A STUDY ON THE EFFICACY AND SAFETY OF IVERMECTIN AGAINST SARCOPTIC MANGE IN RABBIT BUCKS AND ITS EFFECT ON SEMEN QUALITY

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The study was done on 28 male white New Zealand rabbits classified into four groups each of seven rabbits. The first group was naturally infested with Sarcoptic mange caused by Sarcoptes scabiei. This group was given ivermectin subcutaneously at 200 Ug/Kg b.w. twice weekly with one week interval. The second group included naturally infested rabbit housed with clinically mite free rabbit treated with Ivermec (200 Ug/Kg b.w. onetime 5%.) as a prophylactic dose. The third group included infested rabbit housed with clinically non-infested rabbit without any previous treatment and the fourth group included rabbits infested with Sarcoptes mite and treated with double dose 400 Ug/Kg b.w. twice with one week intervals. No clinical symptoms of toxicity have been recorded at any stage of experiment. Also reinfection of treated animals have not been recorded up to 60 days of observation. The study proved that ivermect protected healthy rabbit from getting infection by direct contact with infected animals. Also we found that the dose higher than therapeutic (200 Ug/Kg b.w.) didn't accelerate the recovery but had mony drawback on fertility. Semen was collected and evaluation was carried on where significant alteration have been recorded and was correlated with the injected dose of ivermectin.

INTRODUCTION

Rabbit production is a very important industry covering some shortage of animal protein for human consumption and has a very important economic value. However, rabbit production is threatened by several diseases due to viral, bacterial or parasitic causes. The most important parasitic diseases are coccidiosis (internal parasite) and mange as external parasite. The advent of broad spectrum anthelminthic treatment such as ivermectin (Ivermec) offer the potential of improving production efficiency through control of internal and external parasites. Avemectins (AVM) are a new family of insecticidal, acaricidal and anthelmintic agents that have been isolated from fermented products of Streptomyces avermitilis (Ottlind et al., 1979).

Keppman et al., (1989) recommended treatment with ivermectin once every 6 months to suppress Sarcoptic mange on rabbit farms. Similarly, Ferrero et al., (1994) found that treatment of adult rabbit naturally infested with Sarcoptes caniculi with a single dose of 200 Ug/Kg resulted in cure (95.45 %) within 14 days and the rest of animals required a second treatment.

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Papparella and Cringoli, (1993) observed that 200 Ug/kg ivermectin given twice at a 7-day interval was completely effective against Sarcoptic and Sarcoptic mange in rabbit while a single treatment with 200 Ug/kg didn’t totally eliminate Sarcoptes. Several other studies dealt with the efficacy of ivermectin in rabbit e.g. (Ali, 1990; Sirvastava et al., 1991; Rao et al., 1992; Tripathi et al., 1993; Akinlade et al., 1994 and Yeatts, 1994).

The aim of this study was directed to study the efficacy of ivermectin against mange in rabbit. Moreover, possibility of using prophylactic dose of ivermectin protecting healthy animals from getting infestation during outbreak. Investigating the side effect of ivermectin with special consideration to its effect on male reproductive efficacy was also carried out.

Material and Methods

A. Drug used: Ivermectin (1% ivermectin) produced by Merck Sharp & Dohme (MSD AGVET, U.S.A) and given subcutaneously at double doses with one week intervals in treated animals.

B. Animals, grouping and dosing: The present study was carried out 28 male white New Zealand rabbits aged (9-12) months with an average body weight of 4.0 kg classified into four groups each of seven rabbits as follows:

1. The first group (Group I): included seven naturally infected animals with Sarcoptic mange (Sarcoptes scabiei). This group was given ivermectin at 200 Ug/kg b.w.t. (S/C) twice with one week interval and used for evaluation the efficacy of ivermectin against Sarcoptic mange.

2. The second group (Group II): consists of three naturally infected non-treated rabbits (subgroup A) housed with four clinically non-infected animals treated with ivermectin (200 Ug/kg b.w.t. S/C) twice with one week interval (subgroup B) and used for evaluation the prophylactic potency of ivermectin.

3. The third group (Group III): included three naturally infected non-treated rabbits (subgroup A) housed with four clinically non-infected animals without ivermectine treatment (subgroup B) and used as a control for the second group.

4. The fourth group (Group IV): included seven rabbits naturally infected with Sarcoptic mite and treated with double therapeutic dose (400 Ug/kg b.w.t. S/C twice with one week interval and used for evaluation the possible toxic effect of ivermectin on treated rabbits.

All rabbits were subjected for daily observations and offered feed and water. Daily observation were carried out for detection of any clinical symptoms or signs of toxicity and for detection the possibility of reinfection after clinical recovery.

Parasitic Examination:
Each rabbit was subjected for clinical and microscopic examination for mange infestation. Skin scraping were taken from affected animals for microscopic examination after preparation in KOH 10% solution where the type of mite were identified according to Soulsby (1982).

Haematological investigations and semen evaluation:
Blood and semen samples were collected after one week from last injection from all infested ivermect treated animals at various doses (from first group given 200 Ug/kg b.w.t and fourth group given 400 Ug/kg b.w.t) beside a control infested non-treated group (second and third groups). Haematological studies were carried out according to Sebaim (1986) and semen samples were collected from treated animals by artificial vagina and semen evaluation was carried out after Zemjanis (1962).

Statistical analysis was adopted after Snedecor and Cochran (1973).

RESULTS & DISCUSSIONS
Mange is a highly contagious and debilitating skin disease. It represents together with coccidia the most important parasitic diseases affecting rabbit production. Ivermectin has an impressive spectrum of activity against endo and ectoparasites (Campbell et al., 1983).

In our study, the most prevalent clinical manifestation in mite infested rabbit were itching, erythma, scaling and erusting dermatitis. The ears, face and hing legs were the worst affected areas. Animals of first group infested with Sarcoptes and treated with ivermectin (200 Ug/kg b.w.t) twice with one week interval showed signs of clinical recovery within three days of first injection and complete recovery and healing of the lesions was achieved after days of first injection. Similar results were recorded by Ferro, et al., (1994); Papparella and Cringoli, (1993) while Ramesh et al., (1990) found that this dose was insufficient for mite elimination. Also Tripathi et al., (1993) recommended a higher dose (400 Ug/kg b.w.t) given at a single S/C dose.

Animals of fourth group given double therapeutic dose (400 Ug/kg b.w.t) twice with one week interval showed clinical recovery within the same period as the previous group (3-10) days from first infection, however slight haematological changes and reduced semen quality has noticed (table 1&2).

Concerning the haematological studies table (1) shows that ivermectin improved the blood picture of mite infested animals, however this improvement was more pronounced when used at its therapeutic dose (200 Ug/kg b.w.t). In this aspect our data coincided with Shalhmanni et al., (1994). However Ramesh et al., (1989) found that sheep injected with up to 25 times therapeutic dose of ivermectin showed no important changes in blood count.

Table (2) shows the semen quality of rabbit either naturally infested or after treatment with different doses of ivermectin. It is quiet clear that ivermectine treatment disturbed semen quality at both doses under investigation. Higher doses (400 Ug/kg b.w.t) had more drastic effect on percentages of progressive motility, live sperm, total sperm abnormalities together with reduction in sperm cell concentrations.
In contrast to our study, Schroeder et al., 1986 recorded that semen picture in Merino ram was similar before the first and after last Ivomec treatment. This variation may be due to species variation. Anyhow our results are in complete agreement with the study of Mervat Ghaniem and Mansour, (1992). They concluded that alteration in semen picture in rabbit after Ivomec treatment coincided with testicular lesions recorded in their study.

Also we noticed that the prophylactic dose of ivermectin protected healthy rabbit from getting infestation from infected animals in contact (second group) while non-treated animals developed clinical symptoms of infestation within three weeks of direct contact with infected animals (Gp III). We coincided with Tripathi et al., (1993) who found that Ivomec treated animals didn't encounter experimental infestation with P. Cuniculi while untreated control showed development of lesions.

In a conclusions we can advise the use of Ivomec for prophylactic purposes or as an emergency treatment for parasitic infection and during outbreaks of mange in rabbit buck's used for meat production and not for breeding because of its interference with the fertility as recorded in this study table (2) and keep in mind a suitable time for withdrawal from edible tissue as suggested previously by Ferrero et al., (1994). Also from the present work we concluded that Ivomec is a very effective drug for control of mange in rabbit and should used within the dose of (200 Ug/kg b.wt.) twice and over doses didn't accelerate the clinical recovery but have different drawback on animal health and fertility.

Table (1): Blood picture of male Newzeland rabbit naturally infested with Sarcoptic mite (Non treated or treated with Ivomec at different dose level.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Dose</th>
<th>R.b Cs</th>
<th>W.b Cs</th>
<th>Hb gm%</th>
<th>P.C V%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>200 Ug/kg b.wt</td>
<td>6.1 ± 0.72*</td>
<td>6.5 ± 0.71**</td>
<td>13.8 ± 1.5**</td>
<td>37 ± 2.7**</td>
</tr>
<tr>
<td>Group IV</td>
<td>400 Ug/kg b.wt</td>
<td>5.9 ± 0.81*</td>
<td>6.1 ± 0.63*</td>
<td>12.4 ± 1.6**</td>
<td>32 ± 1.9**</td>
</tr>
<tr>
<td>Group II (subgroup A) &amp; Group III (subgroup A)</td>
<td>Non treated (As a control)</td>
<td>5.1 ± 0.52</td>
<td>5.4 ± 0.60</td>
<td>9.4 ± 1.2</td>
<td>25 ± 1.6</td>
</tr>
</tbody>
</table>

*Significant different from control at P< 0.05
**Highly significant different from control at < 0.01

Table (2): Semen picture of male Newzeland rabbit infested with Sarcoptic mite non treated or treated with Ivomec at different doses of Ivomec.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Dose</th>
<th>Progressive motility %</th>
<th>Live sperm %</th>
<th>Sperm cell conc X 106/ml</th>
<th>Total sperm abnormalities %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>200 Ug/kg b.wt</td>
<td>62 ± 1.50**</td>
<td>64 ± 2.11**</td>
<td>296.36 ± 8.22**</td>
<td>13.15 ± 0.42**</td>
</tr>
<tr>
<td>Group IV</td>
<td>400 Ug/kg b.wt</td>
<td>42.12 ± 0.8**</td>
<td>46.22 ± 1.92**</td>
<td>237.12 ± 7.12**</td>
<td>16.12 ± 0.61**</td>
</tr>
<tr>
<td>Group II (subgroup A) &amp; Group III (subgroup A)</td>
<td>Non treated (As a control)</td>
<td>73 ± 1.20</td>
<td>75 ± 2.12</td>
<td>362.51 ± 12.52</td>
<td>10.21 ± 0.15</td>
</tr>
</tbody>
</table>

*Highly significant different from control at < 0.01
Fig. (1): Rabbit spermatozoa treated by ivermectin (400 Ug/kg b.wt.) showed detached acrosome (a) and thin middle piece (b).

Fig. (2): Rabbit spermatozoa treated by ivermectin (400 Ug/kg b.wt.) showed elliptical head (a) and Abaxial tail displacement.

Fig. (3): Rabbit spermatozoa treated by ivermectin (400 Ug/kg b.wt) showed broken head (a) and bent tail (b).

Fig. (4): Rabbit spermatozoa treated by ivermectin (400 Ug/kg b.wt) showed Giant head with bent tail (a) and lancet head (b).
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المرشح العربي

(دراسة عن مدى كفاءة وأمان الأفرادن في الجريء في ذكور الأرانب وتأثيرها على جودة المسائل المنوية)

د. عمرو عامر

تتبنى الدوران على 28 من ذكور الأرانب النوروزي في الأبيض. قسمت إلى أربع مجموعات بكل مجموعة

1. أرانب المجموعة الأولى كانت مhältة في الباركر لمدة 90 يومًا وأعطيت علاج الأزمات بشكل

2. مكون من مكروجات وكمجع حراري من وزن الجسم مزمن بسمنة.

3. المجموعة الثانية ضمت أرانب مضيفة باللوب وضمت مع الأرانب السليمة وسبق إعطاءها الأزمات

4. كجرعة ثانية. المجموعة الثالثة ضمت أرانب مضيفة وضمت مع أرانب سليمة ولم يسبق إعطاءها

الأزمات. أما المجموعة الرابعة فقد كانت أرانب مضيفة باللوب وتم علاجها بصرف الارتفاعات المعالجة

المستخدمة في الجريء الأبيض.

لاحظت الدوران أن الأزمات كانت للأرانب السليمة من الجريء عند وصولها مع الأرانب السليمة. كما احتذ

أن الجريء ضعف العناية لم تؤدي إلى معركة على الأزمات السليمة. بل على العكس. كان لها تأثير سلبي على

صورة الدم وظائف خطرة الأزمات، حيث أظهرت زيادة في تناسل الأزمات الشكلية مع الحفاظ على

تركيزها وحركتها المبZYرة بالأسرة التي قامت الأزمات بجرعات أقل أو أكبر مع تعاطي الطائر.