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Haematological Changes in Haemonchus Contortus Affected Lambs

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Abstract

The present study was conducted to investigate the hematological changes in *Haemonchus contortus* affected lambs. A total of 350 Nellore brown sheep flock maintained in an extensive system of grazing, and out of which 40 lambs were selected randomly. Even though the sheep were dewormed regularly, an outbreak was noticed. Two lamb were found dead in the flock prior to screening. During screening out of 40 lambs, 18 lambs were found normal and were kept as control group and 22 lambs which exhibited clinical signs of anemia, poor growth, emaciation, diarrhea were selected. Blood samples were analyzed for the estimation of Total erythrocyte (RBC), total leukocyte (WBC) count, hemoglobin concentration (g/dl), Packed cell volume (%), MCV (fl), MCH (pg), MCHC (g/dl) and compared with normal animals. The infection was confirmed to be due to *H. contortus* following the recovery of *Haemonchus* worms at post-mortem. Haematological profile revealed that there was a significant ($P < 0.05$) decrease in total erythrocyte count, total leukocyte count, hemoglobin concentration, packed cell volume and MCHC values in *H. contortus* affected lambs.

Keywords: *Haemonchus contortus,* Hematology, Lamb.

INTRODUCTION

Southern districts of Andhra Pradesh holds a population of approximately 10-20 million sheep and goat. The number of small ruminants is high since the majority of the land can only be farmed in rain fed conditions forcing farmers to engage in other pursuits like raising sheep in these districts. Because of the close grazing habit of sheep, GI nematode infections are common and among the various GI nematodes *H contortus* is the predominant parasite. *Haemonchus contortus*, a blood sucking nematode is also known as barber poll worm or red worm that uses sheep as a host and causes haemonchosis characterized by anemia and severe damage to the abomasal mucosa resulting in lower serum protein and higher enzyme activities in the affected animals (Bordoloi *et al*., 2012). Haemonchosis is a disease of economic importance in sheep resulting in high morbidity moderate mortality, poor growth and affects the productivity in sheep. Parasitic nematodes (GI round worms) of small ruminants and other livestock have major economic impact worldwide (Roeber *et al*., 2013). The main species that causes the disease in sheep is *H. contortus* (Kuchai *et al*., 2011and 2012) is found in the abomasum resulting in significant blood loss. Both larval and adult worms are blood suckers and

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leave wounds/ hemorrhages on the abomasal wall of the host. Debilitating infection with this parasite is commonly reported in young animals (Soulsby 1982).

The present study was conducted to investigate the hematological changes and postmortem findings in *H. contortus* affected lambs in Southern districts of Andhra Pradesh.

MATERIALS AND METHODS:

The study was carried out at Southern districts of Andhra Pradesh where an outbreak occurred. Two lambs were reported to have died before screening. In the flock, 22 lambs showed clinical signs of GI nematodal infection and remaining 18 lambs appeared normal without any clinical signs and were treated as control group. The total sheep flock 350 no's out of which 40 lambs were below 6 months age and these lambs were used for the present experiment. The blood samples were analyzed for the common hematological parameters like total erythrocyte (RBC), leukocyte (WBC) count, Hemoglobin (Hb) levels, Packed Cell Volume (PCV), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC). The data collected were analyzed by one way ANOVA in SPSS 22 software and Chi-sqared test.

RESULTS & DISCUSSION

The present study demonstrated the hematological findings in *H. contortus* affected lambs (*Table 1*), which revealed a significant ($P < 0.05$) reduction in total erythrocyte count, total leukocyte count, hemoglobin concentration, Packed cell volume and MCHC values. These findings were similar to that recorded by Ameen *et al*., (2010), who reported a significant decrease in total erythrocyte count, total leukocyte count and hemoglobin concentration in below 6 months age *H. contartus* affected lambs. The significant ($P < 0.05$) decrease in PCV and MCHC in lambs is due to severe anemia caused by *H. contortus.* Sharma *et al*., (2000) and Ameen *et al*., (2010) also found similar changes in PCV and MCHC in 6-9 months age group lambs and below 6 months age group kids respectively. This study is also in agreement with the findings of Mannan *et al*., 2017 who recorded reduction in PCV, total erythrocyte count and hemoglobin concentration in *H. contortus* affected sheep and goat. Ameen *et al*., (2010) and Sharma *et al*., (2000) also reported similar findings in haemonchosis in goat. Whereas, Ceriac *et al*., (2017) recorded decrease of PCV, total erythrocyte count and hemoglobin with an increase of reticulocytes in goats experimentally infected with *H. contortus*.

Table 1. Haematological findings of *Haemonchus contortus* affected lambs (< 6 months age)

Parameter	Control (Healthy) Lambs	*Haemonchus contortus* affected Lambs
Total RBCs ($X10^6$/µl)	8.7±0.22 [a]	5.27±0.22 [b]
Total WBCs ($X10^3$/µl)	10.2±0.17 [a]	8.7±0.12 [b]
Hb (g/dl)	12.7±0.14 [a]	6.1±0.14 [b]
PCV (%)	42.3±0.27 [a]	31.6±0.21 [b]
MCV (fl)	52.6±0.21 [a]	48.8±0.12 [a]
MCH (pg)	11.9±0.17 [a]	10.8±0.2 [a]
MCHC (g/dl)	27.6±0.26 [a]	23±0.23 [b]

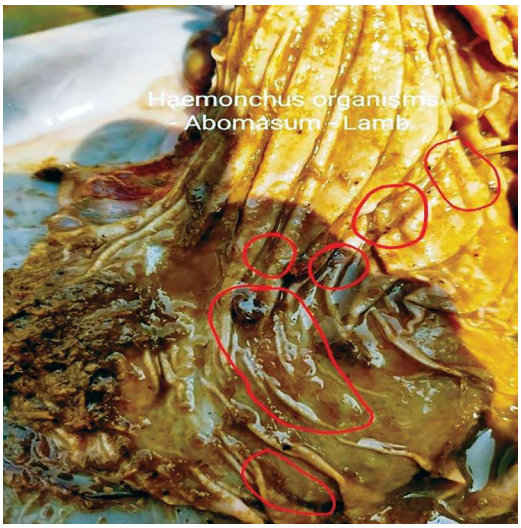

Fig. 1: Live *Haemonchus contortus* worms in abomasum of Lamb

The findings in the present study revealed that there was decrease in total erythrocyte, leukocytes count, hemoglobin, PCV and MCHC with anemia in the *H. contortus* infected lambs compared to control group. An adult *H. contortus* worm can suck about 0.05ml blood per day from the site of attachment in each host (Urquhart *et al*., 1996) and this blood sucking activity *H. contortus* resulting in reducing hemoglobin levels which in turn reducing the PCV, total erythrocyte count, MCV, MCH and MCHC values which may result in haemolytic anemia in sheep (Siham *et al*., 1997, Sharma *et al*., 2000). This study also support that the *H. contartus* parasites has effect on blood profile (Ameen *et al*., (2010) and Mannan *et al*., 2017). The results obtained

have been confirmed with the findings obtained by Radostitis *et al*., (1994).

CONCLUSION

The hematological values in *Haemonchus contortus* affected lambs were decreased significantly especially the total erythrocyte, leukocyte count, Hb, PCV and MCHC values. It was concluded that the *Haemonchus contortus,* the blood sucking parasite which produce severe anemia in sheep, which may be fatal in young animals.

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Conflict of Interest

All the authors declare that they have no conflicts of interest

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