



RESEARCH
ARTICLE

Incidence of gastrointestinal helminth parasites in goats and their therapeutic management

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Abstract : As per faecal examination the incidence of gastrointestinal helminth parasite infection in goats was 80 per cent. The percentage of infections was highest in monsoon season followed by winter and summer season. Susceptibility to the infection was highest in older age groups (>24 months age) followed by adult goat (12.1-24 months age) and kid (1-12 months age). The infection percentage in female is slightly high as compared to the male goats due to maintenance and production stress. Majority of the goats were suffering from mix infection of *Haemonchus* species, *Trichostrongylus* species, *Stongyloides* species, *Oesophagostomum* spp., amphistomes and *Fasciola* spp. with some cases of *Trichuris* spp., *Bunostomum* spp. and *Moniezia* spp. Ivermectin and Clorsulon was found to be most effective for the treatment of gastrointestinal nematode parasites as compared to Closantel and Fenbendazole.

Key words : Helminth, Parasites, Anthelmintic drugs

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INTRODUCTION

A gastrointestinal helminth parasite causes great economic loss in term of decreased growth rate, productivity and mortality in small ruminants. Goats are more susceptible to various gastrointestinal helminth parasites infection due to its grazing habits. For the treatment of severe worm load and anaemic condition there is requirement of more potent anthelmintic and supportive therapy. Many gastrointestinal helminths developed resistance against anthelmintic drugs and the drugs are not effective to control the worm infection, lead to high mortality in infected goats. Hence, the present study was conducted to ascertain the incidence of gastrointestinal helminth infection in goat and its therapeutic management.

RESEARCH METHODOLOGY

About 400 fecal samples from clinically suspected goats were collected from the surroundings of Patna district

of Bihar from March 2014 to February 2015. The record of season, age, sex, and rearing system of suspected goats were observed. The goat's faecal samples investigated in major three seasons *i.e.* summer (Mar.14-Jun. 14), monsoon (Jul. 14 - Oct. 14) and winter (Nov.14-Feb.15). The examination of faecal samples was done by direct smear and Flotation methods.

For therapeutic trials, thirty naturally infected goats with mix nematode worms were allocated in to three groups A, B and C, having 10 animals in each group. Goats of group A were treated with Fenbendazole @ 7.5 mg/kg body weight orally, Group B with the combination of Ivermectin and Clorsulon @ 1 ml/50 kg body weight s/c and Group C with Closantel @ 10 mg/kg body weight orally. All goats were given identical supportive medicines like B-complex inj. @ 3 ml/adult goat, Iron Tonic Inj. @ 1 ml/50kg body weight i/m (Iron Sorbitol Citric Acid, Elemental Iron, Folic Acid and Hydroxycobalamin), Iron tonic orally @ ½ bolus/adult goat daily (Ferrous Fumerate, Vit B₁₂ and Folic Acid), Colloid I/V.

Solution @ 100-200 ml as per severity of the case (Dextrose, Sod. Chloride, Pot. Chloride, Cal.Chloride and Sodium Lactate Solution). Diarrhoeic goats were also treated with the combination of Ciprofloxacin and Tinidazole tablets orally @ 1 tab/15 kg body weight for 3-5 days.

Faecal samples were collected from infected goats on 0-day before the treatment and after the treatment on 7th, 14th and 21st day post-treatment for egg count to evaluate the comparative efficacy of the drugs. The EPG was counted by Mac-Master chamber method and per cent efficacy of drug was calculated as per the formula :

$$\text{Per cent efficacy} = \frac{\text{Pre - treatment EPG} - \text{Post - treatment EPG}}{\text{Pre > treatment EPG}} \times 100$$

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

A total of 400 faecal samples were collected for the examination, out of which 320 (80%) faecal samples were found positive for gastrointestinal helminthes worms infection (Table 1). Bhojane *et al.* (2002) also recorded overall 70 per cent helminthic infection in goats in Nagpur.

A total of 93 faecal samples were examined in summer, out of which 59 (63.44%) samples were found positive for worms infection and 110 faecal samples were investigated in monsoon season out of which 101(91.81%) goats were found affected with worms infection. Similarly, 197 faecal samples of goats were examined in winter season, out of which 160 (81.21%) faecal samples were found positive for different worms infection (Table 1).

In present study the lowest rate of the infection was noted in summer season. On account of Radostits *et al.* (2007) the life span of infective larvae is shorter at higher temperature as food stores are used more quickly. In present study, the percentage of infections were high in winter season as compared to the summer season, but the percentage of infections were highest in monsoon season as compared to summer and winter season due to high level of humidity and rain fall which is a favourable factor for the prevalence of worms. Radostits *et al.* (2007), also described that *Haemonchus* is predominant in summer rainfall, whereas, the *trichostrongyle* infection is favoured by cool, wet weather occurs in winter at the time of rainfall. Katoch *et al.* (2000) also reported the similar finding and stated about the peak prevalence of G.I. helminths infection in rainy season.

The incidence of worms infection in goats of age group 1-12 months, 12.1-24 months and more than 24 months were observed 71.02 per cent, 80.86 per cent and 84.83 per cent, respectively (Table 1). The investigation reflects

Fecal sample	Season			Age			Sex		
	Summer (Mar-Jun)	Monsoon (Jul-Oct)	Winter (Nov-Feb)	0-12 Months	12.1-24 Months	>24 Months	Male	Female	
Total sample examined	400	93	110	197	107	115	178	150	250
Total sample positive	320	59	101	160	76	93	151	114	206
Per cent (%)	80.0	63.44	91.81	81.21	71.02	80.86	84.83	76.0	82.4

about the high susceptibility to the infection of older age groups (>24 months) as compared to adult and kids because *et al.* (2011) also similarly reported about the older and heavier goats which were more prone to worms infection than younger and lighter goats. The lowest percentage of the worms infection was noted in younger age groups (1-12 months) might be due to strong immunity against the worm infection. The percentage of the infection was high in adult as compared to younger goats might be due to lack of deworming programme.

As per sex-wise investigation, 76.0 per cent and 82.4 per cent worm infection were found in male and female goats, respectively (Table 1). The infection percentage in female is slightly high as compared to the male in present study, might be due to less immunity to the infection caused by production and maintenance stress. Etana-Debela (2002) also reported that female goats harboured higher relative density of nematodes than male.

The microscopic examination of faecal samples of goat were revealed 84.68, 75.62, 58.75, 10.00, 41.56, 4.37, 1.87, 12.18 and 32.18 per cent infection of *Haemonchus* sp., *Trichostrongylus* sp., *Strongyloides* sp., *Trichuris* sp., *Oesophagostomum* sp., *Bunostomum* sp. *Moniezia expansa*, *Fasciola* sp. and Amphiostomes, respectively (Table 2). On account of the above mentioned observation, the most prevalent parasite was *Haemonchus* sp. followed by *Trichostrongylus* sp. and *Strongyloides* sp. The results are similar to the Katoch *et al.* (2000) who detected *Haemonchus* sp., *Oesophagostomum* sp., *Trichostrongylus* sp., *Trichuris* sp. and *Strongyloides* sp. as predominant nematode species in goat's population of Mathura.

The Egg per Gram (EPG) counts of fenbendazole treated goats of group A, decreased from 630 to 175 on 21 day post-treatment (DPT). On the basis of EPG reduction, Fenbendazole treated naturally infected goats of Gr. A, showed 72.22 per cent efficacy on 21 DPT. The EPG counts of Ivermectin and Clorsulon treated goats of group B decreased from 595 to 30 on 21 DPT showed a highest 94.95 per cent of the efficacy. The EPG counts of Closantel treated goats of group C, decreased from 605 to 100 on 21 DPT which revealed 83.47 per cent efficacy.

The lowest percentage of the efficacy of Fenbendazole treated goats of Gr. A was noted. The percentage of the mean post-treatment EPG of Gr. B indicates about the better efficacy of the Ivermectin and Clorsulon because significant difference observed between the mean post treatment EPG per cent on 0 day and 21st day as compared to closantel and Fenbendazole. It might be possible due to the less drug resistance for Ivermectin and Clorsulon

Table 2 : Percentage of infection of different gastrointestinal helminth parasites in goats			
Group of helminth	Name of helminth	No. of positive fecal sample out of 320 positive samples	Percentage of infection (%)
Nematodes	<i>Hemonchus</i> spp	271	84.68
	<i>Trichostrongylus</i> spp	242	75.62
	<i>Strongyloides</i> spp	188	58.75
	<i>Trichuris</i> spp	32	10.00
	<i>Oesophagostomum</i> spp	133	41.56
	<i>Bunostomum</i> spp	14	4.37
Cestodes	<i>Moniezia expansa</i>	6	1.87
Trematodes	<i>Fasciola</i> spp	39	12.18
	Amphiostomes	103	32.18

Table 3 : Comparative efficacy of anthelmintic drugs against gastrointestinal helminth parasites in goats					
Groups (No. of goats)	Name of anthelmintic, dose and route	Pre-treatment EPG (0-day)	Mean post- treatment EPG (%)		
			7 th -day	14 th -day	21-day
A (10)	Fenbendazole @ 7.5 mg/kg body weight orally	630±31.79	510±35.59	355±29.29	175±08.33 (72.22)
B (10)	Ivermectin and Clorsulon, @ 1ml/50 kg body weight s/c	595±24.09	385±24.77	145±17.40	30±08.16 (94.95)
C (10)	Closantel @10 mg/kg body weight orally	605±36.85	435±36.55	255±31.13	100±14.90 (83.47)

¶ Figure in parentheses indicate percentage

combination. Godara *et al.* (2011) recorded that the Fenbendazole were not effective against GI nematodes in goats and injectable Ivermectin could safely be recommended for the treatment of GI nematode parasites of goats. Kumar and Vatsya (2013) observed the combination of ivermectin and clorsulon against mixed infection of gastro-intestinal nematodosis and fasciolosis in goat was effective. The efficacy percentage of Closantel is also high as compared to the Fenbendazole because of very less use of Closantel and wide use of Fenbendazole. Meenakshisundaram *et al.* (2014) estimated the per cent efficacy for Closantel was more than 95 per cent in sheep lamb of farm. Hence, the rotation of anthelmintic are required for the control of gastrointestinal helminth worms and Ivermectin and Clorsulon may be a better drug of choice.

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