



ISSN (E): 2277-7695

ISSN (P): 2349-8242

TPI 2024; 13(3): 06-08

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www.thepharmajournal.com

Received: 05-12-2023

Accepted: 13-01-2024

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An abattoir survey on intestinal schistosomosis among slaughtered cattle in Thrissur district, Kerala

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Abstract

Intestinal schistosomosis is an economically important disease affecting a large number of animals causing considerable losses in the livestock sector in India. Routine diagnosis based on the clinical symptoms and faecal sample examination for eggs of the parasite usually underestimates the prevalence of the disease. Hence the present research work was undertaken during one year period from August 2017 to September 2018 to assess the accurate prevalence rate of intestinal schistosomosis among cattle. The worms recovered from mesentery of slaughtered cattle brought to Municipal slaughter house, Kuriachira, Thrissur, Kerala were morphologically identified and counted. Out of 152 mesentery samples collected from slaughtered animals, 37 (24.34%) were positive for *Schistosoma spindale* and one was positive for *S. indicum*. The study reveals the significance of the infection in cattle and also the necessity of development of a sensitive, specific and rapid diagnostic test for intestinal schistosomosis, as the field level reports are scanty.

Keywords: Intestinal schistosomosis, Abattoir survey, *Schistosoma spindale*

Introduction

Schistosomosis is an important snail borne blood fluke infection affecting both man and animals in the tropical and subtropical countries. As per published records, approximately 200 million people and 165 million cattle worldwide are affected by the disease. Intestinal schistosomosis is a problem of considerable economic significance causing loss in terms of animal health and productivity and now is ranked to be the fifth major helminthosis of domestic animals in Indian subcontinent (Sumanth *et al.*, 2004) [5]. The routine faecal sample examination for detection of eggs which usually underestimates the incidence of the infection especially in areas where endemicity and infection intensity are low. Hence, present study was undertaken to estimate the actual prevalence of intestinal schistosomosis in cattle in Thrissur, Kerala.

Materials and methods

Large and small intestinal mesentery samples were collected during the evisceration of 152 cattle slaughtered at Thrissur corporation slaughter house, Kuriachira during a period from August 2017 to July 2018. These samples were then brought to the Department of Veterinary Parasitology, CVAS, Mannuthy for further processing. Mesentery samples were cut into small pieces, immersed in normal saline and kept undisturbed at room temperature for about four to five hours. Then the mesentery pieces were discarded, the normal saline was filtered into a vessel and the visible adult schistosomes were recovered. These recovered worms were then subjected to light microscopic examination and were identified morphologically as per Kumar (1999) [6]. Season based prevalence of infection was also studied as suggested by Rao (2003) [7].

Results and Discussion

The recovered worm pairs were morphologically identified based on features of cuticle, testis and ova. The adult flukes with smooth cuticle and five to six testes were identified as male *S. spindale*, whereas the flukes with Napoleon hat shaped ova with terminal spine in the uterus were identified as female *S. spindale* worms (Fig.1). *Schistosoma indicum* worms were recovered from a single mesentery sample and they were easily differentiated by the presence of tuberculated cuticle and eight to sixteen testes in male worms and by the presence of ovoid eggs with terminal spine within the uterus of female worms (Fig.2). Out of the 152 samples collected (Fig.3), 37 harboured *S. spindale* while one was positive for both *S. spindale* and *S.*

indicum.

The overall prevalence of intestinal schistosomosis in the cattle population studied was estimated to be 25%. The highest prevalence of infection (26.32%) was observed during monsoon season (June-September) followed by 31.74%

during post-monsoon (October-January) and the least prevalence (15.68%) was recorded during the pre-monsoon (February-May) seasons. However, there was no statistically significant difference in the prevalence of infection between seasons.

Table 1: Season-wise prevalence of intestinal schistosomosis

Season	Total number examined	Total positive	Percent positive
February-May (Pre-monsoon)	51	8	15.68 [#]
June-September (Monsoon)	63	20	31.74 [#]
October-January (Post-monsoon)	38	10	26.32 [#]
Total	152	38	

The number of worm pairs recovered from each mesentery was the basis for estimating the intensity of infection. Of the positive samples (n=38), only two samples (5.26%) exhibited high intensity infection, while five samples (13.15%) exhibited moderate intensity and 31 samples (81.57%) harboured low intensity infection. There was no statistically significant difference between the occurrence of low, moderate and high intensity infections.

Table 2: Intensity of intestinal schistosomosis among the infected animals

Intensity of infection	Number of animals	Percent positive
High (>100 worm pairs)	2	5.26 [#]
Moderate (20-100 worms)	5	13.15 [#]
Low (1-20 worm pairs)	31	81.57 [#]



Fig 1: Female *Schistosoma spindale*

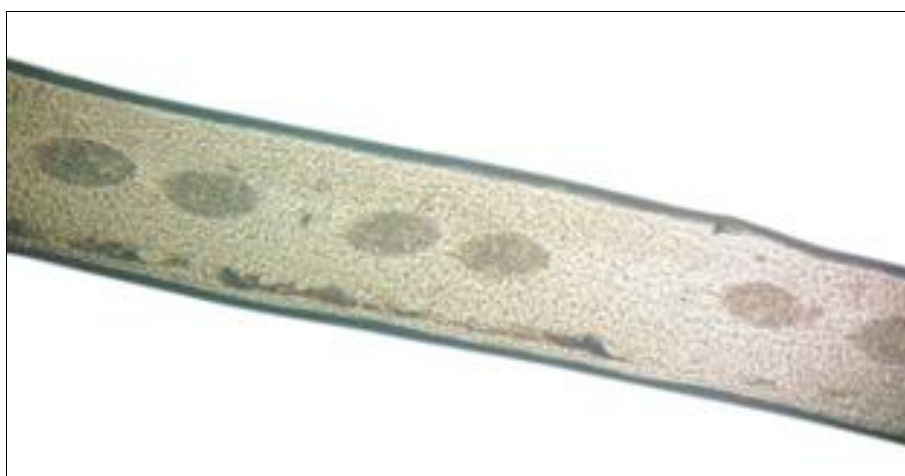


Fig 2: Female *Schistosoma indicum*



Fig 3: *Schistosoma* spp. *in situ*

Mesenteric worm count technique recorded an occurrence rate of 31.2% of *S. spindale* in ruminants of Sri Lanka (De Bont *et al.*, 1991) [8]. It is understood that geographical diversity could affect the occurrence of schistosomosis in animals as it depends on the presence of snail intermediate hosts. Besides, method of collection of worms from the slaughtered animals also creates variation in the rate of occurrence of the infection (Jeyathilakan *et al.*, 2008) [9]. The carrier status of the infected animals and the continuous exposure to intermediate hosts throughout the year could influence the occurrence of infection (Lakshmanan, 2014) [10]. Comparative increase in the occurrence of the infection during monsoon season could be due to the abundance of snails, higher rate of infection of snails by miracidia, increased distribution of faecal matter facilitated by rain and increased contamination of water bodies with cercaria during rainy season. Higher prevalence rate of intestinal schistosomosis in monsoon was also observed by Berdarker *et al.* (2000), Khajuria and Kapoor, (2003), Jeyathilakan *et al.* (2008) [9], Islam *et al.* (2011) [11] and Lakshmanan (2014) [10]. Similarly, a lower prevalence of infection in summer was recorded by Berdarker *et al.* (2000) and they opined that it could be due to the harsh dry condition which was unfavourable for the survival of snail intermediate hosts.

Conclusion

Abattoir survey in slaughtered cattle showed intestinal schistosomosis is considerably present among cattle population in Kerala. Routine faecal sample examination usually underestimates the actual prevalence status of intestinal schistosomosis in cattle. Hence a more sensitive method of prevalence status assessment has to be adopted to avoid unnecessary loss in livestock sector.

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