



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2021; SP-10(12): 352-354

© 2021 TPI

[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 04-10-2021

Accepted: 06-11-2021

## A Hafiz

Department Veterinary Clinical  
Medicine Ethics and  
Jurisprudence, College of  
Veterinary science, AAU,  
Khanapara, Guwahati, Assam,  
India

## DN Kalita

Department Veterinary Clinical  
Medicine Ethics and  
Jurisprudence, College of  
Veterinary science, AAU,  
Khanapara, Guwahati, Assam,  
India

## M Islam

Krishi Vigyan Kendra, Assam  
Agricultural University,  
Darrang, Mangaldai, Assam,  
India

## Corresponding Author

### A Hafiz

Department Veterinary Clinical  
Medicine Ethics and  
Jurisprudence, College of  
Veterinary science, AAU,  
Khanapara, Guwahati, Assam,  
India

## Some haemato-biochemical changes in experimental caprine haemonchosis

A Hafiz, DN Kalita and M Islam

### Abstract

Haematological and biochemical changes in goats experimentally infected with *Haemonchus contortus* were studied. A significant reduction in Hb (g/dl), PCV (%), TEC ( $10^6$  cumm), Lymphocyte (%) Total serum protein (g/dl), albumin (g/dl), Globulin (g/dl) and a gradual increase in TLC ( $10^3$ /cumm), Neutrophil (%), Eosinophil (%), AST (IU/L) and ALT (IU/L) levels at different days of infection, but there was significant difference of the haemato-biochemical values. All the haemato biochemical parameters gradually returned towards normal level in treated group after treatment.

**Keywords:** haemonchosis, haematology, biochemical, goat

### Introduction

Haemonchosis is the most common and serious helminthic disease affecting ruminants of India. It results in retarded growth, reduced productivity, hindered reproductive performances and lowered resistance to diseases [1]. In the present communication, alterations in haematological and serum biochemical profile of goats associated with experimental haemonchosis in goats were studied. Research work conducted in India on experimental haemonchosis of goats [2] and has demonstrated the positive correlation of hypergastrinaemia and elevated level of pepsinogen with the abomasal damage.

Therefore, an attempt was made in the present study to correlate the haemo-biochemical changes in caprine haemonchosis and its probable use as a tool in early diagnosis.

### Materials and Methods

#### Source of experimental animals and their management

A total of 30 goats aged between 6 months to 3 years of age irrespective of sex were taken for the experimental study. The goats were screened for haemo-protozoans along with other endo and ecto-parasites. All the animals, irrespective of presence of infection, were treated with broad spectrum anthelmintic (Ivermectin @200µg/kg body weight subcutaneously) twice at 10 days interval for internal parasites and 12.5% amitraz through external application. After 1 month, post-treatment, all the animals except healthy control group were exposed to *Haemonchus contortus*.

#### Source of infective larvae (L<sub>3</sub>)

Twenty four experimental goats were exposed to *Haemonchus contortus* infection by oral dosing with larval culture containing approximately 5000 infective larvae [3]. Six goats were kept as healthy control group.

#### Haematological assay

Haemoglobin was estimated from anticoagulated blood by standard Sahli's acid haematin method as described by Baker *et al.* (1965) [4].

The Packed Cell Volume (PCV %), Total Erythrocyte Count (TEC  $10^6$ /cumm), Total Leucocytic Count (TLC  $10^3$ /cumm) and Differential Leucocytic Count (DLC %) were estimated/ conducted as per the method described by [5].

#### Biochemical profile

Serum samples (control, pre-treatment and post treatment) were analyzed for some important biochemical parameters by using commercially available diagnostic kits (RT-1904 c). The data were analyzed by one way analysis of variance (ANOVA) and DMRT [6].

## Results and Discussion

The pre patent period in the present experimental *H. contortus* infection was observed as 20 days with a peak overall EPG value of  $2240.00 \pm 112.01$  on day 25 after infection. Kelkele *et al.* (2012) [7] reported the pre patent period of *Haemonchus* which was 21<sup>st</sup> day post-infection in their study. On the other hand, the pre patent period was recorded as 18<sup>th</sup> day of post infection by [8].

The mean Haemogram values in the experimentally infected goats showed a positive correlation with the blood loss due to the blood sucking activity of the parasite.

In the experimental study the haemato-biochemical profile showed a gradual decrease during experimental haemonchosis in case of Haemoglobin (Hb g/dl), Packed cell volume (PCV %), Total Erythrocyte count (TEC  $10^6/\text{cumm}$ ) lymphocyte % serum total protein g/dl, albumin g/dl, globulin g/dl and a gradual increase in Total Leucocytic Count (TLC,  $10^3/\text{cumm}$ ), Neutrophil %, Eosinophil % AST (IU/L) and ALT (IU/L) levels at different days of infection, but there was significant difference of the haemato biochemical values. All the haemato-biochemical parameters gradually returned towards normal level in treated group after treatment (Table 1).

**Table 1:** Haemato-biochemical profile of experimentally infected with *H. contortus*.

Parameters	Groups A (treated group)		Groups B (treated group)		Groups C (treated group)		Group D (infected group)		Group E (Healthy control)	
	25 <sup>th</sup> day of infection	After treatment (21 days)	25 <sup>th</sup> day of infection	After treatment (21 days)	25 <sup>th</sup> day of infection	After treatment (21 days)	25 <sup>th</sup> day of infection	After treatment (21 days)	25 <sup>th</sup> day of infection	After treatment (21 days)
Haemoglobin (g/dl)	6.12±0.28	6.93±0.31	5.10±0.28	6.20±0.31	6.15±0.28	6.65±0.12	5.13±0.28	4.44±0.31	8.30±0.28	8.28±0.28
PCV (%)	20.40±0.91	22.09±1.04	16.87±0.91	19.13±1.04	13.07±0.91	17.99±1.04	10.33±0.91	8.82±1.04	22.67±0.91	22.67±0.91
TEC ( $10^6/\text{cumm}$ )	10.39±79	11.23±0.90	8.98±0.79	9.82±0.90	7.86±0.79	8.87±0.90	10.32±0.79	8.70±0.90	11.50±0.79	11.96±0.79
TLC ( $10^3/\text{cumm}$ )	13.41±1.37	12.14±1.57	14.64±1.37	13.58±1.57	13.26±1.37	11.42±1.57	11.08±1.37	12.97±1.57	10.84±1.37	11.01±1.37
Neutrophils (%)	49.50±1.53	44.38±1.75	48.67±1.53	42.38±1.75	49.00±1.53	45.05±1.75	47.50±1.53	51.67±1.75	41.17±1.53	42.67±1.53
Lymphocyte (%)	37.83±1.69	47.28±1.93	37.83±1.69	49.33±1.93	37.67±1.69	46.58±1.93	40.33±1.69	35.65±1.93	51.67±1.69	50.83±1.69
Eosinophil (%)	8.50±0.34	4.25±0.39	8.83±0.34	4.13±0.39	8.83±0.34	4.72±0.39	8.00±0.34	9.52±0.39	3.17±0.34	3.33±0.34
Monocyte (%)	3.83±0.34	3.93±0.39	3.83±0.34	3.85±0.39	4.00±0.34	3.33±0.39	4.00±0.34	2.98±0.39	3.17±0.34	2.83±0.34
Basophil (%)	0.33±0.29	0.15±0.33	0.83±0.29	0.30±0.33	0.50±0.29	0.32±0.33	0.50±0.29	0.15±0.33	0.67±0.29	0.33±0.29
Total serum protein (g/dl)	4.83±0.18	5.46±0.20	4.73±0.18	6.09±0.20	4.85±0.18	5.84±0.20	4.34±0.18	3.57±0.20	6.49±0.18	6.12±0.18
Albumin (g/dl)	2.64±0.15	3.54±0.17	2.67±0.15	3.94±0.17	2.66±0.15	3.51±0.17	2.53±0.15	2.15±0.17	4.13±0.15	4.03±0.15
Globulin (g/dl)	2.19±0.21	1.91±0.24	2.06±0.21	1.96±0.24	2.19±0.21	2.33±0.24	1.81±0.21	1.42±0.24	2.36±0.21	2.10±0.21
AST/SGOT (IU/L)	103.16±4.84	72.19±5.52	110.14±4.84	70.12±5.52	102.27±4.84	72.12±5.52	101.43±4.84	104.98±5.52	56.18±4.84	59.09±4.84
ALT/SGPT (IU/L)	37.93±1.66	25.13±1.90	34.41±1.66	23.05±1.90	33.40±1.66	26.20±1.90	30.16±1.66	36.18±1.90	23.22±1.66	23.81±1.66

The present findings are in agreement with the reports of other worker [9, 10, 11, 12]. The lower haemato-biochemical profile could be due to blood loss caused by blood sucking nematodes<sup>13</sup>. Significant rise in the level of serum enzymes such as SGOT and SGPT during haemonchosis in goats were observed and it may be attributed that infestation of parasites usually associated with necrosis in the abomasal mucosa during their blood sucking activity and may be responsible for release of some toxin due to degeneration. The effect of toxemia may be possible reason for mal-function of liver cells. Sharma *et al.* (2001) [14] also analyze significant increases in SGOT and SGPT Barbari goats during haemonchosis.

## References

1. Abhishek Kumar, Haque S, Kumar M. Haemato-biochemical changes in nematodiosis in sheep. Indian Vet. J 2010;87:505-507.
2. Pandey V, Sharma N, Katoch R, Vohra S. Biochemical changes in an outbreak of gastrointestinal parasitic infection in Goat. Indian vet. J 2012;89(5):12-14.
3. Chakraborty D, Lodh C. Blood biochemical profiles in Fasciola, Haemonchus and Dictyocaulus species infection in goat-a comparative study. Indian Vet. J 1994;71:286-288.
4. Sharma DK, Chauhan PPS, Agarwal RD. Haematological changes in experimental haemonchosis in Barbari goats. Indian J Ani. Sc 2020;70(4):353-355.
5. Baker EJ, Silvertown RE, Luckcock ED. An introduction to Medical Laboratory Technology. 1<sup>st</sup> Ed<sup>n</sup>, Butterworth and co. (Publishers) Ltd., London 1965.
6. Schalm OW, Jain NC, Carrol EJ. Veterinary Haematology. 3<sup>rd</sup> Edition, Lea and Febiger, Philadelphia 1975.
7. Snedecor G, Cochran WG. Statistical Methods. 7<sup>th</sup> Edition Allied Pacific (P) Ltd., Bombay 1994.
8. Kelkele FA, Tolossa YH, Kass GM. Experimental infection of Ethiopian highland sheep by different infective doses of *Haemonchus Contortus* (L<sub>3</sub>): Haematological and parasitological parameters, serum protein concentrations and clinical responses. Ethiop Vet. J 2012;16(1):41-57.

9. Mahanta P. Experimental studies on *Haemonchus contortus* infection in goats and its treatment. M.V.Sc. Thesis, Assam Agricultural University, Guwahati-22, Assam 1976.
10. Rajguru DN, Pawar LS, Mohd. Saleem, Joshi SA. Haemato-biochemical alteration and therapeutic management of endoparasite induced caprine anaemia. Indian Vet. J 2002;79:973-975.
11. Abhishek Kumar, Haque S, Kumar M. Haemato-biochemical changes in nematodiosis in sheep. Indian Vet. J 2010;87:505-507.
12. Rajanish Kumar, Yadav CL, Stuti Vatsya. Haemato-biochemical alterations in sheep infected with *Haemonchus contortus*. Indian Vet. J 2010;87:122-125.
13. Suchita Kumari, Sinha SRP, Sucheta Sinha, Kumar A, Kumar P, Ali I. Haemato-biochemical changes in Sheep and goats during natural infection of *Haemonchus contortus*. Indian J Field Vet 2013;8(3):43-46.
14. Soulsby EJJ. Helminths, Arthropods and Protozoa of domesticated animals. 7<sup>th</sup> ed<sup>n</sup>. Bailliere Tindall and Cassell, London 1982, 234-235.
15. Sharma DK, Chauhan PPS, Agarwal RD. Changes in the levels of serum enzymes and total protein during experimental haemonchosis in Barbari goats. Small Ruminant Research 2001;42:119-123.