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INVESTIGATION ON PHOTOSENSITIZATION PROBLEM IN LACTATING CATTLE AT QENA PROVINCE (With 4 Tables & 3 Figs.)

By

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دراسة عن التخليق الضوئي في الأبقار الحلوب
بمحافظة قنا

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أجريت هذه الدراسة على عدد ٤٥ بقرة فريزيان حلوب تراوحت أعمارها ما بين ٧ - ٩ سنوات فحصت إكلينيكيًا وأثبت الفحص الأكلينيكي وجود حساسية في الجلد نتيجة وجود طفيل الإسكارس المعوي كما تم علاج الحيوانات المصابة وذلك إعطائها جرعة طارد للديدان وحقنها بفيتامين أ 3×10^6 - والأملاح المعدنية وتم علاج أعراض الحساسية الجلدية بدهان الأجزاء المصابة بالجلد بمرهم يحتوى على مضاد للحساسية وقد إستجابت جميع الحيوانات المصابة للعلاج وتمثلت للشفاء . وأوضحت الصورة الدموية وجود أنيميا في الحيوانات المصابة مع وجود زيادة في الخلايا الحمضية كما أوضحت التحليل البيوكيميائي عن وجود نقص في البروتين الكلى والالبومين في الحيوانات المصابة بالمقارنة بالسليمة كما أن هناك وجود فروق بين نسبة الصوديوم والبوتاسيوم ونسبة الكلوريد ولكنها في المعدل الطبيعي المسموح به .

SUMMARY

Out of total number, 45 Holstein - Freisian lactating Cows aged ranged from 7-9 years - were choised in this investigation. The study described clinical signs of photosensitization, its causative agent and the relation between this condition and some selected blood indices. Parasitological examination revealed the presences of Ascaris eggs in both faeces and stable ground.

Animals were treated using a lotion containg antiallergic substance with injection the animals with AD_3 E I/M besides the antiparastic drugs and mineral mixture.

The study revealed oligocythaemia with esinophilia were evident in diseased animals meanwhile the biochemical analysis revealed a hypoproteinaemia associated with hypo-albuminaemia. There was a slight variations regarding blood serum electrolytes however these variations were within the normal values.

T.H.S. ABDEL ALL, et al.**INTRODUCTION**

Photosensitization is the development of increased reactivity of skin to sunlight. Dermatitis is the end result and is caused by the action of a phototoxic material on animals skin. Non pigmented Sparsely haired parts of the integument directly exposed to light are the most severely affected. Eyes, udder, teats, muzzle, valva and lightly pigmented skin areas are the main sites in cattle (CASTEEL, et al. 1986). Dermatologic lesions vary from mild erythema to edema, vesiculation, necrosis and sloughing of unpigmented exposed skin.

Photosensitization can be classified as Primary, secondary or congenital in nature (CLARE, 1955).

Primary photosensitization occurs when an animal is exposed to a photodynamic substance such as drug or a phototoxin. Ingestion of these agents or by dermal contact they reacts directly with light and causing cellular damage. Secondary photosensitization (hepatogenous) is considered by CASTEEL, et al. (1986) the most common type in ruminants. This type occurs when substances that are normally eliminated from the body are retained because of hepatocellular damage or liver malfunction for whatever reason result in phyloerythrin reaching peripheral circulation and inducing photosensitization reaction. Mechanical obstruction of the common bile duct has also been claimed in photosensitization (JOHNS and HUNT, 1983). In either case, the degree of photosensitization reflects the inability of the liver to detoxify inciting agents.

Congenital porphyria results from a metabolic defect in porphyrin metabolism. This type of photosensitivity is not associated with plants. (MARTIN and MORGAN, 1987).

In this paper, we report a case of photosensitization in freisian cows suffering from heavy infestation of gastrointestinal parasites.

The aim of the study is to declare the causative agent of photosensitization beside the effect of treatment to overcome the problem.

MATERIAL and METHODS

A total number of 45 freisian lactating cows of 7-9 years age were included in the present investigation. Animals were imported at 1981 from Holland. Since that time animals were reared at Gena Governorate Development project. Over 600 Km. South Cairo. Opened house system is choiced for housing where a central metal shade occupies the centre of the cow's house. Ration and water is offered to animals at the periphery of the animals house away from the shade. Environmental temperature at summer season ranged 37-39°C at 7 a.m. and maximum temperature 45°C at mid day while at 8 p.m. the temperature ranged between 38-40°C. Relative humidity at respective time were 50-60%. Daily ration consisted of 8-10 kgs concentrated ration given at 8 clock A.M. Barseem is offered to Cows at 10 a.m. to 12 a.m. daily while

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rice straw and water was ad lib. Lesions appeared in 15 animals. Non pigmented body surface areas (on both sides of body, at skin fold in front of hip joint, at tips of ear) are sites of changes. These areas exhibited, loss of hair, hyperaemia and mild oedema. Two Blood samples from both diseased and healthy cows were collected from each animals through jugular vein. First sample was drained on "E.D.T.A." Ethylene diamine tetracetic acid, as anticoagulant for haematological studies.

Total leucocytic count (T.W.Bcs - G/L), total erythrocytic count (T.R.B.Cs - T/L), Packed cell volum (Pcv %) Haemoglobin content (HB gm/L), differential leucocytic count (DLC %), MCHC % and MCV (U^3) were calculated mathematically.

The technique for collecting blood samples and its examination were determined as by COLFS (1986).

Second samples were collected without addition of anticoagulant left to coagulate then centrifugated at 3000 r.p.m. to obtain serum. The obtained cleared sera were analysed biochemically for total protein, Albumin, Using test kits* and after the method of WICHSELBAUM, 1946 and DRUPTF, 1974; Respectavely. (A/G) ratio were determined methematically. Serum sodium and potassium were analysed using corning 400 Flamphotometer. While chloride level was determined using Chlorid meter model, 925.

Parasitological examination:

1- Faecal sample were obtained from the animals for parasitological examination according to (BENBROOK and SLOSS, 1955).

2- Skin scraping were obtained from the lesions for studying the bacteriological mycological and parasitoloical agents. Another aseptic skin scraping were culturing on Nutrient broth, as enrichment media, then subcultur on blood agar MocConkey agar plates, in trails to isolate the present of bacteria and their identification (CRUICKSHANK, et al. 1974. Both food matter and soil samples were also examined bacteriologically and mycologically. The scraping were cultured on Sabaroud dextrose agar to which chloramephenical and actedion were added for isolation of pathogenic dermatophytes.

The following line of treatment was applied. The diseased animals were treated by:

1- Topical application of antiallergic ointements applied twice daily (at 8 a.m and 6 p.m) on the reddened areas Turelin (Vitamin AD₃E) was injected daily 1/m (10-20 ml) for 10 day and Dextrose solution 1/V.

2- Banmenth 10 gm/kg body weight orally as twice with 15 days interval for treatment of gastro intestinal nematode parasites.

Animals were removed to a rather shade housing place Green fodder was with held for the first ten days and after on the amount of it was decreased to half of the normal amount. Rice straw was given as in normal quantities. Concentrated ration was also fixed.

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The above mentioned treatment was applied beside the attention to disinfection of the shade house against parasites.

Statistical analysis of data were performed according to the method of SNEDECOR and COCHRAN, (1967). Using T-test.

RESULTS

The mean value of the haemogram picture and biochemical parameter were illustrated in tables I, II, III and IV & 3 Figs.

Parasitological examination revealed the presences of gastro-intestinal nematodes (*Ascaris* spp.). Total egg count in diseased animals were 300-500 egg/gm. While the healthy animals amounted from 0-50 egg/gm.

Both bacteriological and mycological examination showed negative results for bacteria and dermatophytes.

DISCUSSION

The previous observed clinical signs were in a good agreement with those obtained in the same condition by CASTEEL, et al. 1986. Haemogram picture revealed oligocythemia associated with eosinophilia in diseased animal if compared with the healthy ones. This can be attributed to the degree of infestation (COLES, 1986).

There is non significant variation between total leucocytic count, haemoglobin concentration and packed cell volume in healthy and diseased animals. The obtained values agreed with those recorded by COLES (1986) and DUNCAN and PRASSE (1986) in cattle.

Hypoproteinemia associated with hypoalbuminemia were evident in diseased animal if compared with the healthy ones these may be due to the heavy infestation with nematodes and its parasitic toxin which interfere with both absorption and synthetization of protein so lead to the liver malfunction and appearance of hepatogenous photosensitization (CASTEEL, et al. 1985).

Mean value of serum, sodium, potassium and chloride levels were coincided with those previously obtained in cattle by BUTLER, et al. (1971); ROSENBERGER (1979) and COLES (1986).

Treated animals showed a great progress after application of the applied treatment and all diseased conditions were returned to the clinical healthy status.

Finally the study declared the influence of effect of gastrointestinal nematodes and its metabolites in aggravation of the problem, also the role of treatment to overcome the condition.

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Table (1)
Haemogramme picture in examined animals before treatment

Condition	T.R.B.Cs	Hb	P.C/V	T.W.B.Cs	M.C.V.	M.C.H.C.	D.L.C.				
							neut	Esin	Bos	Lym	Mono
Diseased	6.23 \pm 1.3*	116 \pm 19.5	25.2 \pm 1.9	7.92 \pm 1.15	42.22 \pm 9.4	47.1 \pm 5.03	34 \pm 12.8	7.4 \pm 1.6*	0 \pm 0	58.2 \pm 12.4	3.6 \pm 0.02
Healthy	8.16 \pm 0.53	113.75 \pm 31.9	25.75 \pm 2.6	6.85 \pm 1.01	31.9 \pm 3.3	44.0 \pm 10.4	27 \pm 4.8	3.0 \pm 2.6	0.25 \pm 6.05	65.5 \pm 5.7	3.75 \pm 0.1

Table (2)
Mean values of serum parameters of examined animals before treatment

Condition	Total protein gm %	Albumin gm %	Globulin gm %	A/G	Sodium mmol/L	Potassium mmol/L	Chloride mmol/L
Diseased	4.68 \pm 0.96**	2.46 \pm 0.65*	2.29 \pm 0.65	1.17 \pm 0.49	133.02 \pm 6.94*	5.26 \pm 0.73	110.8 \pm 7.79
Healthy	7.77 \pm 0.67	4.99 \pm 0.56	2.78 \pm 0.48	1.84 \pm 0.4	155.4 \pm 18.9	6.72 \pm 0.62	122.6 \pm 6.8

* : Significant (P/0.05)

** : Highly significant (P/0.01).

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Table (3)
Haemogram picture of examined animals after treatment

Condition	T.R.B.Cs T/L	Hb gm/L	P.C.V. %	T.W.B.Cs G/L	M.C.V. 3U	M.C.H.C	D.L.C.				
							neut	esin	Bas. lym mono		
Diseased	5.9 \pm 0.21	115.9 \pm 0.5	26.1 \pm 0.9	8.3 \pm 1.2	44.2 \pm 3.2	44.4 \pm 1.8	28.0 \pm 0.1	3 \pm 0.8	-	66.9 \pm 3.3	2.1 \pm 0.2
Healthy	6.93 \pm 0.17	114.3 \pm 0.4	25.9 \pm 0.8	7.1 \pm 1.9	37.4 \pm 5.3	44.1 \pm 2.7	31 \pm 0.9	3.2 \pm 0.8	-	62.7 \pm 5.1	3.1 \pm 0.8

Table (4)
Mean values of serum parameters of examined animals after treatment

Condition	Total protein Gm %	Albumin Gm %	Globulin Gm %	A/G	Sodium mmol/L	Potassium mmol/L	Chloride mmol/L
Diseased	5.9 \pm 0.5	3.2 \pm 0.1	2.7 \pm 0.67	1.185	125 \pm 11.1	5.9 \pm 1.1	111.3 \pm 1.4
Healthy	6.99 \pm 0.8	4.7 \pm 0.5	2.24 \pm 0.56	2.05	135 \pm 9.8	6.1 \pm 0.9	110 \pm 2.5

