

Dept. Anim. Med.,
 Fac. Vet. Med., Assiut Univ.
 Head of Dept. Prof. Dr. M.F. Raghib

**EFFECT OF *DICTYOCAULUS FILARIA*
 AND SOME PARASITIC INFESTATION
 IN SHEEP ON CLINICAL, HEMATOLOGICAL
 AND SEROLOGICAL FINDINGS**
 (With 4 Tables)

By

**M.N. ABD-EL-SALAM; H.S. ALI; M.I. MOURAD
 A.A. DAKKA* and A.M. ZAITOUN**
 (Received at 20/6/1992)

تأثير الإصابة بديدان الديكتيوكولاس فيلاريا وبعض الطفيليات
 الأخرى في الأغنام على بعض المؤشرات الإكلينيكية والدموية والصلوية

محمد عبد السلام ، حلمي علي ، مراد إسماعيل ، عدنان الدقنة ،
 أحمد زيتون

تمت هذه الدراسة على قطيع من الأغنام مصابة بديدان ديكتيوكولاس فيلاريا (الديدان السلكية) حيث أخضعت هذه الأغنام لفحوصات إكلينيكية وتحاليل مخبرية للكشف عن الطفيليات والتغيرات الدموية والصلوية (السيرولوجية) ومن أجل المقارنة فقد فحصت عدة أغنام من نفس القطيع كانت سليمة ظاهريا وأعتبرت على أنها شامدة (كونترول) وقد أظهر الفحص السريري وجود اجهاد تنفسي مصحوب بسعال شديد وسيلان أنفي لزج مزدوج من كلا فتحتي الأنف . كما دلت الفحوص المخبرية على أن عشرة أغنام التي أخضعت للفحص كانت إيجابية للإصابة بالديدان السلكية (ديكتيوكولاس فيلاريا) مع إصابة متوسطة ببعض الطفيليات المعوية . كما دلت الفحوص العملية حدوث زيادة في عدد الخلايا الحمضية (ايزينوفيل) مع زيادة في مستوى تركيز الجلوبيولين في مصل الأغنام المصابة . هذا وقد ارتبطت شدة العلامات الإكلينيكية مع التغيرات في طرد هذه الطفيليات مع البراز خارج الجسم وكانت الزيادة النسبية في عدد الخلايا الحمضية (ايزينوفيل) في مجموعة الأغنام المصابة بالطفيليات الرئوية دلالة على هذه الإصابة . وبالإضافة إلى ذلك فإن ارتفاع مستوى تركيز الجلوبيولين في المصل إنعكس على إستجابة الجهاز المناعي تجاه الإصابة بالديدان الرئوية .

SUMMARY

A flock of sheep infested with *D. Filaria* were examined clinically, parasitologically, hematologically and serologically against clinically healthy sheep. Clinical examination revealed the present of respiratory

*: Prof. & Head of Dept. of Vet. Med. Al- Baath Univ. S.Y.R. (Visiting Prof. at Dept. of Vet. Med., Fac. Vet. Med., Assiut University, Assiut , EGYPT.

M.N. ABD-EL-SALAM *et al.*

distress with strong cough and bilateral tenacious nasal discharge. Ten sheep were positive for lungworm infection with *D. Filaria* with mild intestinal parasitic infestation. An increase in the number of eosinophiles and in the concentration of blood serum globulines level were noted in the diseased group. The intensity of clinical signs were correlated with the changes of elimination of lungworm larvae in faeces. The relative increase in eosinophiles of diseased group was considered indicative for lungworm infestation. In addition the increased level of seum globulines concentration reflect the response of immune system against the lungworm infestation.

INTRODUCTION

The effect of parasites on the host were summarized by MILLER (1968) as follows: They damage the host's tissues, reduce their absorptive capability; share in absorbing the host's food; suck the host's blood and tissue fluids; causes mechanical obstruction of blood and lymphatic vessels or vital channels; cause wounds through which other antagonistic organisms can enter; and lastly secrete or excrete into the host various harmful substances such as hemolytic and digestive enzymes, possibly anti-enzymes and anti-coagulents. SOLIMAN and FARID (1960) recorded an outbreak of parasitic broncho-pneumonia in a flock of imported texel sheep in Egypt caused mainly by *Muellerius Capillaris* and accompanied with *Dictyocaulus filaria* infection in one of the investigated sheep. However *D. Filaria* was the most common lung worm encountered in sheep with parasitic infestation in Iraq (ALTAEIF, 1969). The author observed that the disease appeared irregularly and sometimes in heavy outbreaks. The aim of the present investigation was to study hematologic and serologic changes that can occur in sheep's blood and serum during the infection with *D. Filaria*, the clinical findings of the disease were also reported.

MATERIAL and METHODS

Examined Animals

A flock consists of 30 balady sheep of different ages and sexes were examined. The diseased sheep were presented to the Veterinary Clinic Faculty of Veterinary Medicine, Assiut University with a case history of respiratory distress, strong cough and death of five animals. Ten clinically healthy sheep after insuring absence of parasitic infestation were used as control (Gr. II).

Samples

Faecal, whole blood and blood serum samples were collected from both groups.

Faecal Examinations

Faecal samples were prepared according to the usual technique adopted for examination and detection of parasites and counting of eggs was done using stool

DFILARIA IN SHEEP

dilution egg counting technic (COLES, 1980).

Haematological Examinations:

Total erythrocytes (RBCs) and leucocytes (WBCs) count per cubic mm blood and Haemoglobin contents in percent (Hb %) were determined using electronic blood cell counter (C x 310 Sweden). Packed cell volume (PCV %) was determined using microhaematocrit centrifugation (COLES, 1980). Leucocytic differential count (LDC) of blood film stained with Giemsa stain was also done.

Serological Examination:

Serum electrolytes (Na and K) were estimated using flamephotometer (Coorning, mod.400). Chloride (Cl) was determined by chloride analyser (mod. 925).

Serum total protein and albumin were estimated using testkits supplied by bioMerieux, Bains. France after the method of HENRY (1964).

RESULTS

Clinical examination of diseased animals (Gr. I) revealed strong cough, bilateral tenacious nasal discharge. Some animals showed frothy nasal discharge tinged with blood, deep abdominal respiration, respiratory dyspnea, increased vesicular and heart sounds, normal temperature and slight congested nasal mucous membrane.

Faecal examination for detection of lungworm revealed 10 positive cases to D. Filaria larvae (Gr. I) and negative results from control healthy (Gr. II). Intestinal parasitic infestation (1000 egg/gm) with Trichuris ovis, Hoemonchus controtus and Ascaris sp. was also noted in group I.

Results of hematological study in selective 10 diseased sheep and healthy control samples are summarised in tables 1 and 2.

Serum analysis for Na, K, Cl, total protein, and albumin in 10 positive infested and healthy control samples are summarised in tables 3 and 4.

DISCUSSION

The hematological studies as shown in tables 1 and 2 indicated no changes in total RBC's and WBC's; Hb and PCV between diseased and healthy sheep. However leucocytic differential count elicited an elevation in the number of eosinophils in diseased than healthy control group. This can explain the value of LDC than other blood parameters in this respect. In addition the relative eosinophilia in group I together with the respiratory disorders was diagnostic for parasitic pneumonia. The relative increase in the eosinophiles in the diseased group came in agreement with the findings of SOLIMAN and FARID (1960). The increase in number of eosinophiles was correlated with the intensity of individual clinical signs of bovine lungworm infestation. this agreed with the findings of LEKEUX et al. (1985).

M.N. ABD-EL-SALAM et al.

Serum analysis as shown in tables 3 and 4 revealed no changes between diseased and healthy groups in the levels of Na, K, & Cl. This discuss the mild degree of mixed parasitic infestation in diseased group, where the body can compensate the loss in serum electrolytes evoked and discuss the limited value of analysis of serum electrolytes in lungworm infestation. These findings agreed with those of EVANS et al. (1963) who showed that infestation with Haemonchus contortus in sheep resulted in no great changes in plasma Na and K levels.

There were also no significant changes in the levels of serum total protein and albumin although a relative increase in serum globulines was noted in the diseased group than in healthy one. The A/G ratio was also with low changes between groups. ANDERSON et al. (1960) and ROSS and TODD (1965) reported that nematodes infestation in particular result in lower blood proteins specially blood albumin. The relative increase in serum globulines in group I can explain the response of body immune system to parasitic infestation through increasing antibody titre. COLES (1980) reported that alterations in gamma globulin usually reflect the response of reticuloendothelial system to antigenic stimulation of the body by foreign material such as bacteria, virus, protozoa or parasites. This stimulation results in an increase in the concentration of gamma globulines. These findings agreed with those of LEKEUX et al. (1985) in experimentally infected calves with D. viviparus.

It can be conclude that if changes of the clinical, hematologic, serologic and parasitologic values of sheep infested with D. Filarai were analyzed, changes in number of eosinophiles appeared first. Furthermore, changes in larval elimination in feces were correlated with the intensity of individual clinical signs and finally the changes in globulines concentration were indicative for the persistent of the infestation.

REFERENCES

- Altaeif, K.I. (1969): Some data concerning the infectivity rate in sheep with helminthes in Iraq. Egyptian Vet. Med. Assoc., Vol. 29, No. 6: 65.
- Anderson, F.L.; D.J. Graff, D.M. Hammond, P.R.; Fitzgerald, J. Parasit., 46: No. 5, 38 (abstr.).
- Coles, E.H. (1980): Veterinary clinical pathology. 4th Ed. W.B. Saunders Company, Philadelphia and London.
- Evans, J.V.; Blunt, M.H. and Southcott, W.H. (1963): Austral. J. Agric. Res., 14: 549.
- Henry, R. (1964): Clinical chemistry - principles and technics. Harper, Row, N. York, 182.
- Lekeux, P.; Hajer, R. and Breukink, H.J. (1985): Longitudinal study of the effects of lungworm infection on bovine pulmonary function. Amer. J. Vet. Res. vol. 46, No. 6: 1392.
- Miller, R.F. (1968): Proc. 21st Annual Pacific Southwest Animal Ind. Conf and 2nd World Conf. On animal Prod. College Park Maryland.
- Ross, J.G. and Todd, J.R. (1965): Biochemical, serological and hematological changes associated with infections of calves with nematode parasite Ostertagia Ostertagi Brit. Vet. J. 121, 6: 55-64.
- Soliman, K.N. and Farid, A. (1960): An outbreak of parasitic bronchopneumonia in a flock of imported sheep. Proc. 1st Ann. Vet. Conger., Cairo, 1960, p. 269.

D.FILARIA IN SHEEPTab. 1 : Hemogram in sheep infested with *D. Filaria* (Gr. I)

No. Samp.	RBCs 10 ⁶	Hb gm%	PCV %	MCV fl	MCH pg	MCHC gm/dl	WBCs 10 ³	Neut. Band	LDC	Eos. Band	Eos. Bas.	Lymph. Mono
1-	12.5	14.7	38.9	31.1	11.8	37.8	8.5	31	2	24	0	33
2-	9.5	14.3	38.7	40.7	15.1	37.9	7.9	31	5	15	0	39
3-	4.6	14.6	38.5	83.7	31.7	37.9	15.2	33	5	18	0	45
4-	12	12.2	38.5	32.1	10.2	31.6	14.9	32	5	12	0	53
5-	8.4	14.3	38.6	46	17.02	37	14.9	31	4	15	0	46
6-	13.2	14.9	38.4	29.1	11.38	38.8	15	32	4	18	0	47
7-	8.7	14.7	38.5	44.3	16.9	38.1	12.5	34	3	17	0	44
8-	14.4	14.0	38.4	26.6	9.7	36.4	10.6	38	2	18	0	46
9-	10.2	17.7	38.5	37.7	17.4	45.9	13.3	33	5	17	0	39
10-	8.8	14.5	38.0	43.2	16.5	38.1	13.5	34	6	13	0	44
X	10.2	14.6	38.5	41.4	15.8	37.9	12.6	32.9	4.1	16.7	0	43.6
SD	2.9	1.3	0.2	16.3	2.0	3.5	2.7	0.67	0.43	1.1	0	1.7

Tab. 2 : Hemogram in clinical healthy sheep (Gr. II)

No. Samp.	RBCs 10 ⁶	Hb gm%	PCV %	MCV fl	MCH pg	MCHC gm/dl	WBCs 10 ³	Neut. Band	LDC	Eos. Band	Eos. Bas.	Lymph. Mono.
1-	9.2	12.8	36	39.1	13.9	35.6	8.8	36	2	7	0	48
2-	10.6	13.8	38	35.9	13.0	36.3	11.2	34	5	3	1	43
3-	8.8	11.6	36	40.9	13.2	32.2	9.2	45	4	5	0	47
4-	11.2	13.8	38	33.9	12.3	36.3	13.4	30	5	6	1	51
5-	10.2	13.8	36	35.3	13.5	38.3	12.6	42	3	5	1	47
6-	8.5	11.2	35	40.7	13.0	32.0	9.6	40	4	7	1	53
7-	9.8	13.2	36	36.7	13.5	36.8	11.4	31	3	4	0	49
8-	12.1	15.2	38	31.4	12.6	40.0	12.2	43	5	5	0	57
9-	10.3	13.4	38	36.9	13.0	35.3	11.2	33	4	6	0	52
10-	8.6	11.5	36	41.9	13.4	31.9	10.2	32	4	5	1	49
X	9.9	13.0	36.7	37.3	13.1	35.5	11.0	36.6	3.9	5.3	0.5	49.6
SD	0.4	0.4	0.4	1.1	0.2	0.9	0.5	1.7	0.3	0.4	0.2	1.2