

قسم طب الحيوان  
كلية الطب البيطري - جامعة أسيوط  
رئيس القسم : د/ ابراهيم سيد أحمد \*

## دراسة على مرض الثيليريا في أبقار الفريزيان في صعيد مصر

أحمد عامر ، مراد اسماعيل ، حمدي سالم \*

تم دراسة ٤٦ حالة إصابة من ١٥٦ في أبقار الفريزيان بمرض الثيليريا مع تطبيق خطة للعلاج . كذلك تم تحليل عينات من مصل الدم لهذه العينات معمليا لمعرفة مدى تأثير هذا المرض على محتويات مصل الدم من نشاط أنزيمات الاسبرتيت أمينوترانزفيريز والألانين أمينوترانزفيريز وكذلك البروتين الكلبي والبليروبين وقد ثبت أن مستوى هذه المكونات قبل العلاج يشير الى وجود خلل في وظائف الكبد الذي عاد لوضعه الطبيعي بعد العلاج ب ٣٠ يوما . أما الدراسة الهستوباثولوجية لعينات من جثث الحيوانات النافقة فأوضحت وجود صفراء الكبد التسممي واوديميا وربو تعويضي في الرئتين وكذلك تحلل خلايا الكلية مع وجود بقع من ارتشاحات بين النسيج الضام للكلية واحتقان دموي للغدد الليمفاوية .

Dept. of Animal Medicine,  
Faculty of Vet. Med., Assiut University,  
Head of Dept. Prof. Dr. I.S. Abdallah.

**THEILERIASIS IN FRESIAN CATTLE IN UPPER EGYPT**  
(With One Table and 5 Plates)

By  
**A.A. AMER, M.I. MOURD and H.A. SALEM\***  
(Received at 29/11/1986)

**SUMMARY**

*Theileria annulata* infection was detected in 46 Fresian cows. Treatment measures were adopted. Serum samples were analysed before and 30 days after treatment for serum aspartate aminotransferase (S-G.O.T), serum alanine aminotransferase (S-G.P.T), total proteins and total bilirubin. Pretreatment levels of studied indices revealed liver function impairment that have been restored at the 30<sup>th</sup> day following treatment.

Histopathological examination to parenchymatous organs of dead animals showed hepatic toxic jaundice, inflammatory oedema with compensatory emphysema of lungs, degenerative nephrosis with focal areas of inflammatory oedema in the interstitial tissues of the kidneys. Congestion of lymph nodes was evident.

**INTRODUCTION**

*Theileria* are blood parasites which multiply by schizogony in the lymphoid tissues of infected animals and finally invade the red blood corpuscles, where they are seen as rod-like, round, oval or irregular forms. In the acute stage of the disease, parasites are very numerous as many as 70% of R.B.Cs being invaded. Schizonts or Koch's blue bodies are usually confined to the cytoplasm of the cells of lymphatic glands, spleen, liver, kidneys, bone marrow and intestinal mucosa (DAVIES, 1962). Cattle is infested naturally by the parasites through *Hyalomma* species. The disease is manifested clinically by pyrexia, weakness, swelling of the superficial lymph nodes, tarry faecal material, rise of body temperature, lacrimation (DAVIES, 1962; JAGDISH *et al.*, 1979). Demonstration of the infected blood film stained with Giemsa stain is diagnostic for the disease (Coles, 1980).

SHLOSBERG *et al.*, (1973); HOOSHMAND, (1976); BANSAL and GAUR (1977); DHAR and GAUTAM, (1979) and MAXIE *et al.*, (1982), demonstrated the effect of the disease on blood elements of infected cattle including total proteins, bilirubin, S- G.O.T. and S- G.P.T.

The aim of this work was to describe the clinical, P.M. and histopathological picture of naturally infected Fresian cattle with *Theileria annulata*, beside studying the effect of the disease on total blood serum proteins, bilirubin, S- G.O.T.; S- G.P.T. Evaluation of the results of an applied scheme for treatment and control to the disease in fresian cattle in Upper Egypt.

---

\* : Head of Dept. of Pathology, Fac. of Vet. Med., Assiut University.

A.A. AMER, et al.**MATERIAL and METHODS**

- A total number of 46 infected Friesian Cows (2-3 years age) with *Theileria annulata* among two farms containing 159 cattle at El-Minia and Quena Provinces. At El-Minia province, 26 Cow were infected out of 59 and at Ovena province, 20 infected Cows out of 100 Cattle. The animals proved healthy to the disease were used as a control for the study. The case begins from April to August, 1985.
- For each animal the clinical signs, blood films stained with Giemsa stain (Coles, 1980), lymph smears were used in diagnosing.
- Three dead animals were used for illustration of the P.M. picture and histopathological changes in lung, liver, kidneys and lymph nodes.
- Each infected animal was treated by S/C injection of 3 ml. Acaprine, 5 ml Adeco-pherine for 5 successive days; I.M. injection day after day of 10 mg/Kg b.wt. oxytetracycline for 30 days and 20 ml catosal as a tonic daily for 10 successive days.
- 0.1% Diazinone was sprayed to all animals and stables to eradicate ticks (3 successive sprays at 21 days interval). Quarantine measures to the farms were applied.
- Serum samples were obtained pre and 30 days post treatment from infected and 15 healthy animals for studying S-G.O.T.; S-G.P.T.; total proteins and total bilirubin using standard kits supplied by Boehringer, W. Germany.

**RESULTS**

Clinically the infected animals showed general weakness, inappetance, rise of body temperature up to 41°C, tarry defecation, grinding on teeth, restless, laboured respiration, salivation, enlarged superficial lymph nodes, lacrimation and strong quick heart beats. Infected animals showed pale to icteric mucous membranes. Thick blood films stained with fresh prepared Giemsa stain revealed about 70% infectivity of R.B.Cs with *T. annulata* (photos No. 1,2). Lymph mears showed presence of Koch's blue bodies.

Postmortum examination of the dead 3 animals out of 46 infected cattle (6.54%) revealed icterus, congested liver and spleen, enlarged lymph nodes, filled and enlarged gall bladder.

Histopathological picture showed hepatic toxic jaundice, inflammatory oedema with compensatory emphysema of the lungs (photo.no. 3), degenerative nephrosis with focal areas of inflammatory oedema in the interstitial tissues of the kidneys (photos no, 4,5). Congestion of lymph nodes was evident.

30 days post treatment of infected cases and applying quarantine, hygienic measures, control, the diseased condition showed healthy insurance which was ensued by disappearance of abnormal clinical signs mentioned before, negative blood and lymph smears for the parasites and Koch's blue bodies with no new diseased or dead cases occurred. Hyalomma species were disappeared.

Table (1) revealed changes in serum constituents of diseased cattle pre and 30 days post treatment. The table showed that infection with *Theileria annulata* was accompanied by elevation of S-G.O.T., S-G.P.T., bilirubinaemia which indicate liver function impairment. Serum total proteins is elevated in diseased animals. Thirty days following beginning of the

### THEILERIASIS IN CATTLE

treatment, S-G.O.T., S-G.P.T. levels were dramatically decreased in comparison with pre-treatment levels. The lowered levels were accompanied with bilirubinaemia. Total proteins levels were insignificantly.

### DISCUSSION

The abnormal clinical signs, P.M. picture observed in this study due to infection of Fresian Cattle with theileriasis, were more or less identical to that reported by DAVIES (1962); JADISH *et al.* (1979), where the presence of the parasite within R.B.Cs. and Koch's blue bodies in lymph smears supported the infection with the disease. The clinical symptoms reported in our study were identical to that reported by GERALD and LARRY, S. (1977) who mentioned that fever firstly appeared and followed by nasal discharge, runny eyes, swollen lymph nodes, diarrhoea, weakness and emaciation. The authors added also that diagnosis of theileriasis depends on finding the parasites in blood or lymph smears.

Mortality rate reached about 6.52% (3 out of 46 infected cattle), this was generally in conformity to the results stated by SOULSBY (1968) who reported that mortality rate due to *Theileria annulata* infection varies from 10% in some areas up to 90% in others.

Using Acaprine, Adecoferine and oxytetracycline drugs for treatment of the disease beside I.M. injection of catosal as general tonics for 10 successive days shared in the well living of infected animals following treatment and proved good results in treatment of cattle theileriasis. This result differs from that reported by GERALD and LAURY (1977), who mentioned that no drugs is known to be effective once symptoms appears, however some of the tetracyclines prevent clinical diseases if given during the incubation period. The author mentioned also that control of the disease depends on ticks control and quarantine rules. The same result was obtained in this study by using 0.1% Diazinone sprays 3 successive times with 21 days intervals to all animals and stables in the farms. Applying quarantine measures to both farms helped in fullfilling the best results. For the same purpose RADKEVICH (1966), used oxy or chlorotetracycline, a mixture of one gm quinuronium, one gm hemosporidin, 2 gm Berenil, 3 gm tetracyclin, 2 gm procain in 100 ml H<sub>2</sub>O for 3 successive days by 5 ml./100 Kgm b.wt. I.M. repeated after 5-6 days using cardiac stimulent, trace elements. The author obtained 89.4% recovery.

Table (1) shows changes in some serum constituents of diseased cows before and 30 days after 30 treatment. Analysis of obtained data revealed that infection with *Theileria annulata* in Fresian Cows was accompanied by hypertraminasaemia. Serum-G.O.T. level reached  $52.50 \pm 18.20$  U/L. and S-G.P.T. level constituted  $10.57 \pm 4.60$  U/L. These enzymes are used by many authors to asses liver function in ruminants, especially with regard to S-G.P.T. Therefore increased S-G.O.T. and S-G.P.T. observed in investigated animals is indicative for liver function impairment. This fact was emphasised by SHLOSBERG *et al.* (1973), who observe that rise in S-G.O.T. in splenectomised calves infected with *T. annulata* was a constant finding at time of peak temperature. Eelevated level of total serum bilirubin in infected cows was another prove of liver function impairment ( $0.15 \pm 0.07$  mg%). HOOSHMAND-RAD (1976); BANSAL and GAUR (1977) and LAIBLIN *et al.* (1978), were in the opinion that bovine theileriasis is accompanied by hyperbilirubinaemia indicating severe liver damage. With regard to serum total proteins, recorded levels in diseased Cows reached  $9.4 \pm 1.4$  gm/100 ml., a level which is higher than those recorded in normal cattle ( $7.56 \pm 0.5$  gm/100 ml). DAHR and GAUTAM (1979), on the contrary, observed hypoproteinaemia in the acute and chronic types of bovine theileriasis.

A.A. AMER, et al.

Thirty days following treatment, serum G.O.T. and G.P.T. levels were dramatically decreased in comparison with pretreatment levels ( $14.00 \pm 3.40$  and  $1.50 \pm 0.11$  U/L respectively). These lowered levels, in accompany with hypobilirubinaemia ( $0.12 \pm 0.01$  mg%) proved the assessment of normal liver function with regard to serum total proteins, recorded levels, following treatment, were insignificantly lowered ( $8.9 \pm 1.1$  gm%) in comparison to the pre-treatment ones ( $9.4 \pm 1.4$  gm/100 ml). As a conclusion bovine theileriasis, based on studied indices, was accompanied by impairment of liver function. Application of specific antiprotozoal drugs with supportive treatment restored the normal liver function.

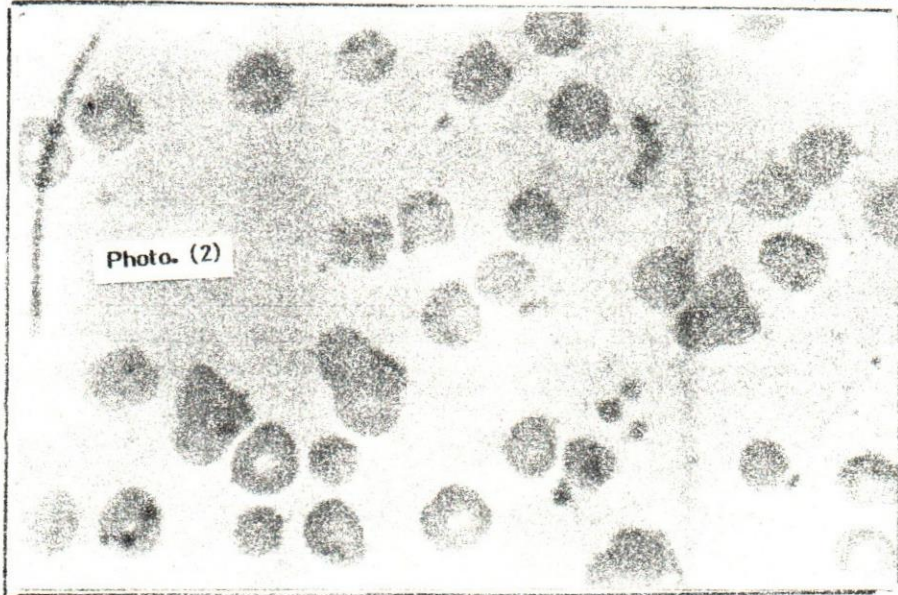
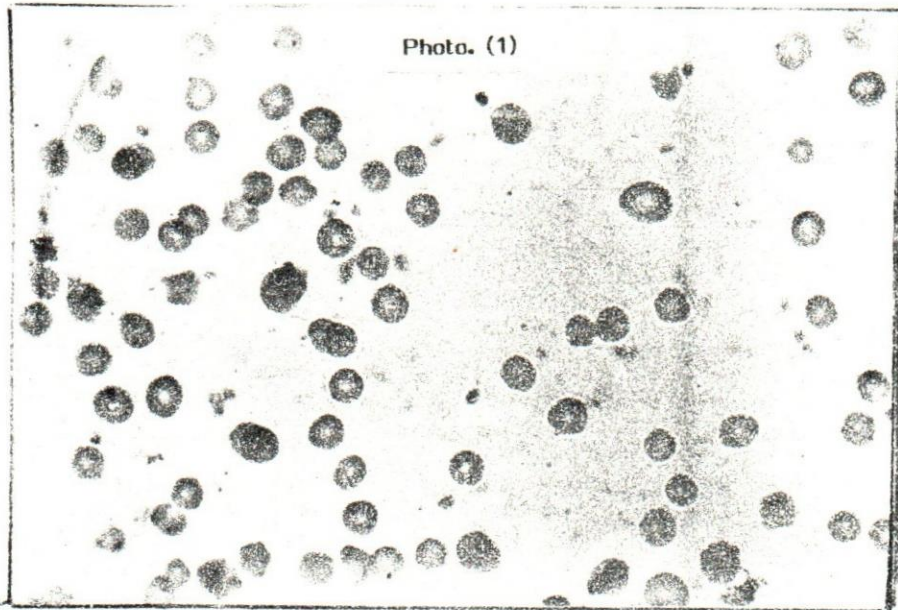
## REFERENCES

- Bansal, G.C. and Gaur, S.N.S. (1977): Note on biochemical changes in experimental bovine theileriasis. *Pantnagar J. of Research*, 2, 2, 222.
- Coles, E.H. (1980): *Vet. Clinical Pathology 3rd Edition* W.B. Saunders Company. Philadelphia. London.
- Dahr, S. and Gantam, O.P. (1979): Serum protein in experimental *Theileria annulata* infection of cattle. *Indian Vet.J. of Animal, Sci.* 49, 511-516.
- Davies, G.O. (1962): *Vet.Path. and Bacteriology 4th Ed.* Bailliere, Tindall and Cox. London.
- Gerald, D.S. and Larry, S.R. (1977): *Foundations of parasitology, 1st Ed.* page, 166. C.V. Mosby Company Saint Louis.
- Hedge, K.S.; Rahman, S.A. and Wajid, U.R.A. (1971): Treatment of theileriasis in cattle with Nivaquine *Kajian Neterinaire*, 3,2, 77-82.
- Hooshmand. R.P. (1976): The pathogenesis of anaemia in *Theileria annulata* infection. *Res. Ind. Vet. Sci.* 20, 324-392.
- Jagdish, S.; Sing, D.K.; Gautam, O.P. and Dhar, S. (1979): Chemoprophylactic immunization against bovine tropical theileriasis. *Vet. Rec.* 104, 140-142.
- Laiblin, C.; Baysu, V. and Müller, M. (1978): Clinical studies of cattle experimentally infected with *T. annulata* I. Clinico-chemical studies. *Berliner and Münchener Tierärztliche Wochenschrift*, 91, 25-27.
- Maxie, M.G.; Dolan, T.T.; Jura, W.G.Z.; Tabel, H. and Flowers, M.J. (1982): A comparative study of the disease in cattle caused by *T. parva* or *T. Lawrencei*. II. Haematology, clinical chemistry, coagulation studies and complement. *Vet. parasitology* 10, 1-19.
- Radkovich, P.E. (1966): Pharmacotherapy of *T. annulata* infection in cattle. *Dokl. Vnes. Akad. Sel'khor Nauk.* 7, 41-42.
- Shlosberg, A.; Bogin, E.; Pipano, E. and Klinger, I. (1973): Serum enzyme levels in experimental theileriasis in calves. *Refauh, Veterinarith* 30, 1, 24-27.
- Soulsby, E.J.L. (1968): *Helminths Arthropods and protozoa of Domesticated animals 6th Ed.* 724, Bailliere, Tindall, Cassell, London.

Table (1)

Blood serum changes before and 30 days after treatment of *T. annulata* in Fresian Cattle

	Time of sampling		Control
	Before treatment	30-days post treatment	
S-G.O.T. (U/L)	$52.50 \pm 18.20$	$14.00 \pm 3.400$	$13.00 \pm 2.20$
S-G.P.T.	$10.57 \pm 4.60$	$1.50 \pm 0.11$	$1.50 \pm 0.18$
T.S.P. (gm%)	$9.40 \pm 1.40$	$8.90 \pm 1.10$	$7.56 \pm 0.50$
T.S.B. (mg%)	$0.15 \pm 0.07$	$0.12 \pm 0.01$	$0.20 \pm 0.71$



Photos. no. 1,2: *Theileria annulata* within R.B.Cs. of infected cattle.

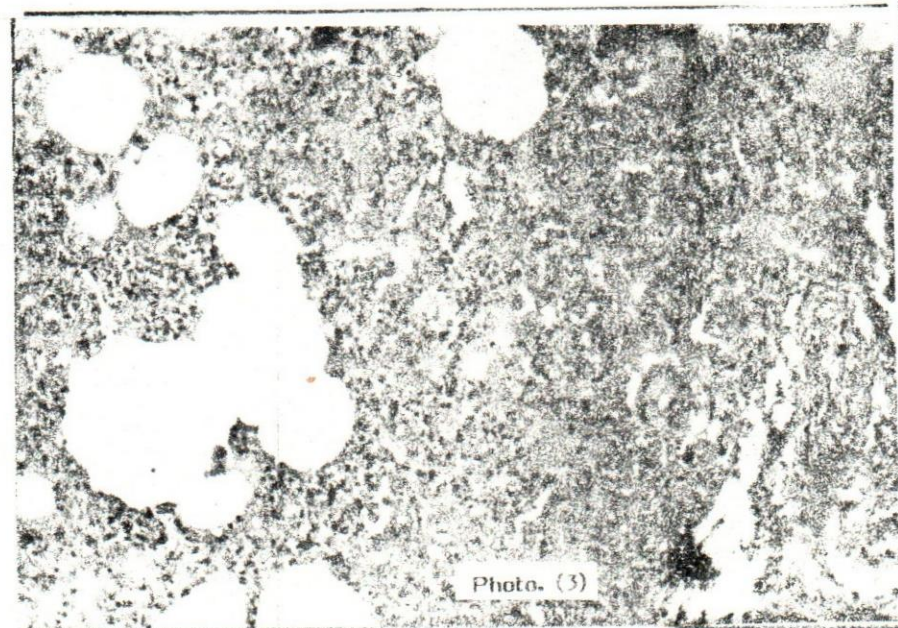
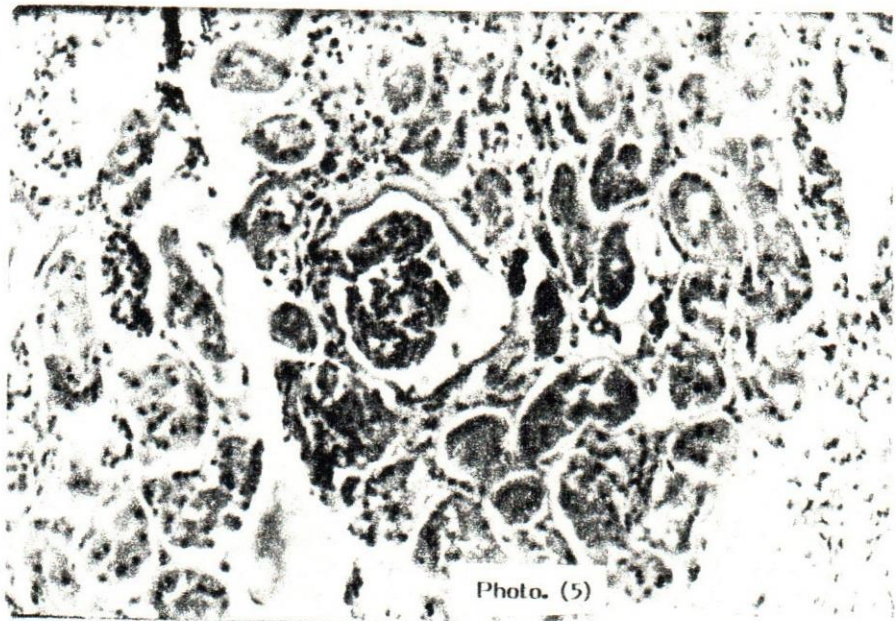
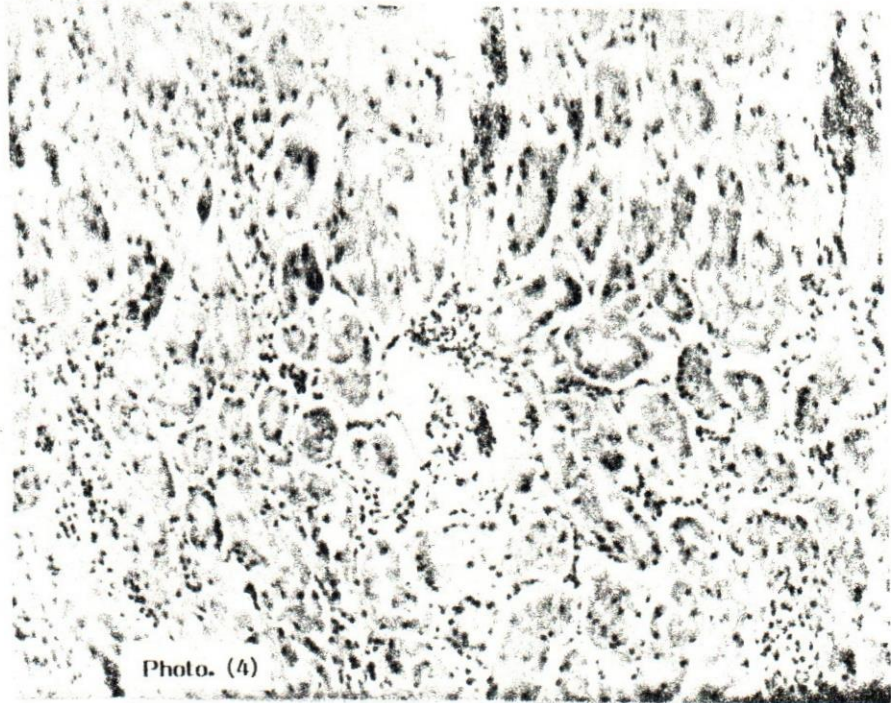


Photo no. 3: Oedema and compensatory emphysema of lungs in cattle infected with *T. annulata*.



Photos. no 4,5: Degenerative nephrosis with focal area of inflammatory oedema in interstitial tissues of the kidneys of infected cattle.