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Epidemiological Study of Fasciolosis in Cattle of Kashmir Valley

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Abstract: Epidemiological studies were undertaken in slaughter houses, livestock farms and on household cattle under the different climatic conditions in Kashmir valley. Infection rate was 25.40%, 26.21% and 10.19% respectively in slaughtered cattle, cattle in livestock farms and in household cattle. Overall highest (26.70%) seasonal prevalence in all types of cattle was recorded during autumn, followed by summer (20.0%) and spring (10.22%); while the lowest (7.14%) was recorded during winter. It was noticed that a higher infection rate was recorded in older cattle than in youngsters (below 2 years of age) whereas cattle of either sex were equally affected.

Key words: Cattle · Fasciolosis · Epidemiology · Management · Season · Kashmir

INTRODUCTION

Fasciolosis is a wide spread parasitosis responsible for immense economic losses in cattle in terms of condemnation of livers, decreased milk and meat production, loss of weight and poor carcass quality [1, 2]. Helminth parasites play an important role in decreasing the cattle production around the world, not only in hot and humid conditions but also in cold and drier conditions. The climatic factor may favour the development of helminth parasites during nutritional stress and wet season in tropical and semitropical areas of the world. Cattle play a significant role in national economy and rural socioeconomic conditions in the country [3]. The overall development of the rural and hilly areas could not be achieved by neglecting the development of the agricultural commodities like goats, sheep, cattle and poultry. The cool temperate agro climatic conditions, traditional animal husbandry practices and poor veterinary infrastructure; abundance of alpine and sub alpine pastures are natural determining factors of incidence and severity of various parasitic diseases of livestock in these regions [4]. For better and appropriate control strategies, it is important to identify helminth parasites and specific risk factors that are unique to the area and farming system. As the effects of parasites in animals vary between different climatic zones, so the research is essential in each climatic zone. Therefore, the present study was undertaken on the cattle in Kashmir valley of Jammu and Kashmir State.

MATERIALS AND METHODS

The study was carried out in cattle from July 2007 to January 2009 in Kashmir valley, Jammu and Kashmir, India. To record the prevalence of fasciolosis a survey of 8 slaughterhouses in rural areas of Kashmir was carried out by visiting the abattoirs at regular intervals. Postmortem examinations of slaughtered animals were carried out and livers were checked for the presence of the parasites. In the laboratory, collected fresh livers were immersed in normal saline (0.85%), opened and analyzed by standard procedures [5]. The parasites were shaken vigorously in a tube containing 1% NaCl. After the mucous has been removed, the trematodes were put in distilled water for about a minute prior to killing, which served to relax the specimen further. Parasites were fixed in Carnoy's fixative and then preserved in 70% alcohol to which 5% glycerol was added. Trematodes were processed for permanent preparation, mounted in DPX and identified. The faecal samples were collected from the livestock farms and from household cattle under different climatic conditions existing in Ladakh region. Samples for laboratory diagnosis were collected in suitable air tight

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containers such as screw cap bottles, plastic bags and carefully labeled with animal identification, breed, sex, dental age and month of collection. Samples were collected in 4% formalin and subjected to qualitative examination in the laboratory by the procedures described earlier [5]. The data were analyzed using statistical packages MINITAB software version 13.2 (Minitab, 2002).

RESULTS

During the study between July 2007 to January 2009, 122 cattle from slaughterhouses, 164 from livestock farms and 206 household cattle were examined of which 31 (25.40%) from slaughter houses, 43 (26.21%) from livestock farms and 21 (10.19%) household cattle were infected with *Fasciola* (Table 1) results were found statiscally significant (P = 0.001).

Overall highest (26.70%) seasonal prevalence in all types of cattle was recorded during autumn, followed by summer (20.0%), spring (10.22%). While the lowest prevalence (7.14%) was recorded during winter (Table 2). It was also found that prevalence was higher in cattle in livestock farms (26.21%), followed by slaughterhouse cattle (25.40%), while the lowest (10.19%) prevalence was recorded in house hold cattle (Table 2).

It was noticed that a higher infection rate was recorded more frequently in adult cattle (26.52%) than in youngsters (below 2 years of age) (8.92%) as shown in Table 3, whereas sex showed no significant difference (Fig. 1) and the results were found similar in visceral and faecal examinations.

DISCUSSION

It is well understood fact that epidemiology forms the foundation on which the edifice of parasitic diseases control can be constructed. The present study indicates that the infection with fasciolosis is a frequent phenomenon among the ruminants of Kashmir as reported earlier by several workers [6]. The high prevalence of helminthic infections observed in present study was in accordance to earlier reports [7-10], who have reported helminth parasites from different geographical regions of the world. The minor difference in results may be due to different geoclimatic conditions and study areas.

In the present study, epidemiological data on fasciolosis was collected from cattle in slaughterhouses, in livestock farms and in households of Kashmir valley. When the data on seasonal prevalence in all the three groups of cattle were analyzed, it was observed that a

Table 1: Epidemiology of Fasciolaosis in cattle

Examined cattle	No. Examined	Positive	% of infection*
Slaughtered	122	31	25.40
Livestock farm	164	43	26.21
House hold	206	21	10.19
Overall	492	95	19.30

**P-Value* = 0.001

Table 2: Seasonal prevalence of fasciolosis in cattle

	Seasonal prevalence				
	Spring (P=0.30)	Summer (P= 0.08)	Autumn (P=0.03)	Winter (P=0.44)	Overall (P=0.001)
Cattle	Infected/Examined	Infected/Examined	Infected/Examined	Infected/Examined	Infected/Examined
Slaughtered	4/22 18.18%	11/48 22.91%	13/34 38.23%	2/18 11.11%	31/122 25.40%
Livestock farms	3/28 10.71%	16/54 29.62%	22/60 36.66%	2/22 9.09%	43/164 26.21%
House hold	2/38 5.26%	7/68 10.29%	12/82 14.63%	0/16 0%	21/206 10.19%
Overall	9/88 10.22%	34/170 20.0%	47/176 26.70%	4/56 7.14%	95/492 19.30%

Table 3: Age wise distribution of fasciolosis in cattle

Cattle	Below 2 years (P=0.07) Infected/Examined	Above 2 years (P= 0.01) Infected/Examined
Slaughtered	5/45 11.11%	26/77 33.76%
Livestock farms	12/76 15.78%	31/88 35.22%
House hold	4/92 4.34%	17/114 14.91%
Overall	19/213 8.92%	74/279 26.52%

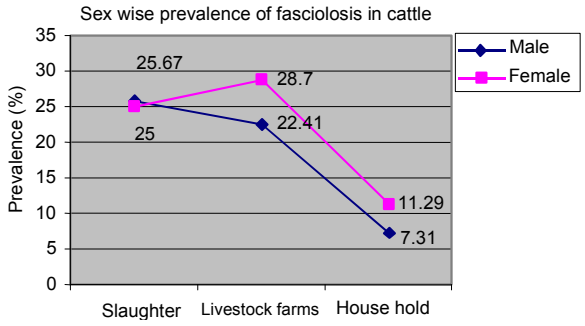

Fig. 1: Sex wise prevalence of fasciolosis in cattle

higher prevalence of fasciolosis occurred during autumn, followed by summer and spring, while it was lowest during winter, these findings are consistent with observations reported earlier [11-15]. In fact, some workers reported that fasciolosis is definitely seasonal and is at most restricted to two seasons of the year; autumn and spring [16,13]. *Fasciola* cercariae and *Lymnaea* snails have been found to survive better at 25-30°C which explains, in part at least, the much higher prevalence in autumn compared to other seasons. Other studies reported that the two most important factors influencing the prevalence of fasciolosis are temperature and moisture, where both affect the hatching of fluke ova, the viability of encysting metacercariae and population of snails. Soulsby [5] emphasized that there are at least two seasonal periods in which temperature and moisture are favourable for the rapid propagation of the parasitic life cycle. In the present study, rains beginning during June change environmental temperature and humidity, thereby favouring the emergence of cercariae from snails. Consequently, metacercariae may show their existence in July after ingestion, which produces fasciolosis in animals. This assumption appears to be the reason for the high prevalence of fasciolosis during autumn. In the present study, animals over two years old were significantly more frequently affected than those under 2 years; it may be assumed that young cattle got more access to pasture land than the calves to have the infection. The recorded findings corroborate the opinion of the previously mentioned results [17-22]. On the other hand, Firreria *et al*. [23]; Shah-Fischer and Kiyyu [24]; Nganga *et al*. [25] from different countries of the world recorded a higher prevalence rate in younger animals than adult ones. The reason behind this observation may be the fact that younger animals are more susceptible to infections than adults. Adult animals may acquire immunity to parasites through frequent challenge and expel the ingested parasite before they establish infection [26-28].

CONCLUSION

The present study reported age and season were most important factors that influence risk of fasciolosis in cattle of Kashmir valley. These factors need to be taken in consideration when designing effective control management system for these animals. Further experimental studies are recommended to define and evaluate the predictable risk factors of helminth infections in cattle managed under traditional husbandry system on natural pastures during late spring, summer and early autumn.

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