Environment & Ecology 35 (2A) : 920—922, April—June 2017
Website : environmentandecology. com ISSN 0970-0420

Prevalence of Gastrointestinal Nematodes and Risk Factors in Goats in Jabalpur

S. Sunandhadevi, M. L. V. Rao, Pooja Dixit, G. Das, P. C. Shukla, A. K. Dixit,

Received 22 June 2016; Accepted 26 July 2016; Published online 10 August 2016

Abstract Gastrointestinal (GI) nematode infections remain one of the main constraints to goat production worldwide. In this study, the prevalence of GI nematodes in goats from the Jabalpur region of madhya Pradesh and the associated risk factors like age, sex and type of management system were determined. The overall prevalence of GI nematodes in goats was 73.15%. Among various GI nematodes, maximum prevalence recorded was of strongyle (68.47%) followed by *Strongyloides* spp. (33.98%) and *Trichuris* spp. (23.14%). Mixed infection of strongyle and *Strongyloides* (13.79%), strongyle and *Trichuris* (5.17%), *Trichuris* and *Strongyloides* (0.98%) and strongyle, Strongyloides and *Trichuris* (16.26%) was also recorded. No significant difference ($p>0.05$) was observed in prevalence of manoinfections (36.95%) and mixed infections (36.20%). Highly significant ($p<0.01$) difference was found in prevalence of GI nematodes in adult (84.44%) as compared to old (64.22%) and young goats (64.10%). The prevalence was significantly higher ($p<0.05$) in female (76.14%) as compared to male (66.11%) goats. Significantly higher ($p<0.05$) prevalence was observed in goats maintained at organized farms (77.73%) as compared to that of non-organized farms (68.20%). The results provided significant data on the epidemiology in Jabalpur which may be helpful for the farmers and veterinarians for control of gastrointestinal nematodes in the study area.

Keywords Gastrointestinal nematodes, Goat, India, Jabalpur, Prevalence.

S. Sunandhadevi*, M. L. V. Rao, Pooja Dixit, P. C. Shukla
Department of Veterinary Medicine,
College of Veterinary Science and Animal Husbandry,
NDVSU, Jabalpur 482001, MP, India

A. K. Dixit, G. Das
Department of Veterinary Parasitology,
College of Veterinary Science and Animal Husbandry,
NDVSU, Jabalpur 482001, MP, India
e-mail : sunandhadevi@gmail.com
*Correspondence

Introduction

Goats play a significant role in creating employment, income, food and nutritional security to the millions of marginal and small farmers and agricultural laborers in countries like ours so called the 'poor man's cow'. India has 135.17 million goats which provide 4.59 million tonnes milk and 0.85 million tonnes meat of which over 8 millions goats are

present in Madhya Pradesh as per 19th livestock census [1]. One of the major threats to economical goat farming is the silent production losses caused by gastrointestinal nematodes [2]. We know that gastrointestinal(GI) nematodes do not individually cause severe life threatening disease but when are superimposed with nutritional deficiencies which is very likely in our country, can result in precipitation of many diseases. Heavy parasitism resulting in hypoproteinemia can lead to immunodeficiency thus decreased resistance to diseases. So the study of parasitic prevalence in an area becomes important.

(The authors are thankful to Dean, Veterinary College, Jabalpur for providing necessary facilities to carry out this work).

Materials and Methods

Jabalpur is located in Agro-climatic Zone III (i.e. Kymore Plateau & satpura Hills) of the state of Madhya Pradesh. Jabalpur has a humid subtropical climate typical of North central India (Madhya Pradesh and Southern Uttar Pradesh). Meteorological information on minimum and maximum temperature (°C), relative humidity (%) and rainfall (mm) were collected from the Agro-meteorology, Department of Physics, College of Agricultural Engineering, JNKVV, Jabalpur. The maximum temperature varied from 25.2° to 41.7° C and minimum 8.0° to 26.2° C. The maximum relative humidity varied from 42-91% and minimum 16—70% with an average annual rainfall of 1574 mm. A total of 406 faecal samples of goats were screened to know the epidemiological pattern of gastrointestinal nematodes in and around Jabalpur, India from December 2015 to may 2016. Freshly laid or rectal faecal samples were collected in an individually labelled polythene bags from the selected animals. These faecal samples were taken to the laboratory at the earliest for further examination. The age, sex, history of deworming, feeding habits and management of the animals were also recorded. Goats were divided into three groups according to their age as young (6 months-1 year), adult (1-3 year) and old goats (>3 year). Modified Sheather's sugar floatation technique was applied for the detection of nematodes eggs [3]. Chi-square test was used for statistical analysis of the data. A *p* value of less than 0.05 was considered significant and less than 0.01 highly significant [4].

Table 1. Prevalence and risk factors associated with gastrointestinal nematodes in goats. Figures in parentheses indicate percentage, *X^2 values were considered significant at $p<0.05$ level.

Factor	Level	Examinated	Prevalence (%)	Degree of freedom	X^2 Value
Age	Young	117	75 (64.10)	2	20.99**
	Adult	180	152 (84.44)		
	old goat	109	70 (64.22)		
Sex	Female	285	217 (76.14)	1	4.35*
	Male	121	80 (66.11)		
Management system	Organized farm	211	164 (77.73)	1	4.68*
	Unorganised farm	195	133 (68.20)		

Results and Discussion

The overall prevalence of GI nematodes in goats was 73.15%. Among various GI nematodes, maximum prevalence recorded was of strongyle (68.47%) followed by *Strongyloides* spp. (33.98%) and *Trichuris* spp. (23.14%) which was in agreement to the findings of Gupta et al. [5]. However, Dixit et al. [6] reported a higher prevalence (98%) in goat kids in Jabalpur. Mixed infection of strongyle and *Strongyloides* (13.79%), strongyle and *Trichuris* (5.17%), *Trichuris* and *Strongyloides* (0.98%) and strongyle, *Strongyloides* and *Trichuris* (16.26%) was also recorded. No significant difference ($p<0.05$) was observed in prevalence of mono-infections (36.95%) and mixed infections (36.20%) of GI nematodes. This is in agreement with the findings of Zeryehun [7]. Such poly-parasitism has earlier been suggested to be an important cause of morbidity and loss of

production in goats [8].

Table 1 depicts age wise, sex wise and management system wise prevalence of GI nematodes in goats. The prevalence of GI nematode was more in adult (84.44%) as compared to old (64.22%) and young goats (64.10%). Age wise difference in prevalence was highly significant ($p<0.01$). Similar finding was earlier reported by Chedge et al. [9]. The prevalence of GI nematodes was higher in female (76.14%) as compared to male (66.11%) goats. Sex wise difference in prevalence was significant ($p>0.05$). Shahnawaz et al. [10] also reported higher prevalence in females. The temporary loss of acquired immunity against GI nematodes near the parturition, the physiological peculiarities of the female animal including stress factors near lactation reduce their immunity to infections, as a result of which they are more susceptible to the infections [11]. Significantly higher ($p<0.05$) prevalence was observed in goats maintained at organized farms (77.73%) as compared to that of non-organized farms (68.20%). Higher prevalence at organized farms was due to emergence of anthelmintic resistat strain of gastro-in testinal nematodes. The most commonly used drugs are benzimidazole anthelmintics. The indiscriminate use of these drugs resulted in the selection of a population of *Haemonchus* contortus resistant to their therapeutic doses [12]. It was concluded that Jabalpur region of Madhya Pradesh state had high prevalence of gastrointestinal nematodes in goats, and age, sex and type of management system are the most relevant risk factors for the development of these parasites.

References

1. Livestock census (2012) 19th All India Livestock Census. Dep of Anim Husban & Dair Min of Agric Govt of India.
2. Guimaraes AS, Gouveia AMG, Carmo FB, Goiveia GX, Silva MX, Vieira LS, Molento MB (2011) Management practices to control gastrointestinal parasites in dairy and beef goats in Minas Gerais, Brazil. Vet Parasitol 176 : 265—269.
3. Zajac AM, Conboy GA (2012) Veterinary clinical parasitol ogy 8th edn. John Wiley & Sons Inc, UK, pp 3—170.
4. Snedecor GW, Cochran WG (1994) Statistical methods. 8th edn. Oxford and IBH Publ Co, New Delhi.
5. Gupta MK, Rao MLV, Dixit Pooja, Shukla PC, Dixit AK (2016) Prevalence of gastrointestinal nematodes in goats in and around Jabalpur. Environ Ecol 34 : 2495—2497.
6. Dixit Pooja, Rao MLV, Dixit AK, Shukla PC (2016) Prevalence of gastrointestinal parasites in goat kids in Jabalpur. Rumin Sci (Accepted).
7. Zeryehun T (2012) Helminthosis of sheep and goats in and around Haramaya, Southeastern Ethiopia. J Vet Med Anim Hlth 4 : 48—55.
8. Kumsa B, Tadesse T, Sori T, Dugum R, Hussen B (2011) Helm inths of Sheep and goats in Central Oromia (Ethiopia) during the dry season. J Anim Vet Adv 10 : 1845—1849.
9. Chedge R, Dixit AK, Dixit Pooja (2013) Prevalence of gastrointestinal parasites in goats at Adhartal, Jabalpur. Rumin Sci 2 : 155—156.
10. Shahnawaz M, Shahardar RA, Wani Za (2011) Seasonal preva lence of platyhelminthosis in sheep in Ganderbal area of Kashmir valley. J Vet Parasitol 25 : 59—62.
11. Radostits Om, Gay CC, Hinchcliff KW, Constable PD (2010) Veterinary Medicine : A textbook of the diseases of cattle, sheep, goats, pigs and horses. 10th edn. elsevier Publ, Oxford, pp 1541—1583.
12. Dixit AK, Das G, Dixit P, Kumbhakar NK (2016) Detection of benzimidazole resistance in *Haemonchous contortus* of goat at Jabalpur using conventional assays. In : 25th Nat Congress of Veterinary Parasitology and National Symposium on One Health Approach-Plausible Solution For Sustainable Parasite control. Chennai 17-19 Feb, 2016. Ind Assoc Advanc of Vet Parasitol, pp 115.