

PREVALENCE OF FASCIOLA HEPATICA IN SHEEP AND GOATS IN DISTRICT DERA ISMAIL KHAN

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ABSTRACT: The present study was carried out to determine the prevalence of Fasciola Hepatica in sheep and goats of Dera Ismail Khan. In this respect faeces and blood samples of 380 sheep and 400 goats were screened to identify 100 infected animals (50 sheep, group-A) and 50 goats, group-B) positive for fascioliasis. Haemoglobin level, packed cell volume, total leukocyte count, differential leukocyte count and total blood serum protein were studied for the positive animals. The faecal examination showed 13.39% and 12.50% fascioliasis in sheep and goats, respectively. On an average Group A and B were attaining 650 and 750 Eggs Per Gram (EPG), 8.67 and 8.15 million/cmm Total Erythrocytic Count, 23.95% and 25.50% Packed Cell Volume, 7.25 and 7.15 g/100ml haemoglobin level of blood, 6.25×10^3 /cmm and 7.39×10^3 /cmm Total Leukocyte Count, 5.76 and 5.68 g/100 ml Total Serum Protein, respectively. There was no deviation in monocytes percentage than the normal range. It was concluded that Fascioliasis in sheep and goat in district D.I.Khan is considerable threat for the health and production of animals as well as a cause for poor mutton quality from infested sheep and goats.

Key words: Fasciola Hepatica, sheep, goat, faecal, blood.

INTRODUCTION

Sheep and goats play an important role in terms of economics, source of food and nutrition by providing milk, mutton, wool, manure, and skins (Pawal *et al.*, 2004). Pakistan is rich enough with different breeds of sheep and goats that are contributing in the economics for the majority of rural population and the nation as well in addition to providing rich nutrients to poor and deprived rural populations. Parasitic diseases are one of the main obstacles in the development of livestock production and industry worldwide (Ijaz *et al.*, 2009; Khalil ur Rehman *et al.*, 2009; Bilal *et al.*, 2009). Among the parasites, Fasciola hepatica causes heavy economic losses (Khan *et al.*, 2009). The fascioliasis also affects different blood parameters in the infected animals that are important for the diagnosis of the disease. In Pakistan, fascioliasis is one of the major parasitic problems as 50 % of the livestock has been reported to be infected with it (Pal and Qayyum, 1992). It is also a major problem of sheep and goats in different parts of Pakistan. Dera Ismail Khan is an agricultural district of Khyber Pakhtunkhwa province that has a large number of sheep and goats. The present study was conducted for the prevalence of Fasciola hepatica in sheep and goats brought to the slaughter house in District Dera Ismail Khan. Naturally infected sheep and goats irrespective of their age, sex, breed and health status were included in this study that would serve as milestone for the future preventive and control measures against Fascioliasis in this area.

MATERIALS AND METHODS

The present study was conducted for the prevalence of fascioliasis on the basis of faecal examinations and its effects on blood parameters of sheep and goats in the District Dera Ismail Khan, Pakistan.

Perimental animals: The experiment was conducted on the sheep and goats brought to abattoir of district Dera Ismail Khan. Faeces of 380 sheep and 400 goats were examined to find out 50 sheep (group-A) and 50 goats (group-B) positive for fascioliasis.

Examination of faecal samples: About ten grams faecal sample was collected directly from the rectum of each sheep and goat in a clean polythene bag. These faecal samples were labeled and refrigerated till further processing for the following examinations: (i) Fresh smear examination (ii) Sedimentation method and (iii) Egg counting technique.

Collection of blood samples: Five ml of blood was drawn from the jugular vein of each experimental sheep and goat into a 10 ml disposable syringe and labeled accordingly. Small quantity of the blood from syringe was discharged into Biju bottle containing 1-2 drops of 1 % EDTA (anticoagulant) and mixed by gentle shaking. The remaining blood was allowed to coagulate in slanting position for 2-4 hours at room temperature to facilitate the removal of serum. Then serum was collected in sterile screw capped plastic bottles, labeled and kept at -20 °C till further use.

The following studies were carried out on each sample of blood:

- i) Total erythrocyte count (Benjamin,1967)
- ii) Haemoglobin level (Wintrobe, 1965).
- iii) Packed cell volume (Benjamin, 1978).
- iv) Total leukocyte count (Benjamin, 1967).
- v) Differential leukocyte count
- vi) Total blood serum protein (Henry *et al.*, 1974).

RESULTS

The prevalence of fasciolia hepatica in sheep and goats in the District Dera Ismail Khan was determined by the positive faecal samples and also the

effect of fascioliasis on the different blood parameters of infested animals was studied.

Incidence: Fifty faecal samples out of 380 examined sheep and 50 samples out of 400 examined goats were found positive. Thus the faecal samples examination results showed 13.39% and 12.50% Fascioliasis in sheep and goats respectively (Table I).

Egg per gram of faeces: The average Eggs Per Gram (EPG) in group A was 650 with a range of 310-815. In group B, the EPG was ranged from 300 to 750 with an average of 570 (Table 1).

Table I: Prevalence of fascioliasis and EPG

Animal	Number of faecal sampled examined	Number of positive sampled	Percentage of infestation	Number of eggs/ gram of faeces
Sheep (Group-A)	380	50	13.39%	310-815 (average 650)
Goats (Group-B)	400	50	12.50%	300-750 (average 570)

Total Erythrocytic Count (TEC): The TEC of the groups A was 7.02 to 11.75 million/ cmm. (average: 8.67 million/cmm) and group B was 7.50 to 8.50 million/cmm (average: 8.15 millions/cmm) as reflected in Table II.

Packed Cell Volume (PCV): The PCV of group A was 20.00% to 25.55% (average: 23.95%) and group B was 22.00% to 35.00% (average: 25.50%) (Table II).

Haemoglobin Estimation (HE): The average value of Hb recorded for group A was 5.25 to 12.00 gms/100ml (average: 7.25 gms/100ml) and group B was 5.50 to

11.30 gms/100 ml (average: 7.15 g/100ml) of blood (Table II).

Total Leukocytic Count (TLC): The average values of TLC of experimental sheep (group-A) 6.25 x 10³ /cmm and goats (group-B) was 7.39 x 10³/cmm, respectively (Table II).

Total Serum Protein (TSP): The values of total serum protein of group A was 4.25 to 6.97 gms/100ml (average: 5.76 gms/100ml) and in group B was recorded from 4.00 to 6.80 gms/100 ml (average: 5.68 g/100 ml), respectively (Table II).

Table II: Results of different blood parameters for group A and B

Blood parameters	Group A		Group B	
	Range	Average	Range	Average
TEC(million/cmm)	7.02-11.75	8.67	7.50-11.50	8.15
PCV (%)	20.0- 25.55	23.95	22.0- 35.0	23.50
HE (gm /100ml)	5.25- 12.0	7.25	5.50 -11.30	7.15
TLC (1000/cmm)		6.52		7.39
TSP gms/100ml	4.25-6.97	5.76	4.00 - 6.80	5.68

Differential Leukocytic Count (DLC)

Lymphocytes: The lymphocytic values of group A were from 45% to 62% (average: 58.1%) and in group-B were 48.0% to 63.5% (average: 60.6%) (Figure I).

Neutrophils: The values of neutrophils for group-A were 27.00% to 38.00% (average: 31.7%) and in group B it was 27.00% to 34.80% (average: 28.1%) (Figure I).

Eosinophils: The percentage of eosinophils for group-A was 3.00% to 12.00% (average: 7.6%) and in group B was 6.00% to 15.40% (average: 8.5%) (Figure I).

Basophils: The percent value of basophils in group-A was 0.00 to 2.00% (average: 0.5% and in group B was 0.00 to 1.80% (average: 0.08%), so no obvious change was noticed in the sheep and goats having Fascioliasis and average values are within the normal range (Figure I).

Monocytes: The percentage of monocytes for group-A was 0 to 4.0% (average: 1.6%) and in group B was 0 to 4.2% (average: 2.3%) (Figure I). The results show that there was no deviation in monocytes percentage than the normal range.

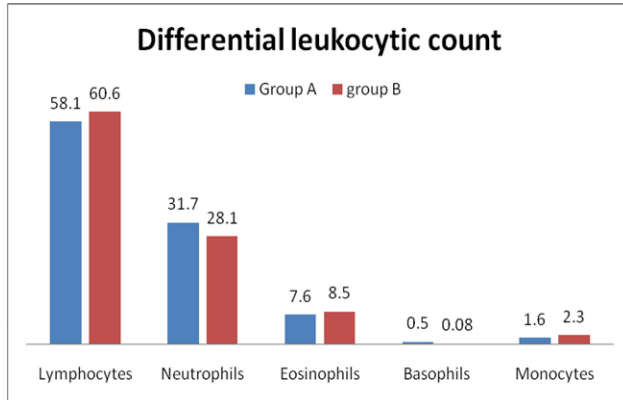


Figure I: Percent Values of DLC in groups A and B

DISCUSSION

The present study was designed to find out the prevalence of Fascioliasis in sheep and goats and to compare the rate of infestation of the parasite between them in District Dera Ismail Khan. The affects of infestation on blood parameters were also studied. The animals used for this study were naturally infected sheep and goats irrespective of their age, sex, breed, health status and diet schedule. The Fascioliasis was confirmed by the faecal examination of sheep and goats.

The faecal samples of 50 sheep were found positive out of 380 examined samples, thus the prevalence in sheep was 13.39% and out of 400 goats 50 samples were found positive for Fascioliasis indicated the 12.50% prevalence in goats (Table I). The present study was in agreement with Durrani *et al.* (1981) who has recorded 12% incidence in sheep.

The results of present studies for the incidence of fascioliasis were based on faecal examination that were supported by Miller *et al.* (1998) whom study was based on flukes confirmation in the liver. In another study, prevalence rate of fascioliasis was 1.4% in sheep and 12.3% in goats (Mirza and Razzak, (1998).

In the present study 50 blood samples from sheep and 50 blood samples from goats naturally infected with fasciola hepatica were examined for haematological studies. Marked anaemia was observed that is explained by low level of haemoglobin as mentioned in Table II. Our results are in line with the findings of Maqsood *et al.* (1996); Nawathe *et al.* (1985); Mohiuddin *et al.* (1985) who had carried out almost similar aspects of studies.

The Total Erythrocytic Count was reduced in infected animals of both the groups (Table II). In group A

and group B the average total erythrocyte count was 11.65 and 11.88 million/cubic mm respectively. The average packed cell volume values were 23.95% for group A and 25.50% for group-B, which was markedly reduced than the normal (Table II). The findings about haemoglobin, packed cell volume and erythrocytic count in present study correlate with the results of Ijaz *et al.* (2008). Table II recorded the differential leucocytic count study of blood that revealed the marked eosinophilia (average eosinophils count was 6.7% for group-A and 8.5% for group-B) with slight decrease in neutrophils (for group A, 31.7% and for group-B, 28.1%) and increase in lymphocyte percentage (for group A, 58.1% and for group-B, 60.6%) in infested animals.. The average of total serum protein values in group A and B were 5.76 gm/10ml and 5.68 gm/100ml of blood recoded in Table II respectively. The decrease in plasma albumin is due to loss of blood into gastrointestinal tract through blood sucking activities of adult flukes and through leakage of protein via bile duct epithelium (Pal and Qayyum, 1992). It is concluded that sheep and goats are infested with Fasciola hepatica that results in changes in different blood parameters. Fasciola hepatica infestation may result in anemia that is indicator for the poor growth and poor quality of mutton.

Conclusions: The study arrived at conclusion that prevalence of Fascioliasis has been considered proven threat in sheep and goat population in district D.I.Khan region.

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