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# Seasonal Prevalence of Gastrointestinal Helminthic Parasitism in Sheep: A Regional Basis Study from Medak District of Telangana State

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**ABSTRACT**

Gastrointestinal tract (GIT) parasitism is a major constraint to livestock sector as it causes huge economic losses. The present study was aimed to study the prevalence of Gastrointestinal (GI) helminthic parasites in sheep. A total of 1200 sheep were examined for the presence of intestinal parasites during the period of 2011 to 2015. The overall prevalence of GI helminths was found to be higher in rainy season. *H. contortus* species of Nematodes and *F. hepatica* species of Trematodes abundant was found to be higher and showed statistically significant mean differences (28.8±9.73, p=0.04; 30.67±10.25, p= 0.03). The mean EPG was higher in rainy season (368.33±137.23, p= 0.01) compared to summer (296.22±65.20) and winter season (274.61±46.82). Our results suggest that overall prevalence of *H. contortus* species of Nematodes and *F. hepatica*species was found to be predominant in rainy season.

## INTRODUCTION

Rearing of domesticated small ruminants like sheep and goat provides livelihood to millions of people, especially to the poor/downtrodden population and got a socio-economic importance in the developing as well as underdeveloped countries. These ruminants are reared for the milk, meat and wool production. Raising or rearing of sheep contributes enormously for economy development to marginal farmers thereby providing local employment. However, Gastrointestinal (GI) helminthic infections are become a major constraints for Indian livestock sector, especially in small ruminants such as sheep and goat by causing drastic growth retardation, low fertility, milk production, decreased feed conversion ratio and high mortality rates in cases of massive infections [1].

The prevalence of gastrointestinal helminths associates with agroclimatic conditions such as quantity and quality of available pasture, climatic temperature, humidity, and grazing behavior of animal [2]. Though few helminthic parasites distribute throughout the world, they show significant difference with respect to production, management and geoclimatic conditions [3]. The climatic temperature of a specific locality or zone is one of the important factor that influence the type and severity of GI parasitic infections in small ruminants. Comprehensive knowledge on epidemiological pattern of helminthic infections may contributes to develop rational and sustainable strategies for eradication of GI helminthic infections. However, parasitic control strategies may differ from one climatic zone to other zones as they show difference in ecological factors that influence management practices.

Previously several studies have been demonstrated the prevalence of gastrointestinal helminths in small ruminants from different agroclimatic zones of India. Sing et al [4] reported that the overall prevalence GIT parasitic infections in small ruminants was 85.16% in sheep and 79.24% in goats in western zone of Punjab (North India). It was reported that prevalence of gastrointestinal (GI) parasites in Tamil Nadu (South India) was found to be higher in sheep (66.33%) than in goats (57.67%). However, studies on the prevalence and risk factors associated to gastrointestinal helminthiasis from South India especially from Telangana State are still incipient.

Further studies on regional basis to evaluate Gastro Intestinal (GI) helminths burden may contribute to develop effective control strategies and to prevent economic losses. Hence, the

present study was carried out to study the prevalence of GI helminths and their associated risk factors in Medak district of Telangana State.

## MATERIALS AND METHODS

A total of 1200 sheep were examined for the presence of intestinal parasites during the period of 2011 to 2015. Faecal sample from each sheep was collected at rearing farmhouses or slaughterhouse with the prior consent of the owners. Each Sample was labeled and transported to laboratory in an ice chilled container in order to slow down nematode egg development process during transportation. Out of 1200 sheep, 662 sheep were positive for helminthic parasite infection. All faecal samples were examined for helminth eggs by Direct, Sedimentation, Floatation techniques [5,6]. The ova of gastrointestinal parasites were identified based on their morphological features [7]. Egg Per Gram (EPG) was estimated according to McMaster technique [8].

### Statistical analysis

Statistical analysis was carried out using SPSS software (Version 20.0). ANOVA test was performed to analyses the association between prevalence of GI helminth infections and various factors.

## RESULTS

The overall prevalence of GI helminths was found to be higher in rainy season compared to summer and winter season. The abundance of helminths parasites was more during the period of 2011 to 2013 Further, when we observed the species wise prevalence of GI parasites, *H. contortus* species of Nematodes and *F.hepatica* species of Trematodes occurrence was found to be higher and showed statistically significant mean differences (28.8±9.73, p=0.04; 30.67±10.25, p= 0.003) compared to other species of Nematodes, Trematodes and Cestodes.

Furthermore, data was stratified to analyse the seasonal and species wise prevalence of GI parasite helminths in sheep during four years of the study. The prevalence of *H. contortus* species (Nematodes) and *F. hepatica* species (Trematodes) was significantly increased in rainy season (14.05±4.83, p=0.05; 14.84±4.27, p=0.02) compared to summer and winter season. The mean EPG was significantly elevated in rainy season (368.33±137.23, p= 0.01) compared to summer (296.22±65.20) and winter season (274.61±46.82).

**Table 1: Overall seasonal prevalence of GI Helminths in sheep**

| | No of samples | No of positives | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 |
|---|---|---|---|---|---|---|
| **Summer** | 400 | 139(34.75) | 44(31.60) | 42(30.2) | 21(15.2) | 32(23.0) |
| **Rainy** | 400 | 285(71.25) | 85(29.9) | 86(30.2) | 47(16.4) | 67(23.5) |
| **Winter** | 400 | 238(59.50) | 69(30.0) | 77(32.0) | 30(12.0) | 62(26.0) |

**Table 2: Species wise prevalence of GI Helminths in sheep**

| Name of the Helminths and their species | (Mean ± SD) | p-value |
|---|---|---|
| **Nematodes** | | |
| *H.contortus* | **28.8±9.73** | **0.04** |
| *Trichuris ovis* | 24.92±7.86 | |
| *Ascaris* | 23.67±10.09 | |
| | | |
| **Trematodes** | | |
| *Paramphistomum cervi* | 26.80±5.02 | |
| *F.hepatica* | **30.67±10.25** | **0.03** |
| *Fasciola gigantica* | 23.92±9.86 | |
| | | |
| **Cestodes** | | |
| *Monezia expansa* | 26.75±5.05 | 0.21 |
| *Monezia bendini* | 28.79±6.41 | |

*p-value of less than 0.05 was considered statistically significant results*

**Table 3: Seasonal wise and species wise prevalence of GI Helminths in sheep**

| GI Helminths Name | Summer season | p-value | Rainy season | p-value | Winter | p-value |
|---|---|---|---|---|---|---|
| **Nematodes** | **(Mean±SD)** | | **(Mean±SD)** | | **(Mean±SD)** | |
| *H.contortus* | 8.89±3.92 | | **14.05±4.83** | **0.05** | 8.21±2.82 | 0.96 |
| *Trichuris ovis* | 9.21±5.09 | 0.91 | 11.05±4.52 | | 7.94±3.17 | |
| *Ascaris* | 8.90±3.85 | | 10.68±4.29 | | 8.05±2.87 | |
| | | | | | | |
| **Trematodes** | | | | | | |
| *Paramphistomum cervi* | 8.42±3.09 | 0.90 | 11.94±3.30 | | 9.47±4.5 | 0.73 |
| *F. hepatica* | 8.05±3.20 | | **14.84±4.27** | **0.02** | 8.63±3.87 | |
| *Fasciola gigantica* | 8.47±3.38 | | 11.68±3.43 | | 8.57±3.35 | |
| | | | | | | |
| **Cestodes** | | | | | | |
| *Monezia expansa* | 8.74±3.20 | 0.50 | 11.53±2.99 | 0.24 | 10.53±4.38 | 0.32 |
| *Monezia bendini* | 7.83±2.57 | | 12.74±3.36 | | 9.16±4.03 | |

*p value of less than 0.05 was considered statistically significant results*

**Table 4: Sex, age and seasonal observation of EPG count (Eggs Per Gram) in faecal samples of sheep**

| | Male | Female | p-value | Young | Adult | p-value |
|---|---|---|---|---|---|---|
| **Egg count** (Mean±SD) | 251.82±66.27 | **433.56±216.52** | **0.001** | 301.77±69.48 | **379.44±131.64** | **0.03** |

| | Summer | Rainy | Winter | p-value |
|---|---|---|---|---|
| **Egg count** (Mean±SD) | 296.22±65.20 | **368.33±137.23** | 274.61±46.82 | **0.01** |

*p-value of less than 0.05 was considered statistically significant results.*

## DISCUSSION

Gastrointestinal (GI) parasitism, especially helminthiasis pose major health problem affecting productivity of small ruminants worldwide. The transmission of helminthic infection may

depend on favorable environmental conditions, geographical or farm management differences which influence the significant variation in helminthic population. In our study, the prevalence of GI helminths was more in rainy season compared to summer and winter season. This might be due to the higher rainfall during rainy season which resulted in dispersion or spread of helminthic parasite larvae on pasture and led to increased transmission rate [9,10]. Moreover, higher rainfall and temperature may lead to physiological stress to the animal that influence the immunity of the animal and make them susceptible to parasitic transmission. [11].

Further, it was observed that *H.contortus* and *F.hepatica* were observed to be predominant compared to other species of GI helminthic parasites. Moreover, these two parasites were more prevalent in rainy season compared to winter and summer season. Previously, it was reported that Haemonchus contortus prevalence was more worldwide [12]. Our results were in accordance with previous studies who reported that prevalence of *H.contortus* and *F.hepatica*was observed to be increased in rainy season [13,14]. We observed that EPG count was significantly abundant in young and female sheep compared to adult and male sheep. Furthermore, EPG was observed to be elevated in rainy season compared to winter and summer season. Rainfall may favors the dispersion of eggs on pasture that increase the chance of transmission of eggs to animal.EPG was found to be highest in young sheep compared to adult [15] and suggested that this might be due to the low level of immunity in young sheep that make the animal susceptible to the infection.

## CONCLUSION

Our study suggest that high prevalence of gastrointestinal helminth parasitism especially, *H.contortus* and *F.hepatica* prevalence was predominant in rainy season hence, two annual anthelminthic treatments during the start and end of monsoon would help to minimize the prevalence GI parasitic infection and improve the optimum growth and productivity of small ruminants.

## Conflict of interest

None

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