



DOI Number: 10.5958/2277-940X.2015.00050.9

Comparative Study of Efficacy of Fenbendazole and Ivermectin against *Haemonchus contortus* in Goats of Jammu region

Shikha Sharma¹, Sahil Kumar^{1*}, Javid Farooq² and Rajesh Katoch¹

¹Division of Veterinary Parasitology, F.V.Sc & A.H., SKUAST-J, R.S.Pura, Jammu, INDIA

²Division of Animal Nutrition, F.V.Sc & A.H., SKUAST-J, R.S.Pura, Jammu, INDIA

*Corresponding author: S Kumar; Email: jimmysns@gmail.com

Received: 12 February, 2015

Accepted: 24 April, 2015

ABSTRACT

Parasitic disease constitutes 60-70% diseases affecting the animals and has serious economic implication in livestock entrepreneurship by direct and indirect production loss. Indiscriminate use of anthelmintic drugs has made the situation even more precarious. A similar problem was encountered in goat farm of SKUAST-Jammu, where goats with constant complain of diarrhoea and loss of body condition was reported despite of routine deworming. The present study was therefore conducted with the objective of determining the efficacy of conventional dewormer used and its comparison with some unexploited antiparasitic drug for the same reason. Twenty seven goats with above said problem were divided into three groups after qualitative examination Group I was treated with ivermectin at dose rate of 0.2 mg per kg body weight orally. Group II was treated with fenbendazole @5 mg/kg body weight orally and Group III goats were kept as untreated control. Quantitative examination for EPG was conducted on day 0, 7 and 14 by Stoll's technique. FECRT percentage revealed 100% efficacy of ivermectin @ 0.2mg/kg b.wt. whereas FECRT percentage in fenbendazole treated group was found to be 57.44% on day 7 and 70.87% on day 14 post treatment. Coproculture revealed presence of only *H. contortus* larvae, post treatment. The study revealed low efficacy of fenbendazole and hence ivermectin is the better drug than fenbendazole to control GIT nematodes.

Keywords: FECRT, Fenbendazole, *Haemonchus contortus*, Ivermectin, Goats

Helminth parasites are a major cause of economic loss in ruminants throughout the world. It accounts for 5-10% mortality and 10-20% morbidity losses in ruminants (Herlich, 1978). Extensive use of anthelmintics that too in inadequate dose has resulted in emergence of antihelmintic resistant strains of parasites (Silvestre *et al.*, 2002; Wolstenholme *et al.*, 2004). There are numerous reports of antihelmintic resistance from various parts of India (Ram *et al.*, 2007; Buttar *et al.*, 2012; Rialch *et al.*, 2013). Khajuria (2010) has also reported the benzimidazole resistance in sheep and goats of Jammu. The objective of present study was to find out the comparative efficacy of fenbendazole and ivermectin against *Haemonchus contortus* in goats, maintained at Sher-e-Kashmir University of Agriculture Sciences and Technology-Jammu (SKUAST-J) farm based on faecal egg count reduction test (FECRT).

MATERIALS AND METHODS

Twenty seven goats of either sex weighing in a range of 20-25 kg body weight and age group between 5-6 years were presented to the Division of Veterinary Parasitology, SKUAST-J with symptoms of diarrhoea, poor body weight gain, anorexia and anaemia. These goats were bought to the farm at the age of six month to one year and since then they were treated with fenbendazole after every two month interval as their grazing area is heavily contaminated with nematode infection. Qualitative examination of faeces from all the goats revealed heavy presence of strongly eggs. The goats were randomly divided into three groups with nine goats each. Group I was treated with ivermectin (Hitek, Virbac animal health) at dose rate of 0.2 mg per kg body weight orally. Group II was treated with fenbendazole (Panacure, Intervet) @5 mg/kg body



weight orally and Group III goats were kept as untreated control. All the goats were kept under stall fed condition during study period. Faecal samples were collected per rectum on day 0, 7 and 14. The samples were examined quantitatively for EPG (egg per gram) by stoll's technique (Soulsby, 1982). Faecal culturing of pre treatment and post treatment samples were done to determine the percent of different strongyle worm's larvae. Faecal egg count reduction percentage was determined by using arithmetic mean count (Coles *et al.*, 1992). Resistance will be considered if faecal egg count reduction is less than 95% and 95% confidence limit is less than 90%.

RESULTS AND DISCUSSION

Table 1. Efficacy of ivermectin and fenbendazole against natural strongyle infection in goats

Drug		Day 0	Day 7	Day 14
Ivermectin (group I)	AM	2008	0	0
	SE	213.2	-	-
	R%	-	100	100
	LCL%	-	100	100
	UCL%	-	100	100
Fenbendazole (group II)	AM	1974.4	509.5	622.3
	SE	-	41.17	42.7
	R%	-	57.44	70.87
	LCL%	-	47.91	64.69
	UCL%	-	65.17	76
Control (group III)	AM	1913	1197	2138.3
	SE	69.74	53.77	120.79
	R%	-	-	-
	LCL%	-	-	-
	UCL%	-	-	-

AM = Arithmetic mean, SE=Standard error, R%= Reduction percent, LCL%= Lower confidence limit, UCL%= Upper confidence limit.

The detailed result of the study is depicted in table 1. The pre treatment copro culture studies revealed predominance of *Haemonchous contortus* (95.33%). Whereas in fenbendazole treated group, faecal culture revealed the

presence of *H. contortus* larvae only. The ivermectin treated group revealed 100% reduction in faecal egg count. However, in fenbendazole treated group faecal egg count reduction percent was found to be 57.44% and 70.87% on day 7 and 14 post treatment respectively, suggesting the low efficacy of fenbendazole against strongyle worms. In fenbendazole treated group the results are in accordance with that of Hong *et al.*, (1996); Saddiqui *et al.* (2006); Sissay *et al.* (2006); Khajuria, (2010) and Rialch *et al.* (2013) which reported higher resistance of *H. contortus* to benzimidazole groups than other GIT nematodes. The low efficacy of fenbendazole has already been reported by Bogan *et al.* (1987); Yadav, (1990); Singh *et al.* (2002) and Waruiru *et al.* (2003). Fenbendazole resistance in goats could be due to its extensive and indiscriminate use against nematodes for many years (Meenakshisundaram *et al.* 2014; Varadharajan and Vijayalakshmi, 2015).

Study concluded that use of fenbendazole for treatment of GIT nematodes should be discouraged and use of ivermectin should be advocated as it is highly effective and has not been exploited in Jammu region.

ACKNOWLEDGEMENTS

Authors are highly thankful to all the faculty members of Veterinary Parasitology and Animal Nutrition department for providing facilities required for conducting research

REFERENCES

- Bogan, J., Benoit, E. and Delatour, P. 1987. Pharmacokinetics of oxfendazole in goats: a comparison with sheep. *J. Vet. Pharmacol. Therap.*, **10**: 305-309.
- Buttar, B.S., Rai, H.S., Singh, N.K., Jyoti, Haque, M. and Rath, S. 2012. Emergence of anthelmintic resistance in an organized sheep farm in Punjab. *J. Vet. Parasitol.* 26(1):69-71.
- Coles, G.C., Bauer, C., Borgsteede, F.H.M., Greats, S., Klei, T.R. and Taylor, M.A. 1992. World Association for the Advancement of Veterinary Parasitology (W.A.A.V.P.) methods for the detection of anthelmintic resistance in nematodes of veterinary importance. *Vet. Parasitol.*, **44**: 35-44.
- Herlich, H. 1978. The importance of helminth infections in ruminants. *World Anim. Rev.*, **26**: 22-26.
- Hong, C., Hunt, K.R. and Coles, G.C. 1996. Occurance of anthelmintic resistant nematodes on sheep farm in England and in goat farm in England and in Wales. *Vet. Rec.*, **139** (4): 83-86.

- Khajuria, J.K. 2010. Studies on epidemiology and resistance against benzimidazoles in gastro intestinal nematodes of small ruminants, PhD thesis submitted to SKUAST-J, Jammu, 1-69.
- Meenakshisundaram, A., Anna, T. and Harikrishnan, J. 2014. Prevalence of drug resistant gastrointestinal nematodes in an organized sheep farm, *Vet. World*, **7(12)**: 1113-1116.
- Ram, H., Rasool, T.J., Sharma, A.K., Meena, H.R. and Singh, S.K. 2007. Comparative efficacy of different anthelmintics against fenbendazole resistant nematodes of pashmina goats. *Vet. Res. Commun.*, **31**: 719-723
- Rialch, A., Vatsya, S. and Kumar, R.R. 2013. Detection of benzimidazole resistance in gastrointestinal nematodes of sheep and goats of sub himalyan region of northern India using different tests. *Vet. Parasitol.*, **198**: 312-318.
- Saddiqui, A.H., Jabbar, A., Iqbal, Z., Babar, W., Sindhu, Z. and Abbas, R.Z. 2006. Comparative efficacy of five nematodes against *Trichostrongyloid* nematodes in sheep on a Kenyam farm. *Canad. J. Anim. Sci.*, **86**: 471-477.
- Silvestre, A., Leignel V., Berrag, B., Gasnier, N., Humbert, J.F., Chartiere, C. and Cabaret, J. 2002. Sheep and goat nematode resistance to anthelmintics: pro and cons among breeding management factors. *Vet. Res.*, **33**: 465-80.
- Singh, D., Swarnkar, C.P. and Khan, F.A. 2002. Anthelmintic resistant in gastrointestinal nematodes of livestock in India. *J. Vet. Parasitol.*, **16**:115–130.
- Sissay, M.M., Asefa, A., Vagla, A. and Walles, P.J. 2006. Anthelmintic resistance of nematode parasites of small ruminants in eastern Ethiopia: exploitation of refugia to restore anthelmintic efficacy. *Vet. Parasitol.*, **135**: 337-346.
- Soulsby, E.J.L. 1982. Helminths, Arthropods and Protozoa of domesticated animals, 7th edition. The English language Book Society, BailliereTindall, London.
- Varadharajan, A., Vijayalakshmi, R., 2015. Emergence of anthelmintic resistance in naturally infected goats in Tamil Nadu, India, *Onl. J. Vet. Res.*, **19(2)**: 102-107.
- Waruiru, R.M., Ngotho, J.W., Mutune, M.N. and Munyua, W.K. 2003. Comparative efficacy of ivermectin, albendazole, levamisole and rafoxanide against gastrointestinal nematode infections in goats. *Indian J. Anim. Sci.*, **73**:147–150.
- Wolstenholme, A.J., Fairweather, I., Prichard, R., von Samson-Himmelstjerna, G. and Sangster, N.C. 2004. Drug resistance in veterinary helminthes. *Trends in Parasitol.*, **20**:469–476.
- Yadav, C.L. 1990. Fenbendazole resistance in *Haemonchous contortus* of sheep. *Vet. Rec.*, **126**: 586.

