THE EFFECT OF DL-TETRAMISOLE* ON THELAZIA RHODESI (EYE-WORM) IN CATTLE

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SUMMARY

Dl-tetramisole* at a dose rate of 15 mg./kg, produced rapid clinical recovery in 10 cattle naturally infected with *T. rhodesii* and showing extensive keratoconjunctivitis.

The drug concentration in tears was measured at periods from ½ an hour to 4 hours following the administration of a standard dose and was found to be higher than that required to produce an irreversible and lethal effect on both invasive larvae and adult worms *in vitro*.

INTRODUCTION

Thienpont, Vanparijs et al. (1966) reported on tetramisole*, a new anthelmintic with a wide range of activity against nematodes and low toxicity to the host. We have tested it against a further parasitic nematode—*Thelazia rhodesii* (Desmarest, 1827) a common cause of verminous keratoconjunctivitis in cattle in Europe, Asia, Africa and America.

We have observed the effect of various concentrations of tetramisole* on this parasite *in vitro* and have determined the concentration of the drug in cattle tears following the administration of 15 mg/kg *per os*. We have also undertaken a clinical trial of the drug in naturally infected cattle.

MATERIAL AND METHODS

(a) *In vitro Experiments.*—These were carried out using infective larvae and adult worms recovered by dissecting bovine eyes by Tretjakovova’s method (1965). These worms were maintained in a solution comprising 3·4 ml of fresh egg-yolk and 6·6 ml of phosphate-buffered physiological saline† at a pH of 7·2–7·5 and a temperature of 28°C.

(b) Concentration of dl-tetramisole in Tears.—Fifteen mg/kg of dl-tetramisole were given *per os* in an aqueous solution to 2 young cattle. Samples of ½ to 1 ml of tears were collected from each animal 30 minutes, 1, 2 and 4 hours respectively after the administration of the drug and assayed for dl-tetramisole by the polarographic method described by Holbrook and Scales (1967).

(c) Clinical Experiments.—The drug was tested in a natural outbreak of parasitic...
keratoconjunctivitis, which did not respond to local antibiotic treatment. Clinical examination revealed inflammatory changes of varying intensity in 15 animals. In the initial stages of the disease there was mild swelling of the eye-lids, conjunctivitis and excessive lacrimation. The discharge was clear and watery at first, becoming thicker and mucous in character as the disease progressed. The conjunctiva became dirty-red in colour, with strongly injected blood vessels and a severe catarrhal inflammation. In some cases there were petechial haemorrhages in the conjunctiva. The eyelids were severely swollen and the mucopurulent discharge dried around the eyes preventing some animals from opening the lids. In 5 cases inflammation spread to the cornea, producing a diffuse greyish-yellow film. In 2 animals an ulcer the size of a maize seed developed at the centre of the cornea. Affected animals showed pronounced photophobia and resisted examination. Marked inappetance and loss of weight and condition occurred. *T. rhodesii* was found in the conjunctival sac of all affected individuals.

The affected animals were housed in a darkened stable and divided into 3 groups, the first being given 15 mg of tetramisole/kg *per os* while the second group received the same dose twice with an interval of 24 hours. The third group was left untreated as a control.

**RESULTS**

(a) *In vitro Experiments.*—Previous work (Corba, 1968) has shown that the mean survival time of invasive larvae in the medium used is 102 hours and that of adults 109.3 hours. Table I shows the average time taken for spontaneous movement of *T. rhodesii* to cease following immersion in different concentrations of tetramisole in it.

The effect of the drug was irreversible—i.e., no spontaneous movement started after the worms had been transferred back into unmedicated media. It will be seen

<table>
<thead>
<tr>
<th>Concentration of tetramisole in µg/ml</th>
<th>200</th>
<th>100</th>
<th>50</th>
<th>10</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invasive larvae</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Lethal Time in minutes</td>
<td>8</td>
<td>17</td>
<td>30</td>
<td>135</td>
<td>240</td>
<td>480</td>
</tr>
<tr>
<td>Adult worms</td>
<td>9</td>
<td>30</td>
<td>60</td>
<td>120</td>
<td>240</td>
<td>480</td>
</tr>
</tbody>
</table>

from this Table that the infective larvae, said to be the primary cause of the clinical signs of thelaziasis (Krastin, 1957; Hovorka, 1959) are more susceptible than adult worms to tetramisole.

(b) Table II shows tetramisole levels in the tears of cattle at varying intervals after the administration of 15 mg/kg. Earlier work in cattle, sheep, pigs and goats (Scales, unpublished) has shown that following an oral dose of 10 mg/kg peak blood levels ranging from 0.5 to 1.5 µg/ml are obtained between ½ and 2 hours after dosing. Evidently the drug level is considerably higher in tears than in blood.

(c) *Clinical Experiments.*—In the first group the clinical condition of the animals began to improve on the second day following treatment. Eye discharge was greatly reduced and the colour of the conjunctiva returned to normal. On the third or fourth day appetite was completely restored and on the seventh day all clinical signs of thelaziasis had disappeared.