Comparison between Using of BUPAQUONE® and Other Compounds in Treatment of Bovine Theileriosis

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Abstract

The study included that 35 clinically infected cattle were subjected for the clinical therapeutic trail. The age of these animals ranged from one day to above five years old. In the clinical therapeutically trail we used BUPAQUONE® as a new drug for treatment of tropical theileriosis it gave 91.4 % as an accuracy rate in general but if the diseased animals detected and treated as early as possible the accuracy rate reached 100%, in cases that complicated with respiratory signs the accuracy rate depended on the type of antibiotic that used as a treatment for control of the respiratory affection. Cases that received BUPAQUONE with Oxytetracycline hydrochlorid as antibiotic therapy for diseased animals the accuracy rate was 81.8% but in cattle that received BUPAQUONE with Marbofloxacine as antibiotic therapy the accuracy rate was 93.3%. So we can conclude that Marbofloxacine is more preferred as antibiotic treatment in cases of tropical theileriosis that suffered from respiratory signs.

We concluded that, Bupaquone® is recommended as a treatment for tropical theileriosis but in some cases that are complicated with respiratory signs using of antibiotics are recommended such as Marbofloxacine 10% which recorded higher rate of recovery than Oxytetracycline 20% long acting in control of respiratory complication of the tropical theileriosis

Keywords: Cattle – Buffaloes – Theileriosis – Bupaquone – Marbofloxacine

Introduction

Theileria annulata is transmitted by ticks of genus Hyaloma and more than 250 million domestic cattle have been estimated to be at risk from tropical theileriosis. In Egypt, Theileria annulata is one of the piroplasms infecting both cattle and buffaloes. The Egyptian cattle act as reservoir hosts for Theileria annulata which is the causative hemoprotozoan of Egyptian fever. Buffaloes reported as relatively more resistant to Theileria species infestation as cattle. In Egypt, the disease is considered to be one of the most destructive obstacles to livestock production.

The disease starts with high fever and swelling of the superficial lymph nodes draining the area where the infected tick have been feeding, general symptoms associated with febrile infectious disease soon follow: Restlessness, accelerated pulse and respiratory rate, anorexia, milk production drops suddenly and constipation is common but may be followed by tarry like diarrhea, hemoglobinuria. Anemia dominates the picture at the final stage and icterus may be occurs.

Treatment of bovine theileriosis is of great importance because of high morbidity and prolonged convalescent period. Wide range of antibacterial and antiprotozoal drugs have been tested. Oxytetracycline hydrochloride alone has no therapeutic value in the treatment of Theileria annulata infection. Oxytetracycline HCL at dose 50 ml daily for 3 days or 30 ml daily for 5 days I / V was completely effective against schizonts. Buparvaquone is a second–generation hydroxynaphthoquinone related to parvaquone, with novel features that make it promising compound for the therapy and prophylaxis of all forms of theileriosis. Buparvaquone, currently the most effective anti-theilerial drug for cattle, has been extensively tested invitro and in vivo. Buparvaquone in a single dose of 2.5 mg / kg b.w. I / M suppressed the infection, the clinical signs of theileriosis disappeared and parasitaemia failed to 1%. It is recommended for treatment of clinical theileriosis at 2.5 mg / kg b.w., but a second dose may be necessary. The effect of the drug is directed against the parasites and not against the host cells.

Buparvaquone eliminates the parasites and thus prevents the transmission of signals necessary for induction of genes coding for growth factor and for the receptors involved in signal transduction. Buparvaquone (BW 720C), with supportive therapy, is a promising compound for the treatment of...
bovine tropical theileriosis, also used for chemoimmunoprophylaxis of theileriosis caused by *Theileria annulata* 18,27. Buparvaquone is indicated in treatment of tropical theileriosis but that treatment must start as soon as the clinical signs are noticed: early intervention is the key to success 21,14,4. Marbofloxacin is a new third generation fluoroquinolone developed exclusively for veterinary use 26. It has broad spectrum bactericidal activity against Gram negative bacteria, including *Mannheimia haemolytica* and *Haemophilus species*, Gram positive bacteria and Mycoplasma species 8,28,19. Marbofloxacin is used for the treatment of bovine respiratory disease and calf neonatal diarrhea 28,11.

### Materials and Methods

**Animals:**
A total number of 150 cattle and 35 buffalo belong to different localities in EL- Fayoum, EL-Minia, Assuit, Sohage and EL-Wady EL-Gaded governorates were subjected to this study. In addition to 35 clinically infected cattle were subjected for the clinical therapeutic trial. All animals showed acute or chronic forms of tropical theileriosis with different degrees of tick infestation. Blood sample was collected directly from the ear vein and used for preparation of blood films. Lymph node aspiration were collected from enlarged lymph nodes these samples were marked with numbered labels in the field and used for preparation of lymph smears immediately after collection. All animals in this study were subjected to clinical examination according to 24. All animals that included in this study were considered as clinically suspected cases, those animals showed various degrees of the characteristic clinical signs for the tropical theileriosis like fever (>40°c),enlargement of the superficial lymph nodes (acute form), in appetite, pale or congestion of the visible mucous membranes, conjunctivitis, severe congestion of the eyes, excessive lacrimation, corneal opacity, various degrees of respiratory signs from serous nasal discharge to cough , bloody purulent nasal discharge and dyspnoea (chronic form). In addition to various degrees of ticks infestation.

**Conventional diagnosis:**
Thin blood films were prepared immediately after taking the whole blood samples direct from the ear vein also the lymph smears were prepared immediately in the field to allow these smears to dry by air then both samples were fixed by using methyl alcohol for about 3-5min., allow them to dry by air after fixation step then stained with Giemsa stain diluted at 8% with bidistalied water for about 30-45 min. Dried by air and examined on Olympus microscope by using Oil immersion lens at x1000 magnification. Four lymph smears were examined for each animal to detect the macroschizonts and microschizonts and six thin blood films from each animal were examined for detection of piroplasms or trophozoite

**Drug & treatment trial:**
Buparvaquone, "Bupaquone" (BVP Ltd .co. Kerry, IRLAND) was used to treat thirty–five clinically infected animals that were conventionally confirmed diseased with tropical theileriosis. Bupaquone is a clear dark–red solution for injection deeply intramuscular at dose rate of 2. 5 mg / kg body weight; dispensed in 50 ml multi-dose vials, each milliliter of which contains 50 mg buparvaquone. A single dose of 2.5 mg per kg b.w. (1 ml Bupaquone per 20 kg/b .w.) is normally sufficient; in severe cases a second dose required for administer within 48:72 hours after the initial dose where the volume for injection exceeds 10 ml administer in two injection sites. The withdrawal period of Bupaquone for meat & milk is 42 days and 48 days, respectively. The animals in the clinical therapeutically trial were classified to three groups according to their ages group (1) below one year old which includes 19 animals, group (2) below three years old which includes 13 animals and group (3) below five years old which includes 3 animals. The animals' weights were determined before injection of the drug as a therapeutic dose. Selected groups were treated with Bupaquone alone, in cases of animals suffering from tropical theileriosis without any respiratory complication. On the other hand, animals that suffered from respiratory complication during the course of the disease were treated by using Bupaquone, in addition to antibiotic therapy to avoid the loss of animals, that usually arising from pulmonary failure, like Marbofloxacine 2 mg/kg b.w.(Marbocyl 10% 1ml per 50 kg b.w, Intercova, animal health products-Egypt) intravenous or intramuscular or by using oxyteteracycline HCL L.A. 20% 200 mg /kg b.w. (1ml per 10 kg b.w.) intramuscular. Each animal was re–examined clinically and parasitological by using blood film and lymph smears 48 hours after the first treatment and then 48 hours as intervals as necessary. A further visit was made three to four days after the last treatment according to 7, then the follow up was carried out till eight weeks after the treatment.
Tick control was carried out in all animals that were subjected to the clinical therapeutically trial, through injection of the ivermectine 1 ml/50 kg b.w. subcutaneous twice with two weeks interval or by using Butoux (synthetic pyrithroides) as insecticides in combination with organ phosphorous compounds for the places this will be an important step in the treatment program to avoid the re-infection.

Results

Thirty–five cattle were confirmed positive for tropical theileriosis based on clinical examination and conventional diagnostic tests were subjected to the clinical therapeutically trial. The results of the therapeutically trial revealed that the rectal body temperature response following BUPAQUONE treatment showed that all cattle had rectal temperature around normal values (38.5-39.5°C) on day of treatment that were 40.5-42°C before treatment, all of them showed normal values (38.5-39.5°C) by day two or three after treatment and then still within the normal range of temperature, other clinical signs resolved within one to two weeks after treatment and completely disappeared, and the animal returned to its normal conditions clinically and parasitological using Giemsa stained blood film “free blood film and normal size superficial lymph nodes” by ten to fifteen days of treatment. Some animals were heavy infested with the protozoan parasite so received 2nd dose of BUPAQUONE, other animals that suffered from respiratory affection showed the signs of recovery after the first dose of the BUPAQUONE and second to third doses of antibiotic that were used for three to five days with excessive doses daily. Out of 35 treated cattle 32 were recovered with recovery rate 91.42%. Out of them 9 received BUPAQUONE alone and all of them cured with recovery rate 100%. When 11 animals were treated with BUPAQUONE and Oxytetracycline hydrochlorid 20% as antibiotic therapy and the recovery rate in this group was 81.81%. Finally 15 animals received BUPAQUONE and Marbofloxacin 10% (Marbocyl 10%) as antibiotic therapy those cases suffering from respiratory affection that considered as complication to the tropical theileriosis infection and the recovery rate in this group was 93.33% (Table 1).

Table 1. Clinical and conventional evaluation of Bupaquone®as a treatment for tropical theileriosis in cattle

<table>
<thead>
<tr>
<th>AGE</th>
<th>Bupaquone only</th>
<th>Bupaquone with oxytetracycline HCL</th>
<th>Bupaquone with marbofloxacin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. OF CASES</td>
<td>Cured cases</td>
<td>%</td>
</tr>
<tr>
<td>&lt;= 1 year</td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>1 year : &lt;= 3 years</td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>3 years : &lt;= 5 years</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>9</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion

In this study we used Buparvaquone, (Bupaquone®) as antitheilerial drug, from our clinical therapeutically trial we can concluded that Bupaquone® is a suitable, recommended drug for treatment of tropical theileriosis it gave (91.4%) cure rate in all treated cases (32/35) this recovery rate
comparable to another that were obtained by earlier authors. In Tanzania reported 97.1%, in Egypt recorded 86.66%, in Kenya reported 90.0%, in Tanzania recorded 95.2% as a recovery rates when used Buparvaquone as a treatment for cases of theileriosis. Criteria used for declaration of the cured cases following, Buparvaquone® treatment were described. Appetite restored, productivity improved, drop of rectal body temperature to normal values 37.5:39.5°C with disappearance of pulmonary signs and ocular lesions (resolution of clinical signs), Theileria annulata schizonts cleared or degenerated and no active lymphocytosis (parasitological basis)14. But also, we found that the recovery rate may reach (100%) if the infected animal can be detected and treated using Buparvaquone® as early as possible without any complication this was in agreement with in Egypt who reported that the recovery rate of 100% was recorded in early diagnosed cases of tropical theileriosis those were treated with Butalex®. In late or chronic cases which usually complicated with pulmonary disorders, using of antibiotics with Buparvaquone as a combination for treatment usually recommended14. In our trial we used two different categories of these antibiotics include: Oxytetracycline 20% L.A. or Marbofloxacine 10% (Marboetyl 10%) and the results concluded that Marbofloxacine 10% was more effective, suitable and recommended in treatment of pulmonary disorders, this results is in agreement with who reported that the effectiveness of Marbofloxacine 10% in treatment of pulmonary disorders in cattle. So that Marbofloxacine 10% is better to recommended as a treatment of pulmonary disorders occurred as a complication in cases suffering from tropical theileriosis than Oxytetracycline 20% L.A. they gave recovery rates equal to 93.33% and 81.81%, respectively (table1).

References


