



## **Diagnostic, Hematological and Therapeutic Studies on Theileriasis in Cattle in Babylon**

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**Abstract :** The target of this study is to evaluate hematological changes in theileria in cattle and to evaluate the efficacy of some drugs in treatment it. 24 cows divided in to four group ,first is control ,second is infected showed clinical signs varied from rise of body temperature, nasal and ocular discharge, corneal opacity, diarrhea, pale mucous membranes, associated with enlargement of lymph nodes in some cases,third is treated with butalax and fourth with oxytetracycline and butalex, The obtained results showed a significant ( $P<0.05$ ) decrease in haemoglobin, packed cell volume and white blood cells counts compared to the control group... The hematological parameter showed the Hypochromic macrocytic anemia with significant decreases in Hb( $6.4833\pm 0.9152$ ) g/l, PCV( $23.666\pm 2.7325$ )%, MCHC ( $25.4000\pm 1.5231$ )%, RBCC( $3.7333\pm 0.80911$ ) $10^6$ /mm, WBCC( $5.5833\pm 0.60470$ ) $10^6$ /mm, neutrophils ( $20.3333\pm 1.63299$ )% while recorded a significant increases in the lymphocytes ( $77.4833\pm 4.01020$ )% MCH( $10.8333\pm 1.47196$ ) and MCV( $60.333\pm 3.0767$ )fl Various formulations have been used for the treatment of theileriosis. Among these, Buparavaquone has been considered as the drug of choic in case acute and oxytetracycline and Buparavaquone in case chronic.

**Key words:** hematological, cattle, oxytetracycline, butalex.

### **Introduction**

Tropical theileriosis is one of the most prevalent and economically important fatal diseases of cattle in Iraq<sup>1,2</sup> and it consider atick-bornedisease caused by *Theileria annulata* and transmitted by ticks from genius *Hyalomma*spp<sup>1</sup>. *T. annulata* is pathogenic and causes tropical theileriosis with high morbidity and mortality in cattle. The disease threatens an estimated 250 million cattle and acts as a major constraint on livestock production and improvement in many developing countries. *T. annulata* is more widely distributed in many areas of the world, extending from southern Europe to southern Asia<sup>3</sup>

The clinical signs in the infected animals were fever pyrexia enlargement of superficial lymph nodes, nasal and ocular discharges, salivation, anemia, respiratory distress and eye lesions<sup>4</sup>. Diagnosis of theileriosis is mainly based on clinical signs of the infected animals and confirmed by microscopic examination of Giemsa stained thin blood and lymph node smears . Antitheilerial drug as buparvaquone has been used effectively in the treatment of tropical theileriasis in the field<sup>5</sup>There is no safe and efficacious vaccine against tropical theileriosis in Egypt and control of the disease is mainly based on the chemotherapy and tick control<sup>4</sup>-*Butalex*

(Buparvaquone) can be used in the treatment of recently infected animals with *Theileria annulata* in single dose of 2.5 mg/kg body weight intramuscular with efficacy varied from 88.7%<sup>6</sup> (to 100%<sup>7</sup>

**Materials and method**

**Experimental Design:**

24 cow which divided into four equal groups, 1st group healthy cow as control, 2nd group cow suffering from theileriosis and 3rd group that give drug butalex and fourth treated with oxytetracycline and butalex. Clinical examination body temperature, rate of respiration, Two blood samples were taken from each animal by jugular vein.

Microscopic examination: Methanol used for 1 min for fixation of blood smears and Giemsa diluted in 5 %buffer solution used for staining for 30 minutes. Then blood smears were examined at 1000x magnification(8).

Blood sample was collected from ear vein, and used for marking blood film. Another a blood sample was collected by vein puncture of the jugular vein 5 ml EDTA tube and 5 ml without EDTA (gel tubes) .

**Haematological Examination**

Haematological examination was done according to (9), including red blood cells count (RBCC) and white blood cells count (WBCC) , Hemoglobin Concentration (Hb), Packed Cell Volume (PCV), Differential White Blood Cells Count (DWBCC) , Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC).

**Statistical analysis**

In order to determine the statistical significances among different variables SPSS program (Statistical program for social sciences) .All hematological test values were expressed as mean and stander error of mean and P<0.05 was considered as statistically significant.

**The result and discussion**

Cattle infected with theileriosis showed enlargement of the superficial lymphnodes beside anorexia, congested mucous membranes anemia. Clinical observation of the cattle infected with thelaria species were in agreement with the findings of other studies<sup>9,10</sup> who stated that the main clinical signs in buffaloes infected with *Theileria* were pyrexia (40.5–41.5°C), slight nasal discharges, enlargement of superficial lymph nodes, salivation, decreased milk yield, and respiratory distress. Anorexia could be due to persistent fever; furthermore the enlargement of superficial lymph nodes may be due to hyperplasia of lymph nodes that occurs in early stages of disease. Clinical signs of weakness, bilateral nasal discharge, fever, pale mucous membrane and increased respiration rate were also observed during this study. These clinical findings were also observed in crossbred calves and Friesian cattle by<sup>12,13</sup>. The results of the hematological investigation in cattle suffering from thelariosis revealed significant reduction in erythrocytic count, haemoglobin content, packed cell volume % in theileriosis there, increase in MCV and decrease in MCHC table(1).

**Table (1): effected of theileriosis on some hematological parameters:**

Hematological parameters	Control animals	Infected animals
RBC	7.3000±0.6356	3.7333±0.80911**
WBC	8.9167±0.84479	5.5833±0.60470**
NEU	26.8333±1.47196	20.3333±1.63299**
LYM	63.1667±1.47196	77.4833±4.01020**
MCHC	35.1667±1.9407	25.4000±1.5231**
MCH	16.6667±1.21106	10.8333±1.47196**
MCV	50.1667±2.3166	60.333±3.0767**
PCV	36.1667±2.786	23.666±2.7325**
HB	12.766±1.233	6.4833±0.9152**

These results were identical to that recorded formerly [14] in cattle. Also, [15] mentioned that protozoan intra-erythrocytic parasites induced lyses of the infected RBC, which resulting in severe clinical symptoms, such as anemia, fever, and hematuria. Theileriosis induced general anemia with fall in total erythrocytic count, packed cell volume% and hemoglobin content<sup>16,17</sup>. Our observations were in accordance with those documented previously<sup>12,18,19</sup> stated that Theileria induces significant decrease in packed cell volume, total erythrocytic count and hemoglobin content. Besides, theileria in calves induced macrocytic hypochromic anaemia<sup>20</sup>. This might be attributed to the toxic metabolites of theileria species which have harmful effect on bone marrow and interfere with the process of erythropoiesis<sup>21</sup>. In the present study, it has been shown that bovine theileriosis evoked leukopenia, neutropenia and eosinopenia accompanied with lymphocytosis, monocytosis and basophilia compared to that of control group. Our results of treatment with 1-buparvaquone are in accordance with the finding of<sup>22</sup> who showed 93% curative rate of buparvaquone in tropical theileriosis. Likewise Zahid *et al*<sup>23</sup> showed 100% curative rate and 81.73 % recovery rate showed by Qayyum *et al.*<sup>24</sup> the results revealed that buparvaquone (Butalex) was effective in treating cases suffering from acute theileriosis. However, oxytetracycline and Butalex were effective in treating cases with chronic theileriosis table (2).

**Table(2): Treatment of thelaria infection with both used drugs**

Hematological parameters	Treatment with Butalex and oxytetracycline	Treatment with Butalex
RBC	7.6500±0.45935	6.6833±0.52694
WBC	9.0000±0.76420	7.6000±0.4427
NEU	27.8333±1.47196	28.5000±1.04881
LYM	63.5000±1.3784	61.1667±1.1690
MCHC	36.666±1.63299	33.666±1.3662
MCH	17.6667±1.2110	15.5000±1.0488
MCV	51.333±1.7511	52.2917±5.3930
PCV	34.667±1.7511	31.1667±1.9407
HB	13.1500±0.8757	11.450±0.6024

Low efficacy of buparvaquone in the treated infected cattle may be attributed to a failure to control the respiratory lesion, possibly due to damage or bacterial infection to the lungs. Similar results were reported by<sup>25</sup>.

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