



Diagnosis and therapeutic management of gastro intestinal parasites of small ruminants in and around Rajendranagar, Hyderabad

^{1*}S.Soujanya, ²J.Jyothi

^{1*}Assistant Professor, Department of Veterinary Pathology, College of Veterinary Science, PVNRTVU, Rajendranagar, Hyderabad, Telangana, India.

²Assistant Professor, Department of Veterinary Clinical Complex, College of Veterinary Science, PVNRTVU, Rajendranagar, Hyderabad, Telangana, India.

<https://doi.org/10.5281/zenodo.8370742>

Abstract

The study was aimed at determining the effect of gastro intestinal parasitism, its diagnosis and therapeutic management in small ruminants. The study was conducted in and around Hyderabad for a period of one month. 34 goats of either sex aged between 3-6 months showing the clinical signs of diarrhoea, anorexia, general weakness were screened by direct faecal smear method for the presence of helminthic eggs in faeces. Out of 34 samples, 19 were found positive for helminthic infestation and rest 15 were found negative which were used as control for further scrupulous comparative elucidation of hematobiochemical study. Results indicated that there was a significant decrease in the mean Hb, PCV, TEC, TP and albumin in all the infected animals. However, there was a significant increase in TLC in infected animals. The positive animals were treated with fluid therapy, anti-helminthics and antibiotics. The improvement was observed on day 5 of above given treatment in all the affected animals.

Keywords: Gastro Enteritis, Parasitic Ova, Worm Burden, Sheep & Goat, Faecal Examination.

Introduction

Livestock plays an important role in Indian agricultural economics and directly proportional to the farming community (Kumar *et al.*, 2015). In countries like India, small ruminants hold a prime niche for sustainable agriculture and supports socio-economic functions worldwide (Gupta *et al.*, 1985; Tariq *et al.*, 2008). Endoparasites are of prime importance in sheep and goats. Geographical and climate conditions of India are conducive for the optimum growth and proliferation of parasites posing challenge for the veterinarian. Parasitic diseases are major cause for poor health and productivity in goats due to 6-12 kg weight loss per animal per year and 40% mortality rates in goat herd (Kusiluka *et al.*, 1998). A related study reported that among the gastro intestinal parasites, Strongyle nematodes are considered as pathogenic and significant parasites affecting small ruminants (Perry *et al.*, 2002). More over coccidiosis caused by the genus *Eimeria* is a widely spread parasitic disease either clinically or



subclinically among the small ruminants in Hyderabad region of India and all over the world (Agyei *et al.*, 2004; Gadelhaq *et al.*, 2015; Majeed *et al.*, 2015). Coccidian parasites mostly cause enteritis particularly noticed in young goats under stress in poor farm conditions which lead to high mortality rate among the goat kids (Ratanapob *et al.*, 2012). Helminthic infection of gastro intestinal tract is one of the major problems in goats which is characterized clinically by enteritis, anaemia, emaciation, dehydration and death. They may affect the growth, body weight, yield, and reproductive performance of animals and also leading cause of economical loss to the farmers (Sharma *et al.*, 2014). In subclinical form, symptoms like anaemia, hypoproteinaemia and decreased blood glucose levels are noticed due to worm burden (Maiti *et al.*, 1999). Haematological and biochemical analysis indicates the degree of damage to host tissue and as well as severity of parasitic infection (Otesile *et al.*, 1991). In Present study, the diagnosis of gastro intestinal parasites in small ruminants along with the therapeutic management in and around the Hyderabad region was reported.

MATERIAL & METHODS

The present study was carried out with a total of 34 faecal samples from small ruminants aged between 3-6 months received at Veterinary Clinical Complex, Rajendranagar, Hyderabad over a period of one month.

Collection and analysis of faecal samples:

Two grams of faecal sample was collected directly from the rectum of each animal. The faecal samples were analyzed by direct smear method for the presence of helminthic eggs. The animals which found positive for eggs of helminths were considered as group 2 and rest of them were considered as group 1.

Evaluation of haemato-biochemical parameters:

Blood samples from all the animals were collected for haemato-biochemical investigation. The haematological parameters studied were Haemoglobin (Hb), Packed cell volume (PCV), Total erythrocyte count (TEC) and Total leucocyte count (TLC). Biochemical parameters studied were total serum protein (TP) and albumin. The group 1 animals were used as control for haemato-biochemical study. Data collected was analyzed statistically as per the methods described by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION



Out of 34 faecal samples, 19 samples were found positive for parasitic infestation which were selected as infected (group 2) animals and the rest 15 apparently healthy animals were used as control (group 1).

Clinical signs:

The present study disclosed 55.9 percent of the natural infection with gastro intestinal parasites in small ruminants. The infected animals showed clinical signs like inappetance to anorexia, general weakness, diarrhoea, dehydration, weight loss and depression. Coccidia infected small ruminants showed the manifestation of watery diarrhoea with clumps of mucus mixed with blood and sometimes change in color of faeces to yellow or brown in kids and haemorrhagic enteritis in adults. These findings agreed with those of Foreyt 1990, Koudela and Bokova (1998) and Risso *et al.* 2015.

Percentage of gastrointestinal helminth positives in small ruminants:

Out of 19 helminth positive samples, Strongyle species 8 (42.1%), Eimeria oocyst 6 (31.6%), Trichuris species 3 (15.8%), Haemonchus species 2 (10.5%) were detected (Table 1). Different parasitic ova found in faecal examination were showed in Fig. 1, 2, 3 and 4. In the current study, among gastro intestinal nematodes Strongyle infection was more pronounced. Similarly, higher prevalence of Strongyle infection (69.27%) was previously reported by Singh *et al.* 2015.

Table 1: Percentage of gastrointestinal helminth positives in small ruminants

Total No. of positive samples	Parasite	No. of samples found positive	Percent infection
19	Strongyle species	8	42.1%
	Eimeria oocyst	6	31.6%
	Trichuris species	3	15.8%
	Haemonchus species	2	10.5%

Haemato-biochemical parameters:

In present study, a significant ($p < 0.05$) reduction in haemoglobin, TEC and PCV and a significant ($p < 0.05$) increase in TLC values were noticed in infected animals when compared with control group (Table 2).

Haemoglobin, TEC and PCV may be reduced due to acute loss of blood by suckling activity and haemorrhages caused by various parasites (Bhat *et al.*, 2004; Amulya *et al.*, 2014). The increase in TLC may be due to an increase in local immune response by eosinophils and also may be due to presence of secondary bacterial infection (Amulya *et al.*, 2014; Ahmed *et al.*, 2006).



A significant ($p < 0.05$) decrease in serum total protein and albumin levels were observed in infected group when compared to control group (Table 2).

The lowered levels of serum total protein in gastro intestinal parasitism is attributed to the leakage of plasma through the injured gut caused by parasites (Radostits *et al.*, 1994). This loss is predominantly due to loss of albumin which is having smaller size and osmotic sensitivity due to fluid movement (Tanwar and Mishra, 2001).

Table 2: Haemato-biochemical parameters

	Parameters		Healthy animals (Group 1)	Infected animals (Group 2)
1.	Haematological parameters	Hb (g%)	12.33 \pm 0.16 ^a	7.78 \pm 0.14 ^b
		PCV (%)	43.22 \pm 0.33 ^a	32.56 \pm 1.06 ^b
		TEC ($\times 10^6$ / Cumm)	9.47 \pm 0.56 ^a	6.21 \pm 0.21 ^b
		TLC ($\times 10^3$ / Cumm)	8.15 \pm 0.26 ^b	9.76 \pm 0.31 ^a
2.	Biochemical parameters	Total serum protein (g/ dl)	6.3 \pm 0.22 ^a	5.12 \pm 0.22 ^b
		Albumin (g/ dl)	4.43 \pm 0.09 ^a	3.16 \pm 0.09 ^b

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

Therapeutic management:

The gastro intestinal parasitic affected animals were treated with intravenous fluid therapy (5% dextrose normal saline and ringers' lactate @ 40 ml/kg/hr) for water and electrolyte replacement and to correct acid base disturbances until the volume deficit is corrected. Injection astymin containing aminoacids was given @ 1-2 ml/ kg body weight to animals which showed decreased total protein content. Antimicrobial therapy was given with ceftriaxone @ 5-10mg/kg body weight. To reduce the intestinal motility drugs such as atropine @ 0.02-0.04 mg/kg body weight, gastrointestinal adsorbants such as kaolin and pectin @ 10g/animal were also given. Anti helminthic treatment given with fenbendazole @ 5-7.5 mg/kg body weight to control Strongyles, Haemonchus and Trichuris species. To control Eimeria infection, amprolium @ 2g/kg body weight and biosulpha containing sulphadimidine @ 27.5 mg/kg body weight was given. The improvement was observed on day 5 of above given treatment in all the affected animals.

Conclusion



The overall higher incidence of nematode infection in present survey could be due to lowered immunity of host as a result of malnutrition and also in many of the farms different species of animals were grazing on the pasture land due to lack of fencing and restrictions for grazing. Keeping in view of the above results, some of the important control measures like separate practice of grazing of animals with low stocking rate were adopted to reduce the parasitic infection at farm level and also to reduce the worm burden. The climatic factors during rainy season like temperature and humidity are favorable for the development and survival of pre parasitic stages of nematodes.

Acknowledgments

We thankful to Dean, PVNRTVU, Rajendranagar, Hyderabad, 500030 for providing the facilities in the clinics and laboratory to conduct this work.

REFERENCES

- Ageyi, A., Modonkor, D. and Osei-somuah, A (2004) Concurrence of Eimeria and helminth parasitic infections in West African dwarf kids in Ghana. *Small Rum. Res.* **51**: 29-35.
- Ahmed, M.I., Ambali, A.G. and Baba, S.S. (2006) Haematological and biochemical responses of Balami sheep to experimental Fasciola gigantica infection. *J. Food, Agri. Environ.* **42**: 71-74.
- Amulya, G., Sudharani, R., Ismail Shareef, M. and Gopinath, S.M. (2014) Haemato-Biochemical changes in sheep suffering from gastrointestinal parasitism. *The Indian J. Field Vets.* **10**: 20-22.
- Bhat, M.S., Sudhan, N.A. and Mir, A.Q. (2004) Haematobiochemical Studies in sheep infected with natural gastrointestinal namatodiasis. *Indian J. Vet. Med.* **24**: 76-78.
- Foreyt, W.J. (1990) Coccidiosis and cryptosporidiosis in sheep and goats. *Vet. Clin. North Am. Food Anim. Pract.* **6**: 655-670.
- Gadelhaq, S.M., Arafa, W.M. and Aboelhadid, S.M. (2015) Molecular characterization of Eimeria species naturally infecting Egyptian Baldi chickens. *Iran. J. Parasitol.* **10**: 87-95.
- Gupta, R.P., Yadav, C.L. and Ghosh, J.D. (1985) Epidemiology of helminth infections in calves of Haryana State, India. *Agril. Sci. Dig.* **5**: 53-56.
- Koudela, B. and Bokova, A. (1998) Coccidiosis in goats in the Czech Republic. *Vet. Parasitol.* **76**: 261-267.
- Kumar, S., Jakhar, K.K., Singh, S., Potliya, S., Kumar, K. and Pal, M. (2015) Clinico-pathological studies of gastro intestinal tract disorders in sheep with parasitic infection. *Vet. World* **8**: 29-32.
- Kusiluka, L.J.M., Kambarage, D.M., Harrison, L.J.S., Daborn, C.J. and Matthewman, R.W. (1998) Causes of morbidity and mortality in goats in Morogoro district, Tanzania: the influence of management. *Small Rum. Res.* **29**: 167-172.
- Maiti, S.K., Rao, V.N. and Ali, S.L. (1999) Clinico haematological and therapeutic studies in parasitic gastroenteritis in sheep. *Indian Vet. J.* **76**: 435-437.
- Majeed, Q.A., Alazemi, M.S., Henedi, A.A. and Tahrani, L.M. (2015) Study on parasites from farm animals in Kuwait. *J. Egypt. Soc. Parasitol.* **45**: 71-74.
- Otesile, E. B., Fagbemi, B.O. and Adeyemo, O. (1991) The effect of *Trypanosoma brucei* infection on serum biochemical parameters in boars on different planes of dietary energy. *Vet. Parasitol.* **40**: 207-216.



- Perry, B.D., Randolph, T.F., McDermott, J.J., Sones, K.R. and Thornton, P.K. (2002) Investing in animal health research to alleviate poverty. International Livestock Research Institute (ILRI), Nairobi, pp 148.
- Radostits, O.M., Blood, D.C. and Gay, C.C. (1994) Veterinary Medicines. 8th Edn., Bailliere Tindal, London, pp. 1223-1272.
- Ratanapob, N., Arunvipas, P., Kasemsuwan, S., Phimpraphai, W. and Panneum, S. (2012) Prevalence and risk factors for intestinal parasite infection in goats raised in Nakhom Pathom Province, Thailand. *Trop. Anim. Health Prod.* **44**: 741-745.
- Risso, A., Kessler, J.D., Soriano, V.S., Nunes, M.L.A., Machado, G., Langaro, A., Rossetto, R., Zuffo, T., Dallago, M. and Castro, P. (2015) Influence of pathological conditions caused by gastrointestinal parasites infection on pregnant ewe's behavior. *Acta Sci. Vet.* **43**: 1283.
- Sharma, P., Sharma, D., Dogra, P.K. and Mandial, R.K. (2014) Comparative efficacy of fenbendazole and oxclozanide-tetramisole combination against gastrointestinal nematodes in naturally infected Gaddi goats. *Vet. Res. Int.* **2**: 15-17.
- Singh, A.K., Das, G., Roy, B., Nath, S., Naresh, R. and Kumar, S. (2015) Prevalence of gastrointestinal parasitic infections in goat of Madhya Pradesh, India. *J. Parasit. Dis.* **39**: 716-719.
- Snedecor, G. and Cochran, W.G. (1994) Statistical Methods. 7th Edn. Allied Pacific (P) Ltd., Bombay, India.
- Tanwar, R.K. and Mishra, S. (2001) Clinico-Haemato-biochemical studies on intestinal helminthiasis in poultry. *Vet. Pract.* **2**: 137-140.
- Tariq, K.A., Chisti, M.Z., Ahmad, F. and Shawl, A.S. (2008) Epidemiology of gastrointestinal nematodes of sheep managed under traditional husbandry system in Kashmir valley. *Vet. Parasitol.* **158**: 138-143.