Original Research

Prevalence of Gastrointestinal Nematodes in Sheep and Goats Reared by Nomads of Jammu Region of Jammu and Kashmir

Moien Javaid[1]*, Mohd. Rashid[1], Burhan Nabi[2], Mir Mudasir[3], Manzoor Ahmad Bhat[4], Nasir Manzoor Wani[5] and Makhmoor Ahmad Bhat[5]

F.V.Sc. & A. H., R. S. Pura, Jammu, SKUAST-J, INDIA

[1]Division of Veterinary Public Health and Epidemiology
[2]Division of Veterinary Medicine
[3]Division of Veterinary Pathology
[4]Division of Veterinary Surgery and Radiology
[5]Division of Veterinary Pharmacology and Toxicology

***Corresponding author:** moinjavaid@gmail.com

Rec. Date:	Nov 18, 2017 17:01
Accept Date:	Mar 16, 2018 17:30
DOI	10.5455/ijlr.20171118050100

Abstract

The study was carried out to determine the prevalence of gastrointestinal nematodes in sheep and goats domesticated by nomads of Jammu region of J&K. A total of 283 faecal samples were collected and processed by centrifugal fecal flotation technique using 33% $ZnSO_4$ flotation solution to ensure that the flotation is effective. 194 samples were found positive for different gastrointestinal nematodes. The study showed the prevalence rate of gastrointestinal nematodes in sheep and goats to be 65.04 % and 70.55% respectively. Haemonchus was found to be predominant in faecal samples of both sheep and goats. The young ones and females of both species showed the higher parasitic burden compared to adults and males respectively. Based on the findings of present study it is clear that sheep and goats of Jammu region reared by nomads are heavily infected with a variety of nematode parasites.

Key words: Goats, *Haemonchus*, Nematodes, Nomadss, Prevalence, Sheep

How to cite: Javaid, M., Rashid, M., Nabi, B., Mudasir, M., Bhat, M., Wani, N., & Bhat, M. (2018). Prevalence of Gastrointestinal Nematodes in Sheep and Goats Reared by Nomads of Jammu Region of Jammu and Kashmir. International Journal of Livestock Research, 8(8), 219-225. doi: 10.5455/ijlr.20171118050100

Introduction

The goats and sheep form the backbone of livestock sector in Jammu and Kashmir in general and in specific they constitute the major source of income for nomadic tribes of Jammu and Kashmir. So, in order to achieve the economic upliftment of this section of our society it is imperative to provide impetus to this section of livestock. It is an established fact that helminth infestation of sheep and goats decrease their

CC BY NC SA

production to a large extent. One of the major causes of sharp decline in productivity of dairy animals in Himalayan region is gut parasitism Jithendran and Bhat (1999). The parasitic diseases cause high morbidity and huge economic losses that range from 20 to 25 % in terms of low meat, milk and wool production, stunted growth, mortality and morbidity (Gupta, 2006). The prevalence of various gut parasites depends upon diverse agro-climatic, animal husbandry practices and pasture management (Arambulo and Moran, 1981; Joshi, 1998). There are many reports of prevalence of helminths in small ruminants from India Katoch *et al.* (1998); Godara and Sharma (2010) and different parts of Jammu and Kashmir Makhdoomi *et al.* (1995); Khajuria and Kapoor (2003); Yadav *et al.* (2006). The pattern of epidemiology and prevalence of different helminthic diseases in different climatic zones of India provide the basis for developing tactical and strategic control of these diseases Jithendran and Bhat (1999). Since the information regarding the helminth load of sheep and goats reared by nomadic tribes in Jammu and Kashmir is scanty, so this study was carried out to provide information regarding the prevalence of major nematodes in sheep and goats reared by nomadic tribes of Jammu region. Moreover, the information generated may prove of high value to administration and policy makers of the state to make strategies for improving the health status of sheep and goats of nomads, so that they can utilize their resources optimally.

Materials and Methods

Sample Collection and Laboratory Procedure

The study was carried out in the winter season (November, 2015 to January, 2016). The fecal samples were collected randomly from sheep and goats of both sexes and of different age groups. The samples were put in the properly labeled sterilized sample containers and carried to the laboratory. All the samples were processed within 24 hours of the collection. The samples were subjected to qualitative examination by Centrifugal fecal flotation technique using 33% $ZnSO_4$ flotation solution to ensure that the flotation is effective.

Zinc Sulphate Centrifugal Flotation

Fresh faecal specimens were formalinised by adding few drops of 10% formalin to 1g of fecal sample and were then emulsified in 10 parts of saline, finally strained through three folds of gauze. The filtrate was collected in a centrifuge tube and then centrifuged at 1500rpm for 5 minutes. The supernatant was discarded and the sediment was resuspended in water. To the sediment,3-4 ml of 33% zinc sulphate solution was added, then mixed well and filled with ZnSO4 solution to about half an inch of the rim. Several loopfuls of the supernatant fluid were removed with a bacteriological loop and put on slide, then covered with a cover slip and examined under 40X lens Melvin and Brooke (1985).

CC BY NC SA

Hosted@www.ijlr.org DOI 10.5455/ijlr.20171118050100

Results and Discussion

A total of 283 faecal samples were screened, out of which 194 samples were found positive for different gastrointestinal nematodes. Thus, the overall prevalence rate of gastrointestinal nematode infection was found to be 68.55%. A total of 103 samples were collected from sheep and 180 samples from goats. The present study showed the prevalence rate of gastrointestinal nematodes in sheep and goats to be 65.04 % (67 out of 103) and 70.55% (127 out of 180), respectively which is in agreement with the previous studies which reported the prevalence rate of 61.76% of nematode infection in sheep during winter season (Kuchay *et al*., 2011) and 72.5% in goats of Jammu region (Mir *et al.*, 2013a). Among these two species, present study showed lower infection rate in sheep. This may attributed to the fact that sheep develop immunity against nematodes around the age of 12 months while as goats remain more susceptible to nematode infection (Vlasoff *et al*., 2001; Macaldowie *et al*., 2003). The survey reported the presence of eight gastrointestinal nematodes in goats (Table 1) and six in sheep (Table 2).

Table 1: Prevalence rate of different gastrointestinal nematodes in goats (Total positive samples in goats, n=127)

Nematode	No. of Positive Samples	Prevalence (%)
Haemonchus	106	83.46
Ostertagia	90	70.86
Chabertia	71	55.9
Bunostomum	69	54.33
Trichostrongylus	60	47.24
Nematodirus	49	38.58
Oesophagostomum	48	37.79
Trichuris	40	31.49

Table 2: Prevalence rate of different gastrointestinal nematodes in sheep (Total positive samples in sheep, n=67)

Nematode	No. of Positive Samples	Prevalence (%)
Haemonchus	43	64.17
Chabertia	24	35.82
Trichuris	23	34.32
Trichostrongylus	15	22.38
Bunostomum	8	11.94
Oesophagostomum	7	10.44

High prevalence rates of *Haemonchus* (83.46%), *Ostertagia* (70.86%) and *Chabertia* (55.90%) were found in samples collected from goats. Predominance of *Haemonchus*, *Ostertagia* and *Chabertia* was also reported in previous studies (Mir *et al*., 2013a). In sheep *Haemonchus* (64.17%) also showed higher prevalence which is in alignment with the previous studies (Laha *et al.,* 2001; Perry *et al.,* 2002; Pandit *et al.*, 2003; Bhat *et al*., 2007; Lone *et al.,* 2012; Mir *et al.,* 2013b).

Hosted@www.ijlr.org

DOI 10.5455/ijlr.20171118050100

From 117 samples taken from female goats, 84 (71.79%) were positive for one or more gastrointestinal nematodes and from 63 samples taken from males, 43 (68.25%) were found to be positive for one or more gastrointestinal nematodes (Table 3).

Table 3: Gender wise prevalence rate of different gastrointestinal nematodes in goats

Nematode	Male (Total Positive Samples, n= 43)		Female (Total Positive Samples, n= 84)	
	No. of Positive Samples	Prevalence (%)	No. of Positive Samples	Prevalence (%)
Haemonchus	37	86.04	72	85.71
Ostertagia	30	69.76	58	69.04
Chabertia	26	60.46	50	59.52
Bunostomum	22	51.16	46	54.76
Trichostrongylus	21	48.83	41	48.8
Nematodirus	15	34.88	31	36.98
Oesophagostomum	17	39.53	33	39.28
Trichuris	16	37.2	31	36.98

While as out of 56 samples taken from female sheep, 38 (67.85%) were positive and out of 47 samples taken from males, 29 (61.70%) were found to be positive (Table 4). So, in both sheep and goats females carry higher parasitic burden as compared to their male counterparts and this has also been documented by researchers (Wani *et al.*, 2011; Shahnawaz *et al.*, 2011). The hypobiotic larvae in sheep and goats during winter get released and develop faster in the animals with impaired immunity and further add to higher level of infection in females (Khajuria *et al.*, 2013).

Table 4: Gender wise prevalence rate of different gastrointestinal nematodes in sheep

Nematode	Male (Total Positive Samples, n= 29)		Female(Total Positive Samples, n= 38)	
	No. of Positive Samples	Prevalence (%)	No. of Positive Samples	Prevalence (%)
Haemonchus	21	72.41	26	68.42
Chabertia	9	31.02	13	34.21
Trichuris	8	27.58	14	36.84
Trichostrongylus	6	20.68	9	23.68
Bunostomum	5	17.24	5	13.15
Oesophagostomum	5	17.24	4	10.52

Age wise prevalence of gastrointestinal nematodes was found to be highest in 0-2 year age group in both sheep (Table 5) and goats (Table 6) which may be because lambs and kids have low innate ability to resist infection. This inturn results in slow build up of worm numbers in their gastrointestinal tract. However, in older animals only low grade infection was found. It may be due to the fact that mature animals have well

CC BY NC SA
DOI 10.5455/ijlr.20171118050100

developed immunity and ability to fight infection although maintenance of immunity requires regular exposure to parasites.

Table 5: Prevalence of gastrointestinal nematodes in different age groups of sheep

Age Group(Years)	No of Samples Examined	No. of Positive Samples	Prevalence (%)
0-2	38	32	84.21
4-Feb	30	20	66.66
6-Apr	22	12	54.54
8-Jun	8	2	25
8 and above	5	1	20

Table 6: Prevalence of gastrointestinal nematodes in different age groups of goats

Age Group(Years)	No. of Samples Examined	No. of Positive Samples	Prevalence (%)
0-2	70	63	90
4-Feb	44	34	77.27
6-Apr	28	17	60.71
8-Jun	29	11	37.93
8 and above	9	2	22.22

The study showed that both sheep and goats were infected with similar set of gastrointestinal nematodes. The reason could be that Bakerwals have mixed flocks of sheep and goats. Moreover, grazing pattern and managerial practices followed by Bakerwals are almost same for both the species. Even water points, pastures and sheds are shared by these animals.

Conclusion

Based on the findings of present study it is concluded that sheep and goats of Jammu region reared by nomadic tribes are infected with a variety of nematode parasites. So, other animals of this region coming in contact with them face the risk of infection. It must be noted that *Haemonchus* is the predominant gastrointestinal nematode in the region. Since some of the nematodes found in these small ruminants in present study like *Haemonchus* and *Trichostrongylus* are zoonotic in nature, so nomads who live in close association with their flocks are at constant risk of extracting infection. Therefore, it seems to be an urgent task to take further steps towards safe guarding the health of the people associated with sheep and goat in this region. Moreover, there is a need to collect more data of helminth infection in Jammu and Kashmir for a better management of helminth parasites which will lead to better production.

Acknowledgements

The authors are thankful to SKUAST-Jammu for financial and technological assistance.

Conflict of Interest

There is no conflict of interest.

Hosted@www.ijlr.org

DOI 10.5455/ijlr.20171118050100

References

1. Arambulo, P. V. and Moran, N. (1981). The tropics and parasitic disease of animals-their impact on animal and human health. *International Journal of Zoonoses*, *8*: 5-19.
2. Bhat, M. S., Sudhan, N. A., Shahardar, R. A. and Mir, A.Q. (2007). Prevalence of gastrointestinal nematodosis in sheep in Kashmir valley. *Journal of Veterinary Parasitology, 21*(1): 89-91.
3. Godara, R. and Sharma, R. L. (2010). Parasitic infections in livestock at Jaipur. *Journal of Veterinary Parasitology*, *24*: 193–195.
4. Gupta, J. L. (2006). Sheep production and management, 1st edn. CBS Publishers and Distributors, New Delhi, pp 1–239.
5. Jithendran, K. P. and Bhat, T. K. (1999). Epidemiology of parasites in dairy in the Nort-West Humid Himalayan Region of India with particular reference to gastrointestinal nematodes. *Tropical Animal Health and Production, 31*: 205-214.
6. Joshi, B. R. (1998). Gastrointestinal infection of small ruminants and possible control strategies in the hills and mountains of Nepal. *Veterinary Reviews, 13*: 1-5
7. Katoch, R., Mittra, S., Agnihotri, R. K. and Sharma, A.K. (1998). Winter strongyloidosis in sheep and goats at high altitude, a sporadic occurrence. *Indian Veterinary Journal, 75*: 361–362.
8. Khajuria, J. K. and Kapoor, P. R. (2003). Prevalence of parasites in sheep and goats at Kathua-Jammu. *Journal of Veterinary Parasitology, 17*: 121–126.
9. Khajuria, J. K., Katoch. R., Yadav, A., Godara, R., Gupta, S.K. and Singh, A. (2013). Seasonal prevalence of gastrointestinal helminths in sheep and goats of middle agro-climatic zone of Jammu province. *Journal of Parasitic Diseases*, *37*(1):21–25.
10. Kuchay, J. A., Chishti, M. Z., Zaki, M. M., Ahmad, J., Rasool, M., Dar, S. A. and Tak, H. (2011). Prevalence of nematode parasites in sheep of Ladakh-India. *Journal of Agricultural Extension and Rural Development, 3*(13): 229-231.
11. Laha, R., Ramakrishna, .C, Bhattcharya, D. and Sikdar, A. (2001). Seasonal incidence of *Haemonchus contortus* infection in goats- a post-mortem study. *Indian Journal of Animal Sciences, 71*: 345-346.
12. Lone, B. A., Chishti, M. Z., Ahmad, F. and Tak, H. (2012). A Survey of Gastrointestinal Helminth Parasites of Slaughtered Sheep and Goats in Ganderbal, Kashmir. *Global Veterinaria, 8* (4): 338-341.
13. Macaldowie, C., Jackson, F., Huntley, J., Mackellar, A. and Jackson, E. (2003). A comparison of larval development and mucosal mast cell responses in worm-na goat yearling, kids and lambs undergoing primary and secondary challenge with Teladorsagia circumcincta. *Veterinary Parasitology, 114*: 1-13.
14. Makhdoomi, D. M., Shagufta, N., Bandey, S. D. and Moulvi, B. (1995). Incidence of different ovine gastrointestinal parasites in Kashmir. *The Indian Veterinary Journal, 72*: 898–900.
15. Melvin, D. M. and Brooke, M. M. (1985). Laboratory Procedures for the Diagnosis of Intestinal Parasite.p. 163–189.
16. Mir, M. R., Chishti, M. Z., Rashid, M., Dar, S. A., Katoch, R., Khajuria, J. K., Mehraj, M., Dar, M. A. and Rasool, R. (2013a). Incidence of gastrointestinal nematodosis in sheep of Jammu. *Trends in Parasitology Research, 2*(1): 1-4.
17. Mir, M. R., Chishti, M. Z., Rashid, M., Dar, S. A., Kuchay, J. and Dar, J. A. (2013b). Prevalence of gastrointestinal nematodes in goats of Jammu region. *International Journal of Recent Scientific Research, 4*(3):208-210.
18. Pandit, B. A., Shahardar, R. A., Darzi, M. M., Banday, M. A. A. and Bhat, A. S. (2003). Survey of gastrointestinal nematodes in sheep of Kashmir valley. *Indian Journal of Small Ruminants*, *9*: 39-42.
19. Perry, B. D., Randolph, R. F. M. C., Dermott, J. J., Sones, K. R. and Thornton, P. K. (2002). Investing in animal health research to alleviate poverty. Research proceedings. International Livestock Research Institute (ILRI), Nairobi, p 148.
20. Shahnawaz, M., Shahardar, R. A. and Wani, Z. A. (2011). Seasonal prevalence of platyhelminthosis of sheep in Ganderbal area of Kashmir valley. *Journal of Veterinary Parasitology, 25*:59–62.
21. Vlasoff, A., Leathwick, D. M. and Heath, A. C. G. (2001). The epidemiology of nematode infections of sheep. *The New Zealand Veterinary Journal, 49*: 213-221.

CC BY NC SA

 DOI 10.5455/ijlr.20171118050100

22. Wani, Z. A., Shahardar, R. A. and Shahnawaz, M. (2011). Prevalence of nemathelminth parasites in sheep of Ganderbal district of Kashmir valley. *Journal of Veterinary Parasitology*, *25*:26–29.
23. Yadav, A., Khajuria, J. K. and Raina, A. K. (2006). Seasonal prevalence of gastrointestinal parasites in sheep and goats of Jammu. *The Indian Veterinary Journal*, *20*: 65–68.

CC BY NC SA

DOI 10.5455/ijlr.20171118050100