide was administered in the form of Bayer's Yomesan at a dose-rate of 200 mg/kg. In these experiments male white mice weighing 21—23 g were used. The mice were infected with 250 ± 15 larvae of *Trichinella spiralis* dispersed in an agar suspension which was given to the mice by a stomach tube.

The drug was given as a single dose on the 3rd, 7th, 10th, 12th, 15th or 22nd day following the experimental infection in order to establish its effect on the various developmental stages of *Trichinella*. In addition the same dose of niclosamide was given daily between the 8th—14th day and the 15th—19th day respectively to two groups of mice. The results were evaluated by comparing larval counts in the 8 treated groups with those in the one control group in which the mice had not been treated. Each group consisted of 15 animals. All animals were killed on the 40th day after inoculation.

For isolating the larvae the mice were skinned and left to digest (subgroups of 3 animals at the time) in artificial gastric juice containing 1% pepsin and 1% HCl. The activity of pepsin was 10,000 units. Digestion was completed in 4 hours at 38 °C with constant stirring. The isolated larvae were then placed in an agar suspension and well shaken. Larval counts were made on 1 ml of suspension and multiplied by the number of ml in the whole amount of agar. This method is described in detail in a previous work (ŠPALDONOVÁ et al. 1965).

Before starting our experiments on *Trichinella* infected mice we examined the tolerance of niclosamide in 8 uninfected mice evaluating changes in the blood picture and weight after a dose of 200 mg/kg administered daily for 7 days.

At the end of this experiment repeated examinations failed to show any changes in the blood picture. By giving a single 10 times higher dose (i.e. 2,000 mg/kg) we found also this dose to be well tolerated by the mice.

RESULTS

The experiments (Table 1) indicate that niclosamide has some effect on experimental trichinellosis in mice. These experiments show that the tested compound effects most the early stage of development, i.e. on the 3rd day after invasion. Administered on the 7th day the effect is lower and lower still on the 10th day. Again, a better

Table 1. Mean larval counts in one mouse after a single dose of 200 mg/kg niclosamide on the various stages of experimental trichinellosis in comparison with the control group

Subgroups (3 mice)	Days after infection						Control subgroups (3 mice)
	3	7	10	12	15	22	
1	15,440	26,820	32,200	22,300	32,170	35,630	52,840
2	22,420	21,600	43,030	33,210	38,530	30,260	42,650
3	11,830	32,840	36,260	29,430	29,410	42,340	55,320
4	24,170	27,210	33,960	32,620	22,330	49,610	50,040
5	14,310	14,580	45,800	26,690	29,810	38,860	61,440
$\bar{x}$	17,634	24,610	38,250	30,850	30,450	39,340	52,458
s	±2,339	+3,074	±2,634	⊥2,939	±2,604	±3,247	±3,090
% effect.	66.4	53.1	27.0	41.0	42.0	25.0	100

effect is found on the 12th and 15th day, while on the 22nd day niclosamide is little effective.

Repeated administration of niclosamide (200 mg/kg) between the 8th—14th and 15th—19th day respectively showed no better results than the single dose given during these stages.

DISCUSSION

When evaluating our results and comparing them with other substances used against *Trichinella* we found that, in experimentally infected mice, niclosamide is about as effective as piperazine adipate.

An interesting fact is the high resistance of *Trichinella* against drugs on the 10th day after infection. This was observed by Schoop and Lamina (1962) and Lamina (1962) using trichlorphon and confirmed by our results with thiabendazole (Špaldonová et al. 1965). Since this problem has not yet been answered, it needs to be further investigated.

In conclusion it may be said that among the substances used in experimental trichinellosis of mice, niclosamide is less effective than thiabendazole and trichlorphon. In comparison with trichlorphon it is more suitable because of its wider therapeutic index.

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ANNUAL MEETING OF THE FRENCH PARASITOLOGICAL SOCIETY IN ANGERS

The annual meeting of the French Parasitological Society was held in Angers from April 8th to 10th, 1969. The Meeting was organized by Dr. P. Hocquet, professor of Parasitology of the Medical Faculty in Angers. The participants, about 70 delegates, presented 25 papers and professor Doby projected his film on parasitological field expeditions of his institute. Thirteen of the papers were concerned with helminthology, 6 with protozoology, one with entomology and 5 with subjects of a more general character.

Of the prominent French parasitologists participating in the Meeting these were the professors: Bailanger (Bordeaux), Cavier (Paris), Combescot (Perpignan), Doby (Rennes), Galliard (Paris), Hocquet (Angers), Chabaud (Paris), Kerjean (Angers), Rangue (Marseille), Rioux (Montpellier), Vermeuil (Nantes) etc. Czechoslovakia was represented by professor Jírovec, who was chairman of the afternoon session on April 8 and read a report on amoebas of the group Limax, the agent of fatal meningoencephalites in man, discovered by Dr. L. Červa. The report was received with great attention in view of the novelty of this disease and of its etiology. The annual meeting finished on the 10th with an excursion to the Abbey of Fontevault and to the atomic power plant at Aveine-Chinon.

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