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MM Shah

Jr. Parasitologist Disease
Investigation Laboratory,
Department of Sheep Husbandry
Nowshera, Srinagar Jammu &
Kashmir, India

I Maqbool

Ph. D Scholar Division of
Veterinary Parasitology F.V. Sc
& AH, SKUAST-K, Shuhama
Alusteng, Srinagar, Jammu &
Kashmir, India

A Manzoor

Ph. D Scholar Division of LPM
F.V. Sc & AH, SKUAST-K,
Shuhama Alusteng, Srinagar,
Jammu & Kashmir, India

N Shabnum

Veterinary Officer Department
of Sheep Husbandry, Srinagar,
Jammu & Kashmir, India

T Rather

Veterinary Officer Department
of Sheep Husbandry, Srinagar,
Jammu & Kashmir, India

SA Ahanger

Sheep Development Officer
Department of Sheep
Husbandry, Srinagar, Jammu &
Kashmir India

Correspondence**MM Shah**

Jr. Parasitologist Disease
Investigation Laboratory,
Department of Sheep Husbandry
Nowshera, Srinagar Jammu &
Kashmir India

Seasonal prevalence of gastrointestinal parasites in sheep of Kashmir valley

MM Shah, I Maqbool, A Manzoor, N Shabnum, T Rather and SA Ahanger

Abstract

The survey was conducted to find out the prevalence of gastrointestinal (GI) parasites in different seasons in sheep of Kashmir valley. A total of 5361 faecal samples subjected to standard floatation technique revealed an overall prevalence of 46.70% for different gastrointestinal parasites. Highest prevalence was observed for strongyles (34.94%) followed by *Eimeria* spp. (7.59%), *Moniezia* spp. (3.49%) and *Strongyloides* spp (0.69%). Among strongyle parasites recovered, the prevalence of *Nematodirus* spp. was reported to be 1.00%. Overall seasonal variation revealed highest prevalence of GI parasites in summer (55.39%) followed by autumn (52.52%), winter (44.66%) and spring (36.44%), the difference being stastically significant ($P < 0.05$) between spring and winter, spring and summer and spring and autumn. *Moniezia* spp. was found significantly ($P < 0.05$) highest in winter with a prevalence of 5.50 percent. Significantly ($P < 0.05$) highest prevalence of strongyle worms was found in autumn (47.16%) followed by summer (33.8%), winter (32.70%) and spring (27.33%) season. *Nematodirus* and *Strongyloides* spp. were found significantly ($P < 0.05$) highest in summer (1.90%) and autumn (1.04%) seasons, respectively. *Eimeria* spp. revealed highest prevalence in summer (19.7%) followed by winter (6.00%) spring (3.94%) and autumn season (2.40%), the difference being stastically significant ($P < 0.05$) between spring and summer, autumn and winter, spring and winter and summer and winter.

Keywords: Gastrointestinal parasites, Kashmir valley, sheep, Seasonal prevalence

1. Introduction

Gastrointestinal parasitism due to nematodes is one of the major constraint for livestock production as heavy losses are inflicted in the form of decreased production, impaired gastrointestinal functions, morbidity, mortality, less feed conversion ratio (FCR), dull hair coat and changes in water balance (Nwosu *et al.* 2007; Lashari *et al.* 2011) [6, 10]. The infection caused by gastrointestinal nematodes (GIN) in ruminants has a worldwide distribution but higher prevalence's are present in temperate areas where climatic conditions favour the development of free-living stages of parasites (Martínez *et al.* 2013) [9]. Coccidiosis also represents one of the most important disease threatening animal industry and is clinically associated with dysentery, reduced growth, dehydration, fever, inappetence, weight loss, anaemia, death in young animals and even wool breaking specially in sheep (Galip, 2004 and Yakhchali and Golami, 2008) [4, 22]. *Moniezia* spp. are associated with diarrhoea, unthriftiness, depressed wool and meat production (Soulsby 1982) [15]. In spite of such health problems and economic losses, the problem of GI parasites is neglected due to its insidious and chronic nature. In order to develop suitable control measures for parasitic diseases there is a need to map out the parasitic fauna from every geographic zone of the world as local climatic conditions and seasonal variations mainly affect the prevalence of parasites. Therefore, the present study was undertaken to work out the prevalence of GI parasites focusing specially on moneiziosis, GI nematodiosis and coccidiosis in sheep of Kashmir valley in different seasons to evolve a package of practices for control of these parasites.

2 Materials and Methods

2.1 Study area: The study was conducted on locally reared sheep from different districts (Central/North/South) of Kashmir valley. Kashmir valley is situated between the Pir Panjal range and the Zanskar range and has an area of 15220 sq kms. The latitude and longitude of Kashmir Valley is 33.27 and 76.2519, respectively. The valley is bounded on all sides by mountains and average height of the valley is 1850 metres above sea level.

The climate of the valley is temperate cum mediterranean type and in the higher reaches, the temperature remains cold throughout the year.

2.2 Parasitological examination: Studies on the prevalence of GI parasites in sheep of Kashmir valley was carried out by randomly collecting 5361 samples from locally reared sheep. The samples were collected directly from the rectum and brought to the Disease investigating laboratory Nowshera, Srinagar in mini polythene bags for examination. The samples were collected in all the four seasons *viz*; spring (March-May), summer (June-August), autumn (September-November) and winter (December-February). Samples were subjected to standard Floatation technique as described by Soulsby (1982) [15] to work out the prevalence of different genera of gastro-intestinal parasites.

2.3 Statistical Analysis: The results were subjected to standard statistical analysis as per Snedecor and Cochran (1994) [16]. Chi square test was employed to determine whether differences between various parameters within and between groups were statistically significant or non-significant.

3. Results and Discussion

The present study revealed an overall prevalence of GI parasites (cestode, nematodes & coccidia) to the tune of 46.70%. The parasites observed were *Moniezia* spp. (3.49%), strongyles (34.94%), and *Nematodirus* spp. (1.00%) *Strongyloides* spp (0.69%) and *Eimeria* spp (7.9%). This is in line with Bhat *et al.* (2012) [2] who reported prevalence of *Moniezia* spp. as 3.0% in sheep of Kashmir valley. However results differed from those of Makhdooni *et al.* (1995) [7] Pandit *et al.* (2003) [11], Shahnawaz *et al.* (2011) [14] and Tramboos *et al.* (2015) [16] who reported prevalence of *Moniezia* spp. as 1.89, 9.03, 11.83 and 7.92% respectively in sheep from different areas of Kashmir valley. Prevalence of strongyles reported in the present study is lower than reported by Tramboos *et al.* (2015) [16] and Allaie *et al.* (2018) [1] who reported prevalence of strongyle worms as 57.75 and 72.85% in sheep of Budgam district and among small ruminants of Kashmir Valley, respectively. However Bhat *et al.* (2012) [2] reported lower prevalence of strongyle worms (24.61%) amongst sheep of Kashmir valley. The highest prevalence of strongyle worms in the present study may be due to the reason that these worms are prolific egg layers and take lesser time for completion of life cycle and thus grazing areas become

heavily infested with the larvae of strongyle worms within a period of fortnight. Prevalence of *Strongyloides* spp. is in close approximation with with Yadav *et al.* (2006) [21] in Jammu region (1.15%). The observed prevalence of *Eimeria* spp is in accordance to Bhat *et al.* (2012) [2] who reported prevalence of *Eimeria* spp. as 9.8% in sheep of Kashmir valley. However results differed from those of Rehman *et al.* (2011) [12], Reshi & Tak (2014) [13] and Maqbool *et al.* (2016) [8] who observed prevalence of *Eimeria* spp. as 55.99, 54.68, 28.33% in goats of Pakistan, sheep of Kashmir valley and Pashmina goats of Ladakh region, respectively.

Overall seasonal variation revealed highest prevalence of GI parasites in summer (55.39%) followed by autumn (52.52%), winter (44.66%) and spring (36.44%), the difference being stastically significant ($P<0.05$) between spring and winter, spring and summer and spring and autumn. *Moniezia* spp. was found significantly ($P<0.05$) highest in winter with a prevalence of 5.50 percent. This in accordance with Bihagi *et al.* (2017) [3] who reported prevalence of *Moniezia* spp. highest in winter season among goats of Kashmir valley. Significantly ($P<0.05$) highest prevalence of strongyle worms was found in autumn (47.16%) followed by summer (33.8%), winter (32.70%) and spring (27.33%) season. The results of the present study differed from those of Tramboos *et al.* (2015) [16] and Bihagi *et al.* (2017) [3] who observed highest prevalence of strongyle worms in summer season in sheep and among goats of Budgam district & Kashmir valley, respectively. Also wani *et al.* (2011) [20] reported highest prevalence of GIN in summer season amongst sheep of Ganderbal district of Kashmir valley. The rainy season starting in spring and continuing to early summer make environmental conditions more favourable for the development and survival of pre-parasitic stages of strongyle worms and leads to an increased availability of infective larvae in the rainy and post rainy seasons. *Nematodirus* and *Strongyloides* spp. were found significantly ($P<0.05$) highest in summer (1.90%) and autumn (1.04%) seasons, respectively. *Eimeria* spp. revealed highest prevalence in summer (19.7%) followed by winter (6.00%) spring (3.94%) and autumn season (2.40%), the difference being stastically significant ($P<0.05$) between spring and summer, autumn and winter, spring and winter and summer and winter. This is in accordance to Walaa *et al.* (2018) [19] who reported highest prevalence of *Eimeria* spp. in summer amongst sheep of Egypt. However results differed from those of Sivajoti & Reddy (2018) [15] who reported lowest prevalence of *Eimeria* spp. in summer season in sheep of Andhra Pradesh.

Table 1: Seasonal prevalence of gastrointestinal parasites in sheep of Kashmir valley

Season	No. Examined	No. Positive	M	S	N	St.	E
Spring	1372	500 (36.44 ^a)	62 (4.52 ^a)	375 (27.33 ^a)	9 (0.66 ^a)	9 (0.66 ^a)	54 (3.94 ^a)
Summer	1159	642 (55.39 ^b)	14 (1.21 ^b)	392 (33.82 ^a)	22 (1.90 ^b)	8 (0.69 ^a)	228 (19.67 ^b)
Autumn	1249	656 (52.52 ^b)	24 (1.92 ^b)	589 (47.16 ^b)	7 (0.56 ^a)	13 (1.04 ^b)	30 (2.40 ^a)
Winter	1581	706 (44.66 ^b)	87 (5.50 ^a)	517 (32.70 ^a)	16 (1.01 ^b)	7 (0.44 ^a)	95 (6.00 ^c)
Total	5361	2504 (46.70)	187 (3.49)	1873 (34.94)	54 (1.00)	37 (0.69)	407 (7.59)

Figures within parenthesis indicate percentage. Values with different superscript in a column under a subgroup vary significantly ($P<0.05$). M= *Moniezia* spp, S= Strongyles, N= *Nematodirus* spp. St.= *Strongyloides* spp. E= *Eimeria* spp.

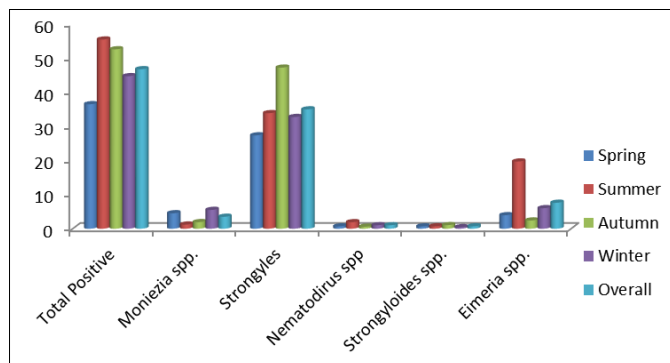


Fig 1: Seasonal prevalence of gastrointestinal parasites in sheep of Kashmir valley

4. Conclusion

The present study revealed prevalence of GI parasites (*Moniezia* spp., Strongyle worms, *Strongyloides* spp. and *Eimeria* spp.) in accordance to different seasons of the year. Hence it is concluded that appropriate managerial practices be adopted including use of those anthelmintics/anticoxidals which are effective against GI nematodes/coccidia therapeutically as well as prophylactically to prevent production losses.

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