

# Haemato-Biochemical Changes in Goats Infected with GI Parasites with Special Reference to Oesophagostomosis

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**Abstract:-** In order to find out the haematobiochemical changes in goats suffered from oesophagostomosis and other gastrointestinal parasite, 200 goats slaughtered at Cantonment Board slaughter house, Mhow were screened to study the haematobiochemical alteration in infected goats. In haematological findings of oesophagostomosis and other gastrointestinal parasitic infection, significant decrease was in evidence in mean values of total erythrocyte count (TEC), haemoglobin (Hb) and packed cell volume (PCV) in mixed parasitic infection whereas mild decrease was found in animals infected with *Oesophagostomum* spp. when compared with unaffected goats, the mean values of total leucocyte count and neutrophil count was significantly increased whereas mild increase in lymphocyte and eosinophil counts was noted in animals infected with *Oesophagostomum* spp. and mixed infection. However, monocytes were increased moderately in chronic cases of oesophagostomosis. Decrease in the values of serum protein and serum calcium was recorded whereas increased values of blood urea nitrogen (BUN) was recorded both in mixed as well as *Oesophagostomum* infected goats with no changes in serum creatinine.

**Keywords:-** Goats, Haemato-Biochemical Changes, *Oesophagostomosis*

## I. INTRODUCTION

Worldwide, the gastrointestinal (GI) nematodes are considered as one of the most important parasites responsible for continuous economic losses to animal owners due to its morbidity and mortality (Sanyal, 1996). According to Das *et al.* (2013), GI parasites are responsible for the economic loss of Rs. 372.35/goat/anum. *Oesophagostomum* spp. are intestinal parasites, which is a very common parasite of goats. These parasites cause uninodular and multinodular oesophagostomosis which causes heavy economic losses, reduced production, morbidity and mortality in infected goats. Development of third stage larvae in the colon wall results in formation of inflammatory masses which results in severe pain in abdomen, diarrhoea and loss of body weight and occasionally may cause peritonitis and intestinal occlusion (Cibot *et al.*, 2015). Oesophagostomosis being one of the most

diseases of many livestock species, the survey was carried out to note the haematobiochemical changes in this disease and other gastrointestinal parasitic infection in slaughtered goats of Malwa region of Madhya Pradesh.

## II. MATERIALS AND METHODS

In the current study, 200 goats were selected randomly which were slaughtered at Cantonment Board Slaughter House, Mhow (Madhya Pradesh).

### A. Haematological Changes

Total 5ml of blood containing EDTA (Anticoagulant) @ of 2mg/ ml of blood was collected for conducting the haematological studies.

Following haematological parameters were estimated as per the method detailed by Jain (1986).

1. Total Erythrocyte Count (millions/ $\mu$ L)
2. Total Leukocyte Count (thousand/ $\mu$ L)
3. Haemoglobin Concentration (gram/dl)
4. Packed Cell Volume (%)
5. Differential Leukocyte Count (%)

### B. Wright staining Procedure:

Dried blood smears were covered with Wright's stain and let stand for 2 minutes. The stain must not precipitate on the slide through evaporation.

### C. Serum biochemical examination

Approximately, 3 ml of blood was collected from each animal aseptically from jugular vein using a plain vacutainer without anticoagulant. The vacutainer tubes were kept at room temperature in the slanting position in order to clot the blood and these tubes were centrifuged at 3000 rpm for a period of 5 minutes. Serum samples were collected in screw capped plastic vials and these vials were kept at  $-20^{\circ}\text{C}$  till further use.

The sero biochemical parameters were carried out with the automatic biochemical analyzer Erba Mannheim EM-200 make Transasia. The details of sero biochemical studies with their methodology are given in Table 1.

Table 1:- Details of biochemical parameters and kits used (methods and unit of expression)

Parameters	Kits used	Method	Units
Creatinine	ERBA diagnostic Ltd.	Jaffe's method initial rate	mg/dl
BUN	ERBA diagnostic Ltd.	GLDH-UREASE method, initial rate	mg/dl
Calcium	ERBA diagnostic Ltd.	IFCC method, kinetic	mg/dl
Total serum protein	ERBA diagnostic Ltd.	Biuret Method, End Point	g/dl

### III. RESULTS AND DISCUSSION

Increased TLC values recorded in the present study, might have been due to an increase in local immune response by eosinophils as well as due secondary bacterial infection. The moderate to mild increase of eosinophils and neutrophils is due to phagocytic activity of the cell digesting the particular matter and debris of parasite as an effect of cell mediated immune response in *Oesophagostomum* and mixed parasitic infections.

Biochemical parameters of *Oesophagostomum* infected goats revealed a significant decline in the mean values of total serum protein. Similar findings were reported by Pollistry *et al.* (2010) Majid *et al.* (2011) and Pandey *et al.* (2012). The level of total serum protein is affected by various factors such as age, sex, season and different parasites. As in case of gastrointestinal parasitic infections, there is a substantial loss of host proteins in the parasitic tracts and some of the proteins are lost through the faeces. Our results confirmed the negative effect of GIP on total serum protein concentration in goats (Table 02).

The mean values (Mean±S.E.) of packed cell volume in oesophagostomosis infestation, mixed infection and unaffected goats were 29.85±0.62, 21.45±1.02, and 25.63±1.56%, respectively and found to be significantly different from each other (Table 02).

The mean values (Mean ± S.E.) of total erythrocyte count in oesophagostomosis infestation, mixed infection and unaffected goats were 5.42±0.17, 6.02±0.25 and 9.09±0.39 million/ $\mu$ L, respectively and found to be significantly different from each other (Table 02).

In this experimental design, values of total serum protein in *Oesophagostomum* infected animals, animals harbouring mixed infection and unaffected goats were as 4.40± 0.24, 5.16±0.24 and 9.05±0.76g/dl, respectively and were found to be significantly different from each other (Table 02).

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Table 2:- Haemato-biochemical profile of goats infected with *Oesophagostomum* infection and apparently healthy goats (n=200)

	Parameters		Healthy goats	<i>Oesophagostomum</i> infected goats
			Mean $\pm$ SE	Mean $\pm$ SE
1.	Haematological parameters	Hb (g%)	9.63 $\pm$ 0.43 <sup>b</sup>	10.30 $\pm$ 0.35 <sup>b</sup>
		PCV %	25.63 $\pm$ 1.56 <sup>b</sup>	29.85 $\pm$ 0.62 <sup>a</sup>
		TEC (x 10 <sup>6</sup> /cumm)	6.09 $\pm$ 0.39 <sup>a</sup>	5.42 $\pm$ 0.17 <sup>b</sup>
		TLC (x10 <sup>3</sup> /cumm)	9.0 $\pm$ 0.60	10.50 $\pm$ 0.55
2.	DLC	Neutrophils (%)	58.27 $\pm$ 0.38 <sup>ab</sup>	65.45 $\pm$ 2.09 <sup>a</sup>
		Lymphocytes (%)	38.09 $\pm$ 0.28	37.40 $\pm$ 0.14
		Monocytes (%)	1.63 $\pm$ 0.20	2.00 $\pm$ 0.22
		Eosinophils (%)	1.20 $\pm$ 0.16	1.80 $\pm$ 0.20
		Basophils (%)	0.45 $\pm$ 0.20	0.20 $\pm$ 0.09
3.	Biochemical parameters	Total serum protein (g/dl)	9.05 $\pm$ 0.76 <sup>a</sup>	4.40 $\pm$ 0.24 <sup>b</sup>
		Serum creatinine(mg/dl)	0.94 $\pm$ 0.09 <sup>a</sup>	0.68 $\pm$ 0.03 <sup>ab</sup>
		BUN (mg/dl)	24.00 $\pm$ 1.50 <sup>b</sup>	38.55 $\pm$ 4.03 <sup>ab</sup>
		Calcium (mg/dl)	10.10 $\pm$ 0.05 <sup>a</sup>	6.00 $\pm$ 0.42 <sup>b</sup>

Values with different superscript in same row differ significantly ( $p < 0.05$ )