

*Original Research***Assessment of Anthelmintic Resistance against Strongylosis in Goats****Yashoda Rathod*, Vivek R. Kasaralika, B. G. Ravindra, U. Sunilchandra¹, S. C. Halmandge and N. A. Patil**

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Abstract

The aim of present study was to assess the anthelmintic resistance against strongylosis in goats in and around Bidar district of Karnataka state. Anthelmintic resistance in goats affected with strongylosis was assessed according to Faecal Egg Count Reduction test (FECRT). Faecal samples were collected on 0, 7th and 14th day after treatment and faecal egg per gram (EPG) was determined by modified Gordon and Whitlock technique. FECR values were reduced significantly on 7th and 14th day in comparison with day '0'. However, the FECR percentage was highest in Group which was treated with Levamisole. Hence Levamisole was found to be effective in eliminating strongyles in goats with higher FECR percentage of 96.85 per cent whereas, FECR less than 90 per cent with fenbendazole and ivermectin suggestive of developing resistance in strongylosis of goats in and around Bidar.

Key words: Anthelmintic Resistance, EPG, FECRT, Goats, Strongylosis**How to cite:** Rathod, Y., Kasaralika, V., Ravindra, B., Sunilchandra, U., Halmandge, S., & Patil, N. (2019). Assessment of Anthelmintic Resistance against Strongylosis in Goats. International Journal of Livestock Research, 9(7), 111-115. doi: 10.5455/ijlr.20190408051002**Introduction**

The small ruminants have enormous potential to boost economy of our country and are a major source of income especially to marginal farmers and landless labourer. Gastrointestinal nematodes have been recognized as a major factor limiting goat production throughout the world. Control of gastrointestinal nematodes is predominantly based on the use of anthelmintic drugs. Anthelmintics have a pivotal role in minimizing the negative effects of nematodes worldwide. However, indiscriminate and frequent use of same drugs has resulted in the emergence of anthelmintic resistance against most of the major classes of anthelmintics in several countries (Coles *et al.*, 2006). High frequency of treatment with improper dosage

in conjunction with administration of the same chemical group to young and adult animals and longer persistence at low level of the therapeutic activity of the compound also contribute for the development of anthelmintic resistance.

Anthelmintic resistance in goats against strongylosis has not been reported in and around Bidar. Hence, an attempt was made to study the anthelmintic resistance against strongylosis in goats.

Materials and Method

The present investigation was carried out in the Department of Veterinary Medicine, Veterinary College, Bidar for a period from April 2016 to March 2017.

Selection of Animals

Animals were selected after initial screening and divided into 3 groups containing 30 animals in each group for the assessment of anthelmintic resistance.

Collection and Analysis of Faecal Sample

Five grams of faecal sample was collected directly from the rectum of each goat in a clean polythene bag and was examined by direct smear. From each group samples were pooled to count strongyle eggs per gram of faeces (EPG) using Modified Gordon and Whitlock technique for the group using Mc Master slide. Mean EPG was counted on 0th day (before treatment) and faecal egg count reduction (FECR) was examined on 7th and 14th day after treatment.

Anthelmintic Resistance Assessment Trial

Ninety goats with strongylosis were selected for the present study and randomly divided into 3 groups, consisting of thirty animals in each group. Group I received Fenbendazole (Panacur[®]VET) @ 7.5 mg/kg b.wt per oral, Group II received Ivermectin (Trumectin[®]) @ 200µg/kg b.wt per oral and Group III received levamisole (Nilverm[®]) @ 7.5 mg/kg b.wt per oral as a single dose.

Anthelmintic Resistance Detection

Anthelmintic resistance status was evaluated by FECRT based on method described by the World Association for the Advancement of Veterinary Parasitology (WAAVP) guidelines (Mc Kenna, 2006). The FECRT has been the most recommended method so far being broadly utilised for field or research studies (Coles *et al.*, 1992). FECRT assesses the anthelmintic resistance of a compound by comparing worm egg counts from animals before and after treatment.

$$FECR = 100 * (1 - [T2/T1]) \quad (\text{Mc Kenna, 2006 and Singh } et al., 2017)$$

T1 and T2 indicate the mean pre- and post- treatment faecal egg counts (EPGs) respectively.

Statistical Method

Statistical analysis of data was carried out by employing ONE and TWO-WAY ANOVA, as per Snedecor and Cochran (1994). Statistically significant difference was considered at 5 per cent level.

Result and Discussion

The assessment of fenbendazole, ivermectin and levamisole resistance in present study was analysed by comparing reduction of arithmetic mean faecal EPG counts between 0 day as pre-treatment and on 7th and on 14th day as post-treatment.

Faecal Egg Count Reduction

The reduction in the faecal egg count (FECR) in all the treated group was measured on 7th day and 14th day post treatment. The FECR percentage was 66.77, 79.45 and 81.10 per cent on 7th day post-treatment and 85.36, 88.90 and 96.85 per cent on 14th post-treatment Group I, Group II and Group III respectively as shown in Table 1. These FECR values were reduced significantly ($P \leq 0.05$) on day 7th and day 14th in comparison with day '0'. However, the faecal egg count reduction was highest in Group III which was treated with Levamisole hydrochloride.

Table 1: Mean \pm SE values of eggs per gram (EPG) and Faecal Egg Count Reduction Percentage (FECR %) after anthelmintic treatment in goats affected with strongylosis

Parameters	Day	Group I	Group I	Group III
EPG	0 (BT)	10933 \pm 2167.44 ^e	6000 \pm 709.46 ^d	4233 \pm 1516.94 ^{cd}
	7 (AT)	3633 \pm 371.18 ^{bcd} (66.77)	1233 \pm 202.76 ^{ab} (79.45)	800 \pm 208.17 ^{ab} (81.1)
	14 (AT)	1600 \pm 57.74 ^{abc} (85.36)	666 \pm 120.19 ^{ab} (88.9)	133 \pm 33.33 ^a (96.85)

Fig. in parenthesis indicate percent reduction in faecal egg count; * Mean values bearing different superscript differ significantly ($P \leq 0.05$)

Overall faecal egg count reduction was 85.36 per cent on 14th day after treatment with Fenbendazole. The findings of the therapeutic trial in the present study are comparable to that of Mukaratirwa *et al.* (1997) who has reported the percentage faecal egg count reduction for fenbendazole was 83.34 per cent on 14th day post treatment in sheep thus indicating resistance to fenbendazole. Similarly, Buttar *et al.* (2012) recorded 84.17 per cent of FECR percentage in sheep treated with fenbendazole on 10th day post treatment thus suggesting development of resistance against fenbendazole. Overall faecal egg count reduction in Group II treated with Ivermectin was 88.90 per cent on 14th day after treatment. Bersissa and Girma (2009) reported that faecal egg count reduction percentage was 71.00, 78.00 and 76.00 per cent in young, adult male and adult female goats respectively on 12th post treatment thus indicating presence of anthelmintic resistance against ivermectin in all the age groups of goats.

However, an overall faecal egg count reduction of 96.85 per cent on 14th day after treatment in Group III treated with Levamisole. Hence, it is concluded from the present investigation that Levamisole hydrochloride should be preferred anthelmintic over Fenbendazole and Ivermectin in the treatment of strongylosis of goats in and around Bidar. The findings of the present study are in accordance with the observations of Jaiswal *et al.* (2013) who has reported 97.59 per cent of faecal egg count reduction with levamisole on 14th post treatment against strongylosis in goats.

Conclusion

Among Fenbendazole, Ivermectin and Levamisole used for treatment of strongylosis in goats, Levamisole was found to be effective in eliminating strongyles in goats with higher faecal egg count percentage of 96.85 per cent whereas, FECR less than 90 per cent with fenbendazole (85.36%) and ivermectin (88.90%) suggestive of developing resistance in strongylosis of goats in and around Bidar.

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