

RESEARCH PAPER

## Haematological changes in sheep infected with *Haemonchus contortus*

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### ABSTRACT

In the present investigation haematological parameters were studied in sheep suffering from *Haemonchus contortus*. Infected sheep showed clinical symptoms such as weakness, loss of weight, diarrhoea, oedematous swelling under the lower jaw (bottle jaw) and the belly, reduced milk, wool fall and pale skin. Infested sheep showed significant reduction in Hb ( $4.80 \pm 0.62$ ), PCV ( $16.62 \pm 3.59$ ), TEC ( $4.82 \pm 0.65$ ), TLC ( $4.25 \pm 0.12$ ), DLC-neutrophils ( $18.65 \pm 0.28$ ) and eosinophils ( $2.56 \pm 0.01$ ) while monocytes ( $5.21 \pm 0.29$ ) and lymphocytes ( $65.25 \pm 0.24$ ) were not significant.

**Key words :** *Haemonchus contortus*, Haematological parameters and sheep

**H***aemonchus contortus*, one of the most pathogenic nematodes, feeds on ruminant blood and causes severe anaemia (Backer and Douglas, 1966). Acute haemonchosis leads to death without showing more than signs of anaemia and hydraemia (Garg *et al.*, 2007). The heavy infection of this parasite causes to produce loss of body weight, digestive disturbance, poor growth and decreased production of wool in sheep and goats. According to Basith (2002), chronically haemonchosis is characterized by progressive weakness, wool falling, anaemia and bottle jaw condition. This form is most common in the area where mortality is low but morbidity is reached 100 per cent. According to Urquhart *et al.* (1987), each worm removes 0.05 ml blood per day so that sheep with a 500 *H. contortus* may lose about 250 ml per day resulting in decrease in erythrocytes, lymphocytes, hemoglobin, PCV, body weight and sheep become very weak and emaciated. According to Fitch (2006) 10,000 adult *Haemonchus* worms can kill a sheep. Keeping in view the loss due to such pathogenic parasite, the present investigation was done and it is still essential to alarm the veterinarian for timely treatment and necessary preventive measures to protect valuable breed and products of sheep.

### MATERIALS AND METHODS

In the present investigation, ten positive sheep aged between 1-2 years both sexes naturally infected with *Haemonchus contortus* were selected. Infection was diagnosed on the basis of clinical signs, presence of *H. contortus* egg in faecal samples and counting of egg per gram (EPG) of faeces was done as per standard methods

described by Soulsby (1986). Blood samples (2 ml) were collected from jugular vein with 20 gauge sterilized needle in sterilized vials containing EDTA (1 mg/ml) as an anticoagulant, from infected sheep to assess the haematological values *viz.*, hemoglobin (Hb), packed cell volume, total erythrocyte count (TEC), total leucocyte count (TLC) and differential leucocyte count (DLC)-neutrophil, lymphocyte, eosinophils and monocytes. Haematological parameters of 02 healthy sheep free from haemonchosis (healthy control) were also determined using the same methods. Data were statistically analysed by factorial completely randomized design (FCRD) method as per described by Snedecor and Cochran (1994).

### RESULTS AND DISCUSSION

Sheep suffering from *Haemonchus contortus* showed clinical symptoms of weakness, anaemia reduced milk, wool fall, skin pale, oedematous swelling under the lower jaw (bottle jaw condition) and diarrhoea. The haematological parameters are presented in Table 1. It is evident from Table 1 that there was significant decrease in hemoglobin ( $4.80 \pm 0.62$ ), packed cell volume ( $16.62 \pm 3.59$ ), total erythrocyte counts ( $4.82 \pm 0.65$ ), total leucocytes counts ( $4.25 \pm 0.12$ ), neutrophils ( $18.65 \pm 0.28$ ), and eosinophils ( $2.56 \pm 0.01$ ) as compared to healthy control sheep. Non-significant increase in lymphocyte ( $65.25 \pm 0.24$ ) and monocytes ( $5.21 \pm 0.29$ ) were observed in infected sheep than sheep of healthy control (Table 1). This corroborates with the findings of Sangwan and Sangwan, (2000) who reported decrease in Hb ( $4.55 \pm 0.62$ ), PCV ( $17.67 \pm 2.59$ ) and TEC ( $4.92 \pm 0.79$ ) of blood from infected sheep. Gadre *et al.* (2008) reported

**Table 1 : Haematological values in sheep infected with *Haemonchus contortus***

Sr. No.	Blood parameters	Mean value in healthy sheep (02)	Mean value in infected sheep (10)
1.	Hb (Hb gm/100 ml)	9.42±0.20	4.80±0.62
2.	PCV (PCV%)	30.0±0.62	16.62±3.59
3.	TEC (10 <sup>6</sup> /cumm)	9.63±0.21	4.82±0.65
4.	TLC (10 <sup>3</sup> /cumm)	7.32±0.11	4.25±0.12
5.	Neutrophills (%)	40.12±0.22	18.65±0.28
6.	Eosinophills (%)	6.01±0.12	2.56±0.01
7.	Lymphocyte (%)	52.01±0.30	65.25±0.24
8.	Monocytes (%)	4.00±0.25	5.21±0.29

\* indicates significance of value at P = 0.05

decreased in Hb, PCV, TEC, TLC, neutrophills and eosinophills. Such reports have been observed in cattle and buffaloes infected with helminth parasites.

*Haemonchus contortus*, being voracious blood suckers in nature, is likely to cause changes in haematological values. The decrease in Hb, PCV, TEC, TLC and DLC- neutrophills and eosinophills in infected sheep were significant (P<0.05) when compared with the healthy control sheep. However, variation in total lymphocyte and monocytes were not significant. Haematological findings of affected sheep with significant decrease hemoglobin, packed cell volume, total erythrocyte count suggested anaemia condition in comparison with healthy sheep, which substantiate the findings of anaemic condition by Sangwan and Sangwan (2000). The observed significant haematological changes in affected sheep reflects the hypersensitivity to parasites.

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