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ORIGINAL RESEARCH

Effect of fenbendazole on growth promotion in Mecheri lambs

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Abstract

Aim: The objective of the study was to find out the effect of fenbendazole on the growth promotion in stunted mecheri lambs.

Materials and methods: The study was conducted with three groups of ten mecheri lambs each. Group I served as untreated control and group II and III were treated with fenbendazole @ 5 mg/kg body weight and 7.5 mg/kg body weight, respectively. All the lambs were subjected to haemato-biochemical observations, body weight recording and collection of faeces for egg counting before and after the treatment.

Results: Fenbendazole in both the doses had beneficial effect on haemato-biochemical observations like haemoglobin, total erythrocyte count, total protein, albumin, aspartate aminotransferase and alanine aminotransferase besides showing efficacy as an anthelmintic. The drug also increased body weight gain significantly at higher dose as compared to untreated control.

Conclusion: The results support that fenbendazole has the potential for modulating growth of stunted mecheri lambs.

Keywords: egg per gram, fenbendazole, haemato-biochemical observations, Mecheri lambs

Introduction

Internal parasites, particularly gastro intestinal nematodes of sheep and goats can cause irreversible damage or even death to the animal. They cause reduced performance and economic loss to the farmers. Mecheri sheep is one of the best mutton breeds of India and is widely distributed in semi-arid region of north-western part of Tamil Nadu namely Salem, Erode and parts of Dharmapuri and Namakkal districts [1]. However, parasite load severely affects growth of Mecheri sheep, particularly lambs. It has been shown that some of the anthelmintics not only eliminates parasitic load and also improves the growth rate of stunted animals considerably [2]. The benzimidazole group of drugs is most widely used for small ruminants and the number of nematode species responsive to the anthelmintic effect of the benzimidazoles is impressive [3]. Hence an experimental farm trial was conducted to study the effect of fenbendazole, a benzimidazole group of drug, on the growth promotion in mecheri lambs with stunted growth.

Materials and Methods

A total of thirty mecheri lambs with reduced growth rate, aged about 5 months, were selected in an organized farm of Tamil Nadu for the present study. All the selected lambs were randomly divided into three groups of ten animals each. Group I lambs served as untreated control. Group II lambs were drenched with fenbendazole @ 5 mg/kg body weight and group III lambs were drenched with 7.5 mg/kg body weight. All the animals were subjected to body weight recording, haematological observations such as haemoglobin, total erythrocyte count, as per the method described by Jain [4] and serum biochemical observations such as total protein, albumin, aspartate amino transferase, alanine amino transferase were estimated using span diagnostic kits. Eggs per gram (EPG) were counted as per method described by Soulsby [5].

The collection of samples was made in this farm trial as per the Institutional Animal Ethical Committee guidelines of Tamil Nadu Veterinary and Animal Sciences University.

The observations were made prior to the start of the trial and final recordings were taken on 30th day after the treatment. The results of the study were analysed statistically by employing't' test [6].

Results

In the present study, the mean Egg Per Gram (EPG) of faeces observed was 1266.6, 1300 and 1385 in group I, II and III respectively (Table-1) before treatment with fenbendazole. A significant reduction ($P<0.05$) in the eggs per gram of faeces was noticed in group II (94.16%) and III (96.41%) when compared with control group in 30 days after treatment with fenbendazole.

The haematological observations resulted in significant increase ($P<0.05$) in the levels of Hb (8.98 ±0.23 and 9.14±0.51) and TEC (9.44± 0.21 and 10.12 ±0.18) in second and third group of lambs, respectively when compared to control group (7.98±0.24 and

Table-1. Egg Per Gram of faeces in fenbendazole treated mecheri lambs

Groups	EPG Count		% Efficacy
	Initial	Final	
I	1266.60 ±55.78	1375.00±55.90	-08.56
II	1385.00±26.50	80.84±12.24*	94.16
III	1300.00±57.74	46.67±16.67*	96.41

*p<0.05

Table-2. Haemato-biochemical observations in mecheri lambs treated with fenbendazole

Parameters	Group I		Group II		Group III	
	Initial	Final	Initial	Final	Initial	Final
Body weight (Kg)	5.27±0.07	6.27±0.19	5.60±0.16	7.50±0.31	6.20±0.28	9.64±0.33*
Haemoglobin (%)	7.57±0.18	7.98±0.24	7.68±0.12	8.98±0.23*	7.84±0.21	9.14±0.51*
TEC (x10^6 cmm)	8.39±0.18	8.66±0.22	8.52±0.16	9.44±0.21*	9.45±0.81	10.12±0.18*
Total protein (g/dl)	5.62±0.26	6.03±0.12	5.5±0.12	6.45±0.21*	4.9±0.53	5.84±0.24*
Albumin (g%)	4.45±2.4	4.36±2.02	4.28±1.8	1.4±1.02*	3.96±1.4	1.9±1.02*
AST (IU/ml)	30.2±0.8	32.7±0.21	27.2±0.7	20.12±5.7*	32.12±5.7	27.92±0.7*
ALT (IU/ml)	21.4±0.25	24.6±0.71	18.9±0.2	12.9±0.2*	15.60±0.3	15.11±0.6*
EPG (Nos/g)	1266.6 ±55.78	1375±55.90	1300±57.74	16.67±16.67*	1385±26.50	21.84±12.24*

*p<0.05

8.66±0.22) in 30 days after treatment (Table-2). The biochemical observations resulted in significant increase (P<0.05) in the level of total protein (6.45± 0.21 and 5.84±0.24) in lambs of Group II and III, respectively when compared to control group (6.03± 0.12) and significant decrease (P<0.05) in the levels of albumin (1.4±1.02 and 1.9±1.02), aspartate amino transferase (20.12±5.7 and 27.92±0.7) and alanine amino transferase (12.9±0.2 and 15.11±0.6) in lambs of group II and III, respectively when compared to control group (4.36±2.02, 32.7±0.21and 24.6±0.71) (Table-2).

The body weights of the lambs of group I and II did not change significantly in 30 days after treatment whereas the body weight of lambs of group III improved significantly (Table-2).

Discussion

In the present study, the reduction in the EPG of faeces shows the efficacy of fenbendazole as an anthelmintic [7]. The effect on helminths is attributed to the action on microtubule polymerization [8]. The increase in haemoglobin and total erythrocyte count indicate the restoration of blood and biochemical entities through haemopoeisis in the circulatory system [9]. The improvement in haemato-biochemical observations (Hb, TEC, AST and ALT)in our study is positively correlated with growth performance [10]. The results of haemato-biochemical observations in our study are also in agreement with the report of Ameen et al [11] with West African Dwarf (WAD) sheep.

The increase in body weights of lambs of group III was in agreement with Cabaj *et al* [3] who reported the heaviness in the body weight of fenbendazole-drenched Romney lambs of Newzealand and suggested that the weight gain was not related to the effect of fenbendazole on growth promoting hormones tested in their study whereas recent study also suggested that fenbendazole could modulate the growth factors responsible for tumorogenesis [12] because of its inhibitory action on microtubules.

Conclusion

The obtained results from haemato-biochemical observations in addition to the results of eggs count support that fenbendazole has the potential for improving growth, which is one of the important non-genetic economic traits of mutton breeds.

Author's contribution

All authors contributed equally. All authors read and approved the final manuscript.

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Competing interests

Authors declare that they have no competing interests.

References

1. Thiruvenkadan, A.K., Karunanithi, K., Muralidharan, J.and Narendra Babu, R. (2011). Genetic analysis of Pre-weaning and Post weaning growth traits of Mecheri Sheep under Dry Land Farming Conditions. *Asian-Aust. J. Anim. Sci.*, 24 (8): 1041-1047.
2. Ravindra Reddy, Y., Shyama sundar, N. and Viroji Rao, S.T. (2006). Effect of oral ivermectin on growth rate in sheep. *Indian Vet. J.*, 83: 234.
3. Cabaj, W., Stankiewiez, M., Jones, W.E. and Moore, L.G. (1994). Fenbendazole and its effect on the immune system of the sheep. *NZ Vet J.*, 42: 216-220.
4. Jain, N.C. (1986). Schalm's Veterinary hematology, 4th Edn., Lea and Febiger, Philadelphia, U.S.A.
5. Soulsby, E.J.L. (1982). Helminths, Arthropods and protozoa of domesticated animals, 7th Edn., Bailliere, Tindall and Cassell, London.
6. Snedecor, G.W. and Cochran, W.G. (1994). Statistical Methods, 6th Edn., IOWA State University Press, Ames, Iowa.
7. Chodhury, M. (2004). Efficacy of fenbendazole against trichuriasis in crossbred cattle. *Indian Vet. J.*, 81: 977-978.

8. Ping Gao, Dang, Chi.V. and Watson Julie. (2008). Unexpected anti tumorogenic effect of fenbendazole when combined with supplementary vitamins. *J Am Assoc Lab Anim Sci*., 47(6): 37-40.
9. Oyerinde, J.P.O. (1980). Laboratory diagnosis of hook worm disease; problems and prospects. *Nig. J. Parasitol*., 1: 138-155.
10. Hossain, F.M.A., Hasnath, M.R., and Kabir, M.S. (2011). Haematobiochemical dynamics and body weight gain of black Bengal goat following urea molasses block (UMB) supplementation , *Online J. Anim. Feed Res.*, 1(5): 182-185.
11. Ameen, S.A., Sdedeji, O.S., Ojedapo, L.O., Salihu, T. and Fabusuyi, C.O. (2010). Anthelmintic Potency of Pawpaw (Carica papaya) seeds in West African Dwarf (WAD) Sheep. *Global Veterinaria*, 5(1): 30-34.
12. Duan, Qiwen, Liu, Yanfeng, Booth, Carmen, J., Rockwell, Sara.(2012). Use of fenbendazole containing therapeutic diets for mice in experimental cancer therapy studies, *J Am Assoc Lab Anim Sci*., 1(2): 224-230.

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