THERAPEUTIC EFFECT OF ZANIDE, PARABENZOLE AND GENESIS ON GASTROINTESTINAL NEMATODIASIS IN SHEEP

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2Veterinary Teaching Hospital, Fac. Vet. Med., Benha University

SUMMARY

Gastrointestinal nematodiasis in sheep has economic importance in Egypt. It reduces body weight gain and leads to death of young lambs. In this study, we evaluated the efficacy of three anthelmintic drugs namely Zanide (Oxyclozanide + Levamisole), Parabenzole (Albendazole) and Genesis (Abamectin). Therefore, 4 groups (n=10) of adult sheep (50-100 average BW) were used. Group 1 had natural infestation with nematodes and treated with Zanide (15 mg Oxyclozanide / kg and 7.5 mg Levamisole /kg BW, orally). Group 2 had natural infestation with nematodes and treated with Parabenzole (5 mg Albendazole / kg BW, orally). Group 3 had natural infestation with nematodes and treated with Genesis (200 µg Abamectin / kg BW, subcutaneously). Group 4 included ten non-infested sheep and used as a control. The number of egg per gram (EPG) faeces was quantified by McMaster technique daily for 7 days post-treatment. Blood samples were collected before treatment and on the 1st, 2nd, and 3rd week post-treatment to determine RBCs counts, Hb concentration, PCV%, and differential leucocytic counts. Additionally, serum samples were collected for determination of total serum protein, albumin and globulin. Clinical signs included loss of appetite, anemia, emaciation, diarrhea and submandibular edema. The excretion of egg in faeces was completely disappeared on the 3rd, 4th, and 5th day post-treatment with Genesis, Zanide and Parabenzole, respectively. The RBCs count, Hb concentration and PCV% were significantly decreased (P<0.05) in the 3 groups before treatment compared to control but were gradually increased on the 1st, 2nd and 3rd week post-treatment. The total WBCs count, eosinophil % and neutrophil % were significantly increased before treatment but gradually decreased post-treatment in the 3 groups. On the other hand, lymphocytes were significantly decreased (P<0.05) pre-treatment and gradually increase post-treatment in the 3 groups. Serum total protein, albumin and globulin were significantly reduced (P<0.05) pre-treatment but gradually increased post-treatment. In conclusion, the changes in blood and serum parameters due to sheep nematodiasis were efficiently restored after the third week of treatment with Zanide, Parabenzole and Genesis. However, Genesis (subcutaneous) was faster and more effective than Parabenzole.
(oral) and Zanide (oral) in reducing the excretion of gastrointestinal nematode eggs in 

sheep.

INTRODUCTION

Gastrointestinal nematodiasis in sheep is among the commonest disease with 
economic concern (Perry et al., 2002) as they are one of the main destructive factors 
of animal health in Egypt (Hashem, 1997). It leads to reduction in live weight gain 
and wool growth and death of young lambs (Kimberling, 1988). There are many 

species of nematodes affecting sheep flocks producing productivity loss; some of 

them are localized in abomasum such as Trichostrongylus, Haemonchus, and 

Ostertagia (El-Azazy, 1990). Others live in large intestine, such as Trichuris, 

Chabertia and Oesophagostomum (Torina et al., 2004). Others live in small intestine, 

such as Capillaria, Bunastomum and Nematodirus (Vlassoff and McKenna, 1994).

The adverse effect of some worms may be induced by their feeding of blood 

(Haemonchus) leading to anemia (Fontenot et al., 2003), destruction of intestinal 
excretory epithelial cells with leaking plasma protein leading to hypoproteinaemia and 

subsequently emaciation and edema (Coop, 1989) or interference with reticulo-

ruminal motility leading to off food and weight loss (Armour et al., 1966). The end 

result of nematodiasis is production loss represented by reduction in body weight, 

milk production and impairing wool growth and inducing mortalities of young lambs.

Because of this economic importance, several anthelmintic drugs have been 

employed to control nematodiasis on regular basis. Anthelmintic drugs affect on 

nematodes either by acting as agonist of acetylcholine esterase receptor with induction 
of spastic paralysis, such as Levamisole (Martin, 1997), or by inhibition of tubulin 

polymerization, such as parabendazole (Valdez, 2002) or potentiation of inhibitory 

transmitters, such as Abamectin (Bloomquist, 1993).

The objective of this study was to delineate the clinical and hematological 

changes associated with sheep nematodiasis. Further objective was to evaluate the 
efficacy of three anthelmintic drugs - commonly used in Egypt- to control 
gastrointestinal nematodes in sheep. These drugs are Zanide, Parabenzole and 

Genesis. The efficacy was mainly evaluated by the reduction in the number of egg per 

gram (EPG) faeces. Other evaluating parameters included changes in the RBCs count, 

Hb concentration, PCV %, total and differential leucocytic counts, total protein, 

albumin and globulin.
MATERIALS AND METHODS

Animals

Forty native breed lambs with average weight of 75 kg and age of 1 year, from different flocks at Moshtohor area, Kalubia province, Egypt were used in this study. Thirty lambs were examined for the presence of gastrointestinal nematodes. In addition to the demonstration of a mixture of nematode eggs in faeces of these lambs, they also showed signs of diarrhea, off food, emaciation, anemia and submandibular edema. The infested sheep were allocated into 3 groups, each received a different treatment administered at the manufacturer's recommended dose rate. Another ten non-infested apparently healthy lambs were kept on parasitic-free area and used as a control (Table 1).

Table 1: Study design

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Active principle</th>
<th>Dose</th>
<th>Route</th>
<th>EPG faeces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n=10)</td>
<td>Zanide</td>
<td>Oxyclozanide</td>
<td>15 mg/kg BW</td>
<td>Oral</td>
<td>1630</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Levamisole</td>
<td>7.5 mg/kg BW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (n=10)</td>
<td>Parabenzole albendazole</td>
<td>5 mg/kg BW</td>
<td>Oral</td>
<td>760</td>
<td></td>
</tr>
<tr>
<td>3 (n=10)</td>
<td>Genesis</td>
<td>Abamectin</td>
<td>200 µg/kg BW</td>
<td>subcutaneous</td>
<td>700</td>
</tr>
<tr>
<td>4 (n=10)</td>
<td>Control</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

Parasitological Examination and egg counting

Fecal samples were directly collected from rectum daily for 7 days after treatment and examined qualitatively for nematode eggs as soon as possible in the same day according to Soulsby (1986). The degree of infestation was determined by counting the number of eggs per gram (EPG) faeces using McMaster technique according to Soulsby (1986). The efficacy of the anthelmintic drug was calculated as follow:

\[
\text{Efficacy} \% = \frac{\text{Mean EPG before treatment} - \text{Mean EPG after treatment}}{\text{Mean EPG before treatment}} \times 100
\]

Faecal Culture

Since some nematode eggs are morphologically confused together, fecal culture was used to identify the different species of nematodes in infested groups through examination of their larvae (Georgi and Georgi, 1990). This was followed
by collection the larvae from the culture and their staining by Lugol's iodine according to a modified Baermann's technique (Thomas et al., 1970).

Blood and Serum Examination

Two Blood samples were collected from all sheep before treatment and on the 1st, 2nd and 3rd week post-treatment. The first blood sample was collected on potassium EDTA for haematological examination including determination of total leucocytic (WBCs) and erythrocytic count (Schalm et al., 1975), PCV % (Coles, 1986), and Hb content (Wintrobe et al., 1976). The second blood sample was collected without anticoagulant to separate serum. Collected sera were used to determine the total proteins (Doumas et al., 1981), albumin and globulin (Doumas and Biggs, 1972).

Statistical Analysis

All data were represented by means ± standard error of the mean (SEM). All tests were carried out by using Sigma Stat 3.1, a statistical software for data analysis (SPSS Inc., Chicago, IL, USA). A one-way analysis of variance (ANOVA) with Holm-Sidak posthoc test was used to determine the significant changes between experimental groups and control. All differences were considered statistically different at P < 0.05 or P < 0.001.

RESULTS

Clinical Signs

Infested animals showed varying degrees of diarrhea, loss of appetite, paleness of mucous membranes, emaciation, poor wool growth and submandibular edema. There were no mortalities among infested lambs.

The Types of Nematode Infesting Sheep

From fecal examination, Nematodirus and Trichuris species were identified from their characteristic egg. After fecal culture of positive sample of infested groups, at least six species of gastrointestinal nematodes were identified from their larvae. These include: Trichostrongylus (short length of caudal sheath extension), Homonchus (sheath kinked at the tip of tail), Ostertagia (distinct round tail), Cooperia (medium length of caudal sheath extension), Chabertia (long length of caudal sheath and medium sized larva) and Oesophagostomum (long length of caudal sheath) (Figure 1).
Figure 1: The third stage larvae (stained with Logul's iodine) of nematodes infesting sheep in experimental groups. A: Trichostrongylus species (short length of caudal sheath extension). B: Homonchus species (sheath kinked at the tip of tail). C: Ostertagia (distinct round tail). D: Cooperia (medium length of caudal sheath extension). E: Chabertia (long length of caudal sheath and medium sized larva). F: Oesophagostomum (long length of caudal sheath). Magnification is 100 X.

Effect of Treatment on EPG of Faeces

The mean value of EPG of faeces in sheep treated with Zanide was 1630 before treatment which completely disappeared on the 4th day post-treatment. The mean value of EPG of faeces in sheep treated with Parabenzole was 760 before treatment which completely disappeared on the 5th day post-treatment. While in the 3rd group which was treated with Genesis, the mean value of EPG of faeces was 700 before treatment and completely disappeared on the 3rd day post-treatment (Table 2). The efficacy %
of Genesis was higher than Zanide and Parabenzole starting from the first day post-treatment (Figure 2).

Table 2. Anthelmintic efficacy (%) of Zanide, Parabenzole and Genesis.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Zanide-treated</th>
<th>Parabenzole-treated</th>
<th>Genesis-treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>EPG</td>
<td>Efficacy %</td>
<td>EPG</td>
</tr>
<tr>
<td>Day 0</td>
<td>1630</td>
<td>0</td>
<td>760</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; day</td>
<td>540</td>
<td>66.9</td>
<td>400</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; day</td>
<td>120</td>
<td>92.6</td>
<td>320</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; day</td>
<td>20</td>
<td>98.8</td>
<td>120</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>0</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>6&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>7&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2. Efficacy of Zanide, Parabenzole and Genesis on reduction of EPG of faeces in sheep with natural nematodiasis. The efficiency of Genesis is higher than Parabenzole, which is higher than Zanide.

Effect of Treatment on Haematological and Serological Parameters

A- RBCs Count, Hb Concentration and PCV%

The total RBCs count was highly significantly decreased (P < 0.001) and the PCV % and Hb were significantly reduced (P < 0.05) in infested groups compared to control non-infested. These parameters were gradually increased after treatment with Zanide, Parabenzole and Genesis (Table 3, Figure 3).
B- WBCs and Differential Leucocytic Count

The total WBCs count, eosinophil and neutrophil percentage were highly significantly increased (P < 0.001) and the lymphocyte % was highly significantly reduced (P < 0.001) in infested groups compared to control non-infested. These parameters were changed gradually after the 1st, 2nd and 3rd week toward the control values after treatment with Zanide, Parabenzoie and Genesis. The monocyte % and basophile % were not significantly increased in infested groups (Table 4, Figure 4).

C- Serum Total Protein, Albumin and Globulin.

The serum total protein, albumin and globulin were highly significantly decreased (P < 0.001) in infested groups compared to control. These parameters were gradually increased toward the normal values after treatment. (Table 5, Figure 5).

Comparison between the 3 treatment groups at any particular time point did not reveal significant difference for any hematological or serological parameters measured.
### Table 3. Haematological parameters in infested and control groups before treatment and on the 1st, 2nd and 3rd week post-treatment.

<table>
<thead>
<tr>
<th>Group</th>
<th>Control (non-infested)</th>
<th>Zanide-treated group</th>
<th>Parabenzole-treated group</th>
<th>Genesis-treated group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-treatment</td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>31.1 ± 0.737</td>
<td>27.15 ± 0.691*</td>
<td>28 ± 0.422*</td>
<td>29.1 ± 0.795</td>
</tr>
<tr>
<td>Hb (mg/dl)</td>
<td>8.14 ± 0.136</td>
<td>7.15 ± 0.168*</td>
<td>7.31 ± 0.125*</td>
<td>7.84 ± 0.119</td>
</tr>
<tr>
<td>RBCs (x 10^6)</td>
<td>9.632 ± 0.256</td>
<td>7.065 ± 0.763**</td>
<td>8.064 ± 0.256*</td>
<td>9.495 ± 0.498</td>
</tr>
</tbody>
</table>

- Results are represented by means ± standard error (SE)
- * Indicates significant difference compared to control group at P < 0.05.
- ** Indicates highly significant difference compared to control group at P < 0.001

**Figure 3.** The RBCs count (A), Hb concentration (B) and PCV% (A), are gradually increased after treatment with Zanide, Parabenzole and Genesis.
<table>
<thead>
<tr>
<th>Group</th>
<th>Control (non-infested)</th>
<th>Zanide-treated group</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-treatment</td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
</tr>
<tr>
<td></td>
<td>WBCs</td>
<td>11.482 ± 0.579**</td>
<td>12.693 ± 0.624**</td>
<td>11.483 ± 0.421**</td>
</tr>
<tr>
<td></td>
<td>(10^3/mm^3)</td>
<td>11.171 ± 0.688**</td>
<td>12.942 ± 0.624**</td>
<td>11.483 ± 0.416**</td>
</tr>
<tr>
<td></td>
<td>Monocyte %</td>
<td>0.68 ± 0.15</td>
<td>0.96 ± 0.244</td>
<td>0.88 ± 0.228</td>
</tr>
<tr>
<td></td>
<td>Lymphocyte %</td>
<td>63.1 ± 1.12</td>
<td>51.17 ± 1.083**</td>
<td>50.24 ± 1.323**</td>
</tr>
<tr>
<td></td>
<td>Eosinophil %</td>
<td>1.99 ± 0.158</td>
<td>5.85 ± 0.0872**</td>
<td>6.14 ± 0.555**</td>
</tr>
<tr>
<td></td>
<td>Basophil %</td>
<td>0.29 ± 0.148</td>
<td>0.4 ± 0.221</td>
<td>0.63 ± 0.277</td>
</tr>
<tr>
<td></td>
<td>Neutrophil %</td>
<td>33.34 ± 0.832</td>
<td>41.02 ± 1.022**</td>
<td>42.09 ± 1.791**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-treatment</td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
</tr>
<tr>
<td></td>
<td>WBCs</td>
<td>5.66 ± 0.445</td>
<td>11.482 ± 0.579**</td>
<td>13.549 ± 0.752**</td>
</tr>
<tr>
<td></td>
<td>(10^3/mm^3)</td>
<td>11.171 ± 0.688**</td>
<td>12.693 ± 0.624**</td>
<td>11.483 ± 0.421**</td>
</tr>
<tr>
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- Results are represented by means ± standard error (SE).
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- ** Indicates highly significant difference compared to control group at P < 0.001.
Figure 4. The total leucocytic count (A), the percentage of monocyte (B), eosinophil (C) and neutrophil (D) are gradually increasing while the lymphocyte % (E) is gradually increasing after treatment with Zanide, Parabenzole and Genesis.
Table 5. The total protein, albumin and globulin in infested and control groups before treatment and on the 1\textsuperscript{st}, 2\textsuperscript{nd} and 3\textsuperscript{rd} week post-treatment.

<table>
<thead>
<tr>
<th>Group (non infested)</th>
<th>Parameter</th>
<th>Control Pre-treatment</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Zanide-treated group</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Parabenzole-treated group</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Genesis-treated group</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total protein (gm/dl)</td>
<td></td>
<td>7.884 ± 0.168</td>
<td>4.791 ± 0.214</td>
<td>5.444 ± 0.229</td>
<td>6.355 ± 0.278</td>
<td>6.919 ± 0.323</td>
<td>5.929 ± 0.275</td>
<td>6.608 ± 0.288</td>
<td>7.21 ± 0.282</td>
<td>6.355 ± 0.278**</td>
<td>7.12 ± 0.284**</td>
<td>7.306 ± 0.284**</td>
<td>7.20 ± 0.282**</td>
<td>6.919 ± 0.284**</td>
<td>6.355 ± 0.278**</td>
<td>7.12 ± 0.284**</td>
<td>6.355 ± 0.278**</td>
</tr>
<tr>
<td>Albumin (gm/dl)</td>
<td></td>
<td>2.698 ± 0.16</td>
<td>1.594 ± 0.127**</td>
<td>1.807 ± 0.158**</td>
<td>2.324 ± 0.201</td>
<td>2.363 ± 0.155</td>
<td>1.747 ± 0.144**</td>
<td>1.916 ± 0.163*</td>
<td>2.397 ± 0.205</td>
<td>2.583 ± 0.122</td>
<td>1.419 ± 0.136**</td>
<td>1.672 ± 0.164*</td>
<td>2.251 ± 0.144</td>
<td>2.39 ± 0.136**</td>
<td>1.419 ± 0.136**</td>
<td>1.672 ± 0.164*</td>
<td>2.251 ± 0.144</td>
</tr>
<tr>
<td>Globulin (gm/dl)</td>
<td></td>
<td>5.186 ± 0.286</td>
<td>3.196 ± 0.199*</td>
<td>3.637 ± 0.324*</td>
<td>4.001 ± 0.236*</td>
<td>4.656 ± 0.337</td>
<td>3.745 ± 0.401*</td>
<td>4.113 ± 0.365*</td>
<td>4.221 ± 0.324*</td>
<td>4.627 ± 0.335</td>
<td>4.054 ± 0.195*</td>
<td>3.871 ± 0.202*</td>
<td>4.448 ± 0.257</td>
<td>5.022 ± 0.293</td>
<td>4.054 ± 0.195*</td>
<td>3.871 ± 0.202*</td>
<td>4.448 ± 0.257</td>
</tr>
<tr>
<td>Albumin /Globulin ratio</td>
<td></td>
<td>0.546 ± 0.0689</td>
<td>0.517 ± 0.0567</td>
<td>0.561 ± 0.215</td>
<td>0.603 ± 0.0705</td>
<td>0.532 ± 0.0695</td>
<td>0.545 ± 0.0488</td>
<td>0.616 ± 0.0854</td>
<td>0.610 ± 0.0726</td>
<td>0.545 ± 0.0947</td>
<td>0.616 ± 0.0854</td>
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![Figure 5](image-url) The total plasma protein, albumin and globulin are gradually increasing in lambs with gastrointestinal nematodiasis after treatment with Zanide, Parabenzole and Genesis.
DISCUSSION

Parasitic gastroenteritis is one of the major causes of productivity loss in sheep (Torina et al., 2004). The clinical signs observed in infested groups were gradual loss of condition, decreased food intake, varying degrees of diarrhea, emaciation, pale mucous membranes, and submandibular edema.

The loss of appetite and indigestion observed in infested groups were explained by a number of investigators. Developing larvae within the gastric glands of the abomasum produce distension of the lumen of these glands with subsequent stretching of the cellular lining. As a result, the mature functional parietal and peptic cells are replaced by undifferentiated cells and indigestion results (Armour et al., 1966). Additionally, abomasal nematodes, such as trichostrongylus, homonchus and chabertia, elevate gastrin level in infestation that impairs reticulo-ruminal motility and slows abomasal emptying leading to stasis of ingesta and hence reduction in feed intake (Armour et al., 1966).

The intestinal nematodes infestation are associated with inflammatory changes, thickening of the mucosa and stunting or flattening of the villi, reduction of enzyme activity and poor retention and utilization of nitrogen. These lead to production losses, hypoalbuminemia and edema (Radostits et al., 2000). This may explain the submandibular edema observed in infested sheep.

The occurrence of anemia in infested groups, which was manifested clinically by paleness of mucous membrane, was attributed to the presence of Haemonchus infestation. Haemonchus contortus is described as a blood feeder worm that may lead to anemia (Fontenot et al., 2003). In addition, it contains a detergent soluble factor (as pore-forming agent) that haemolyses sheep red blood cells and consequently leading to anemia. Haemonchosis also results in a general wasting condition, with sheep becoming unthrifty and emaciated, which resembles a state of malnutrition. It also decreases growth rates and the fleece may be open and dull (Armour and Coop, 1991).

The reduction in the PCV%, Hb concentration and RBCs count in infested groups indicated that gastrointestinal nematodiasis, particularly haemonchosis, induces blood loss followed by anemia in infested lambs. This result was recently confirmed by Chen et al., (2005).

Although mortalities were observed with gastrointestinal nematodiasis in some previous studies (Johnston et al., 1980; Handayani and Gatenby, 1988; Reinecke,
1994; and Waller et al., 1999), there were no mortalities recorded within infested groups during this experiment. This may be attributed to the short period of experiment (3 weeks), which decreases the chance of observing mortalities among infested lambs.

The total protein, albumin and globulin were significantly reduced in infested lambs compared to control, suggesting loss of plasma proteins, liver or kidney diseases. Developing larvae and adult worms burrow just beneath the surface epithelium of the small intestine causing sloughing and disruption of cells and leakage of plasma protein into the lumen of the small intestine leading to hypoproteinaemia (Coop, 1989), which in turn leading to submandibular edema.

The leucocytosis observed in infested groups was mainly attributed to the reaction of the host against the invading parasite or may be due to a sensitivity of the host against the secretory products of the parasite as reported by Schalm et al. (1975). These results agreed with those revealed by EI-Fauomy (1989), Mottelib et al., (1992), and Salem (2004).

Because of the economic importance of gastrointestinal nematodiasis, three commonly used anthelmintics in Egyptian market namely Zanide, Parabenzole and Genesis were used for control and treatment of this disease. These three drugs possess different mechanisms as being anthelmintics. Levamisole (in Zanide) exerts its therapeutic effect by acting as a full agonist of the nicotinic receptor of acetylcholine of nematode muscle leading to depolarization of the somatic muscle of nematodes causing spastic paralysis (Martin, 1997 and Rayes et al., 2004). Albendazole (in Parabenzole) binds selectively to beta-tubulin of nematodes and inhibits microtubule formation and therefore preventing cell division (Martin, 1997). Abamectin (in Genesis) acts by inhibiting transmission of nerve impulses across the neuromuscular synapse by activation and opening of chloride channel leading to paralysis and death of nematodes (Bloomquist, 1993).

The excretion of nematode eggs in faeces was completely disappeared on the 3rd day post-treatment in Genesis-treated lambs, while in Zanide, it stopped on the 4th day and in Parabenzole on the 5th day. This result suggested that Genesis had a higher anthelmintic efficiency than Zanide and Parabenzole. Moreover, the efficiency was higher in the first (77.1%) and second (94.3%) day after treatment in Genesis-treated group than Zanide- (66.1%, 92.6%) and Parabenzole- (47.4%, 57.9%) treated groups.
This indicates that Genesis induced higher efficiency from the first day of subcutaneous administration.

The total erythrocytic and leucocytic counts as well as the differential leucocytic count were gradually changed toward the control value after treatment with Zanide, Parabenzole and Genesis. This result might be attributed to the anthelmintic effect of the three drugs that result in death of the worms, thereby reducing their harmful effects. Because there were no significant differences in all measured parameters between the three treatment groups at any time point, it is suggested that three products are effective in elimination of gastrointestinal nematodiasis in sheep. However, Genesis (Abamectin) was superior in suppression of egg excretion than Zanide and Parabenzole. This result is consistent with the finding of Alka et al. (2004) who found that Abamectin (oral) was more efficient in controlling Trichostrongylus than ivermectin.

In conclusion, nematodiasis induced anemia in sheep (expressed as a reduction in RBCs count, Hb concentration and PCV %), leucocytosis, eosinophilia, neutrophilia, lymphocytopenia, hypoproteinaemia, hypalbuminemia, and hypoglobulinemia. These parameters were efficiently restored after the third week of treatment with Zanide, Parabenzole and Genesis. However, Genesis (subcutaneous) was faster and more efficacious than Parabenzole (oral) and Zanide (oral) in ameliorating the excretion of gastrointestinal nematode eggs in sheep.
REFERENCES


التأثير العلاجي للزائيد والبارابينزول والجينيزيز على الديدان الإسطوانية في معي وامام

الاغانم

Muhammad Gamal and Abdulmonem Muhammad Mohamed2

1قسم طب الحيوان بكلية الطب البيطري بمستهل – جامعة بنها

2المستشفى البيطري التعليمي بكلية الطب البيطري بمستهل – جامعة بنها

واستندت ويعقوت على اساسات اجمالاقة في مصر لانها تؤدي الى

اخصوي وضع ومتوئ المحلاين. ولذلك تم تقييم فاعلية ثلاث ادويه مضادة للديدان في هذه الدراسة

باستخدام الزائيد (أوكسيكوليوزيد + ليفامازول) والبارابينزول (النندازول) والجينيزيز

(ابامكتين). استخدمت 4 مجموعات (عدد 10 اغام لكل مجموعة). المجموعة الأولى كانت

مساحة طبيعاً بالديدان الإسطوانية وعولجت بالزائيد (15 مجم / كجم ) عن طريق الفم.

المجموعة الثانية كانت مساحة طبيعاً بالديدان الإسطوانية وعولجت بالبارابينزول (5 مجم / كجم )

عن طريق الفم. المجموعة الثالثة كانت مساحة طبيعاً بالديدان الإسطوانية وعولجت بالجينيزيز

(20 مجم / كجم ) عن طريق الحفون تحت الجلد. احتوت المجموعة الرابعة على 10 اغام غير

مساحة واستخدمت ك룹عة ضابطة. تم عد البويضات لكل جم من البراز باستخدام خطي

الميكروسكوبية لمدة 7 أيام لبعد العلاج. ثم تجميع عينات دم قيل العلاج وبعد أسبوع واسبوع

PCV وثلاثة اسابيع بعد العلاج لتحديد عدد كرات الدم الحمراء وتركيز الهيموجلوبين ونسبة

والعد التمثيلي لخلايا الدم البيضاء. هذا بالإضافة الى تجميع عينات سيرم لتحديد مستوي

البروتين الكلي والألبومين والجلوبيولين. تضمنت الاعراض فقدان الشهية وانعكاس وتجفيف

واسهال وتجمع مايتي تحت الفك، لوحظ احتفظ بويضات الديدان الإسطوانية في اليوم الثالث

والرابع والخامس بعد العلاج بالجينيزيز والزائيد والبارابينزول على التوالي. وجد نقص معنوي

في عدد كرات الدم الحمراء وتركيز الهيموجلوبين ونسبة PCV والعد التمثيلي في الثلاث

المجموعات المصابة مقارنة بالمجموعة الضابطة و زادت هذه القياسات بالتدريج بعد الاسوع

الأول والثاني والثالث من العلاج. وجد أيضاً زيادة معنوية في العدد الكلي لخلايا الدم البيضاء

وسبة الأزونوفيال والنيتروفيال قبل العلاج و زادت هذه القياسات بالتدريج في المجموعات المصابة

بعد العلاج الى جانب الآخر، نقصت خلايا الليفافية قبل العلاج و زادت بالتدريج في

المجموعات المصابة بعد العلاج. وجد نقص معنوي في مستوى البروتين الكلي والألبومين

والجليوبولين قبل العلاج و زادت بالتدريج في المجموعات المصابة بعد العلاج. خصصت النتائج

على ان التغيرات التي تمثل في الدم والسيرة تمحتت بهدف تدقيق ان تأثيرات ما بعد الاسبوع الثلاث

بالجينيزيز والزائيد والبارابينزول ولكن كانت كفاءة الجينيزيز اسرع من الزائيد والبارابينزول

في تقليل عدد بويضات الديدان الإسطوانية في الاغانم.