Therapy with avermectines and diazinon of psoroptic mange in sheep from Transylvania, Romania

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Abstract. In a study of three acaricides, doramectin (Dectomax®, Pfizer) used at a single dose of 300 μg/kg b.w. given intramuscularly showed a high efficacy (95%) against Psoroptes ovis, in naturally infected sheep. All doramectin treated animals were clinically normal and all skin scrapings were negative for mites 50 days after treatment. At the end of experiment (70 days) only 5% of the animals showed skin lesions and a low infestation score (1+), compared to 10% for ivermectin (Romavermectine®, Romvac Company S.A. Bucharest) and 20% for diazinon (Scabizol®, Romvac Company S.A. Bucharest). The three treatment groups were continually in contact with infested sheep during the study.

Keywords: Psoroptes ovis; Ivermectin; Doramectin; Diazinon.

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Introduction

Psoroptic mange is one of the most important parasitic diseases of sheep in Romania (Şuteu and Cozma, 2004). Moreover, Psoroptes and sheep scabies appears to be common throughout all Europe (Colebrook and Wall, 2004).

In Romania, control is achieved mainly by a dipping program consisting of two treatments given in the spring and autumn. Organophosphates (diazinon) and pyrethroids (deltamethrin) are the most frequently used drugs. In Great Britain, for the treatment of scabies outbreaks, macrocyclic lactones (largely doramectin) were used on 58% of sheep farms (Bisdorff and Wall, 2008).

Over the past 20 years, ivermectin given twice at 7 days interval (Campbell, 1985; Şuteu, 1995) has been used as treatment for outbreaks of psoroptic mange in sheep. In recent years, doramectin (Dectomax) has also been used at a dosage of 0.2 mg/kg b.w., repeated after 7 days (Şuteu and Cozma, 2004). This latter drug has also been used successfully as a single injection at 300 μg/kg b.w. (Bates et al., 1995).
This is a report of a comparative study of the efficacy of Romavermectin (ivermectin), Scabizol 30% (diazinon) (Romvac Company S.A. Bucharest, Romania) and Dectomax (doramectin, Pfizer) in *P. ovis* infected sheep in Transylvania.

**Materials and methods**

The work was carried out between March and May 2008 in Cluj region (Transylvania, Romania) during an outbreak of psoroptic mange in sheep. Eighty adult and young animals were distributed into 4 groups:

- group 1 (20 sheep) was treated with ivermectin (Romavermectin®, Romvac Company S.A. Bucharest) at a dose of 0.2 mg/kg b.w., twice at 7 day interval;

- group 2 (20 sheep) received doramectin (Dectomax®, Pfizer), given i.m. at a single dose of 0.3 mg/kg b.w.;

- group 3 (20 sheep) was dipped with diazinon (Scabizol®, Romvac Company S.A. Bucharest), diluted at 0.85%. Dipping was repeated 7 days later;

- group 4 (20 sheep) used as a control group.

Treated animals were permanently in contact with untreated ones.

During the observation period (70 days), clinical and parasitological examinations were performed on 5 animals randomly selected from each group on days 0, 7, 20, 30, 50 and 70 after treatment. At each visit the percentage of animals with typical psoroptic mange lesions was established.

Skin scrapings were collected from 5 sheep in each group. All mites present in a sample were counted and identified as to species and stage. Eggs were also counted. An infestation score was established according to the criteria described in table 1.

**Results and discussion**

At the beginning of the study, all sheep (n=80) showed clinical signs of psoroptic mange, with wool loss on different parts of the body, pruritus, scratching, exudative and crusty dermatitis. Evaluation of efficacy was made according to two criteria: clinical improvement (absence or regression of lesions) and parasitological data (absence of living mites and eggs).

**Table 1. Parasitological score in *P. ovis* infected sheep**

<table>
<thead>
<tr>
<th>Score</th>
<th>Mites</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>not seen</td>
</tr>
<tr>
<td>1+</td>
<td>1-9 mites, eggs</td>
</tr>
<tr>
<td>2+</td>
<td>10-49 mites, eggs</td>
</tr>
<tr>
<td>3+</td>
<td>&gt;50 mites, eggs</td>
</tr>
</tbody>
</table>

Microscopic examination performed on skin scrapings from five randomly selected animals per group, revealed infestation with *Psoroptes ovis* (10-49 mites or eggs/field) in all 4 groups (table 2). Clinical examination performed on day 7 revealed the absence of pruritus and scratching in sheep from the three treated groups. Scabs were absent in 30%, 50% and 20% of the sheep in group 1, 2 and 3 respectively.

Additionally, mite counts performed on the same day revealed the presence of 1 to 9 mites or eggs per field. On day 20 there was a marked clinical improvement in the three treated groups and the wool was re-growing. Skin scrapings were negative for mites.

Clinical and parasitological examinations performed on days 30 and 50 were negative, except in the diazinon dipped group in which 2 sheep (10%) began to scratch themselves on day 50. *Psoroptes ovis* were observed in skin samples from clinically positive sheep.

On day 70 in all three treated groups re-infestations were observed. Ten percent of animals in the ivermectin treated group showed lesions of exudative dermatitis with pruritus and scratching and low *Psoroptes spp.* infestation (1+).
Table 2. Efficacy of ivermectin, doramectin and diazinon in *P. ovis* naturally infected sheep – Cluj region, Romania

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>( n )</th>
<th>Examination</th>
<th>Day</th>
<th>( 0 )</th>
<th>7</th>
<th>20</th>
<th>30</th>
<th>50</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ivermectin</td>
<td>20</td>
<td>Clinical lesions (%)</td>
<td>100</td>
<td>70</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive (score)</td>
<td>2+</td>
<td>1+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1+</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Doramectin</td>
<td>20</td>
<td>Clinical lesions (%)</td>
<td>100</td>
<td>50</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive (score)</td>
<td>2+</td>
<td>1+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Diazinon</td>
<td>20</td>
<td>Clinical lesions (%)</td>
<td>100</td>
<td>80</td>
<td>40</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive (score)</td>
<td>2+</td>
<td>1+</td>
<td>0</td>
<td>0</td>
<td>1+</td>
<td>1+</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Control</td>
<td>20</td>
<td>Clinical lesions (%)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive (score)</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td></td>
</tr>
</tbody>
</table>

Only 1 animal (5%) from the doramectin single dose treated group was positive for mites (1+) and showed pruritus.

Twenty percent from the animals of group 3, dipped in diazinon, showed signs of psoroptic mange (pruritus and exudative dermatitis) and had a positive parasitological examination (1+).

Untreated animals remained clinically and parasitological positive throughout the trial (100% and 2+).

As the sheep from the three treatment groups were in contact at all times with infested sheep it was impossible to tell when they became re-infested, however the results of this study demonstrated that re-infection occurs if treated animals are not strictly isolated from untreated counterparts or infected premises.

The result of this study is in agreement with these obtained by Bates et al. (1995) using a single dose of doramectin at 0.3 mg/kg. This study also indicate that re-infection is the rule if treated animals are not strictly isolated from untreated counterparts or infected premises, observation mentioned also by Milne et al. (2007) in Scottish sheep flocks.

References


