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Epidemiological studies on *Haemonchus contortus* in sheep of Telangana state, India

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Abstract

The overall prevalence of *Haemonchus contortus* was 63.4% in Telangana state, India, with infection rates of 70.7% in the southern, 62.0% in the central, and 49.6% in the northern agro-climatic zones. Among the districts higher rate of prevalence was recorded in Mahabubnagar district 84.0% (126/150) followed by Nalgonda 79.3 % (119/150), Rangareddy 74.0 % (115/150), Khammam 73.3% (110/150), Warangal 67.3% (101/150), Karimnagar 66.6 % (100/150), Hyderabad 66% (99/150), Suryapet 65.3% (98/150), Siddipet 59.3% (89/150), Medak 58.6% (88/150), Medchal-Malkajgiri 53.3%, (80/150), Sangareddy 51.3% (77/150), Jagtial 47.3% (71/150), Kamareddy 45.3% (68/150) and least in Nizamabad district 39.3 % (59/150). Age wise studies recorded highest infection in lambs of 6-12 months (75.5%), followed by less than 6 months age group (63.3%) and lesser in above one year age group (48.7%) when compared to the other two groups. Prevalence of *Haemonchus contortus* infection was higher in rainy season (78.8%), followed by winter season (61.4%) and lower in summer season (47.0%). Ewes were more prone to infection (72.3%) than Rams (27.3%).

Keywords: Prevalence, agro-climatic zones, *Haemonchus contortus*

Introduction

Haemonchus contortus is a parasite responsible for sudden outbreaks of haemonchosis, which leads to high mortality, especially in young animals in subtropical and tropical regions with persistently hot and humid climates (Kalita *et al.*, 1978; Urquhart *et al.*, 1996) ^[4, 7]. Based on the intensity of infection, the pathogenicity of disease is classified into hyperacute, acute and chronic forms (Soulsby, 1982) ^[5]. In hyperacute cases large number of worms attack simultaneously and the animal dies suddenly within a week without any preliminary signs due to severe blood loss, which is about 200-600 ml/day. Acute cases show anaemia, bottle jaw and tarry colored faeces. This anaemia is purely hemorrhagic (Bakker *et al.*, 1959) ^[1] where adult worms feed on blood and the average blood loss per worm per day range from approximately 0.003 to 0.05 ml (Clark *et al.*, 1962, Soulsby, 1982) ^[2, 5] and 0.07 ml of blood/day (Malviya *et al.*, 1979) which results in reduced erythrocyte and lymphocyte counts, decreased hemoglobin and packed cell volume.

Materials and Methods

Study design

A total of 2250 faecal samples were collected from sheep of Telanagna state for a period of one year from July 2023 to June 2024 covering three seasons *viz.* rainy (July - October), winter (November - February) and summer (March - June). Prevalence was studied in relation to zone, age, sex, season during this period. To have a representative number of the animals multistage stratified random sampling method was employed. Simultaneously, from each district definite no. of (n=150) faecal samples collected from fifteen districts of Telangana selected among three agroclimatic zones.

Collection and storage of sample

Faecal samples (about 10 g) were collected aseptically from the rectum of animals avoiding extraneous contamination. Random faecal sampling was done from sheep of either sex, different age groups (Upto 6 month, 6 to 12 month & More than 12 month), in different seasons (Rainy-July to October, Winter-November to February, Summer-March to June).

Coproculture for L3 larvae of *H. contortus* from faecal samples

Faecal samples that were positive for strongyle eggs were processed for coproculture to identify the *H. contortus* larvae present in pooled samples collected from sheep from different regions of Telangana. Charcoal faecal culture was prepared in the laboratory by adding three parts of sterilized powdered faeces (sterilized by hot air oven at 160°C for 2 h) and two parts of activated charcoal powder. The mixture was put on an inverted petridish (4 inch diameter). This smaller petridish was kept in a large petridish (12 inch diameter) containing distilled water. The water in between the two petridishes provided sufficient humidity for the development of larvae. The large petridish was covered by another petridish of same size to prevent entry of dust particles and other contaminants. The mixture containing faeces and charcoal put on the surface of inverted petridish. The faeces of sheep were implanted on the surface of faecal-charcoal mixture. The faecal culture was covered by equal sized petridish of 12 inch diameter. The water from culture was examined regularly under microscope for the development of L3 larvae. FIG 1.

Results and Discussion

Overall prevalence of *Haemonchus contortus* in sheep of Telangana state

In the present research, a total of 2250 fecal samples of sheep were examined out of which 1840 (81.7%) were found positive for strongyle ova. Upon coproculture of these faecal samples revealed copro-prevalence of *Haemonchus contortus* was 62.2%. (1400/2250). The study revealed variations in overall prevalence of *Haemonchus contortus* ova in sheep with regard to agroclimatic zone, age, sex and season which have been detailed in Table 1.

In the present research, the overall copro-prevalence of *Haemonchus contortus* in Telangana was 62.20%. Higher rate

of infection was found in sheep in south zone with a prevalence of 70.7% followed by 62% in central zone and 49.6% in north zone of Telangana. This percent of overall prevalence was more or less in agreement with 63.91% in West bengal (Brahma *et al.*, 2018) [8], 60% in Uttar Pradesh (Rashid *et al.*, 2018) [9]. Variable rate of prevalence of *Haemonchus contortus* in sheep have been reported from different parts of India with 80% in Mathura, 50.90% in Kashmir (Wani *et al.*, 2013) [10], 37% in Himachal Pradesh (Sharma *et al.*, 2015), 45.94% in coastal area of Tamilnadu (Varadharajan and Vijayalakshmi 2015) [6], 61.18% in Jammu (Bugalia *et al.*, 2022) [11]. The variation in rate of prevalence might be due to variation in climatic conditions in different geographical regions and husbandry practices adopted by the respective farmers.

The rate of prevalence of *H. contortus* infection in sheep was significantly ($P \leq 0.05$) highest in rainy season followed by winter and least in summer season. These observations were similarly have been reported by previous researchers showing highest rate of prevalence during rainy season, followed by winter and lowest in summer season (Ghosh *et al.*, 2002; Varadharajan and Vijayalakshmi, 2015; Bansal, *et al.*, 2015; Rahman *et al.*, 2017; Brahma *et al.*, 2018; Jena *et al.*, 2018., and Priyanka *et al.*, 2019; Veena *et al.*, 2021) [3, 6, 12, 8, 13, 14, 15].

The overall prevalence of *Haemonchus contortus* infection was significantly ($P \leq 0.05$) higher in female sheep (72.3%) than in males (27.3%). Correspondingly many of the researchers have observed higher rate of infection in female sheep and goats than in male animals in different regions of India (Khajuria *et al.*, 2013; Tramboos *et al.*, 2015; Nagesh and Vanitha 2016; Singh *et al.*, 2017; Pankaj *et al.*, 2021) [16, 17, 18, 19, 20] including from certain districts of Karnataka.

There was significant difference ($P \leq 0.05$) observed among different age groups with regard to copro-prevalence of *Haemonchus contortus* infection with highest percentage of prevalence in age group of 6-12 months, followed by age group less than 6 months age and least in sheep aged above 12 months. This current observations is in consistency with the findings of Pankaj *et al.*, 2021 [20] who reported in sheep of Orissa. Lower rate of prevalence was recorded in the lambs aged below 6 months age because they are usually kept confined in most of the farms and not allowed to graze along with adults. Hence, they get less exposure to infective larvae.

Table 1: Overall prevalence of *Haemonchus contortus* in sheep

Host	Total number of faecal samples examined	Number of faecal samples infected with <i>Haemonchus contortus</i>	Percentage of infection
Sheep	2250	1400	62.2

Conflict of Interest

Not available

Financial Support

Not available

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