

Some Epidemiological Aspects of Fascioliasis among Cattle of Ladakh

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Abstract: A total of 208 cattle were randomly selected among slaughter houses, household and livestock farms to determine the prevalence of fascioliasis. Epidemiological studies on fascioliasis of cattle were undertaken in such localities under different climatic conditions existing in Ladakh region of Jammu and Kashmir State. Infection rate was 51.42%, 27.69% and 21.91% in slaughtered, livestock farm and household cattle, respectively. Significant variations were observed in the prevalence with respect to various host factors and the climate of the study area. Overall, the highest seasonal prevalence (45.19%) in all types of cattle was recorded during wet season while as only (24.40%) was recorded during the dry season. It was noticed that a higher infection rate was recorded in young cattle ages (0- 2 years) (40.02%) than in adult ones (28.04%) (3- 8 years). Moreover, the prevalence of infection in females was more (38.07%) than males (29.09%). It was also observed that the infection rate was high in comparatively low land areas (37.14%) as compared to high altitudes (30.09%). This study will provide necessary information regarding fascioliasis in cattle of Ladakh for their effective control and hence for a better production which will be beneficial resource to poor people where live stock rearing is one of the important sources of livelihood.

Key words: Epidemiology % Fascioliasis % Cattle % Ladakh

INTRODUCTION

Fasciolosis is a worldwide parasitic disease common in ruminants, especially cattle, buffaloes, sheep, goats and swine. It may, however, affect humans [1-5]. Once ingested, parasites migrate through the liver parenchyma to reach the bile ducts. In ruminants, the liver is damaged and the subclinical and chronic disease usually results in decreased production of meat, milk and wool and secondary bacterial infections, fertility problems, loss of weight and poor carcass quality and great expenses with anthelmintics [6]. Fasciolosis is an important *helminth* disease caused by two *trematodes Fasciola hepatica* (the common liver fluke) and *Fasciola gigantica*. This disease belongs to the plant-borne trematode *zoonoses*. In Europe, Americas and Oceania only *F. hepatica* is a concern, but the distributions of both species overlap in many areas of Africa and Asia [7]. The *life cycle* includes *freshwater snails* as an *intermediate* host of the parasite [8].

Surveys in some Asian countries have shown that among domestic animals, cattle are the most suffering animals from fascioliasis [9].

The prevalence is high in areas surrounding dams or large ponds in which *Lymnaea auricularia rubiginosa*, the intermediate host of *F. gigantica* is found. An epidemiological study revealed that the disease has a seasonal pattern from which the following conclusion for control of the disease can be drawn [10]. Strategic liver fluke treatment of all cattle and buffaloes which are older than 8 months should be carried out once a year. In addition, animals in poor condition should be treated to prevent severe losses, especially in high prevalence areas or where strategic treatment was missed. Problems of liver fluke control include the lack of knowledge about the parasite at farmers level and the lack of availability of drug supplies at the village level, both of which are important to allow strategic treatment of animals [10]. In developed countries data on various aspects of helminthiasis are published in an efficient manner as

an aid to combat infection more effectively. In contrast, in undeveloping countries little information are published particularly data on the epidemiological aspect of helminthic infections as fascioliasis. Although some work has been carried from Jammu and Kashmir region but no work has been done on fascioliasis of cattle in the study area. So the aim of the current research was to record the prevalence of fascioliasis in cattle in the Ladakh (J&K) in relation to climatic factors, host age, sex and agro ecology of the region and help an attempt to bridge the gap in knowledge of these aspects to facilitate control of such infectious disease.

MATERIALS AND METHODS

Survey Of Fascioliasis In Slaughter Houses: A number of 70 cattle at slaughterhouses were examined to record the prevalence of the disease in a systematic survey of various slaughter houses. It was carried by visiting the abattoirs at weekly intervals during the study. Post-mortem examinations of slaughtered animals were carried out and livers were checked out for the presence of flukes. The date, age, sex and locality were recorded. The numbers of total and infected animals were also recorded.

Survey Of Fascioliasis In Household And Farm Cattle: During the study year, 65 household and 73 farm cattle were examined. Epidemiological and helminthological studies were performed at livestock farms and on household cattle in both districts of the study area. During the study, seasonal prevalence was recorded. For this purpose the year was divided into two seasons as follows: wet and dry season. The prevalence in relation to age, sex and agro-ecology was also recorded.

Identification of Liver Flukes And Egg Count: The recovered liver flukes during the survey in slaughter houses were counted and morphologically identified as *Fasciola hepatica* and *Fasciola gigantica* according to [11]. Fecal samples were examined by flotation and sedimentation techniques for the presence of fluke eggs [11]. Egg count was performed by McMaster egg counting technique [11]. Identification was done on the basis of morphology [11].

Climatic Data: The climatic data was provided by Government Meteorological Department of Ladakh.

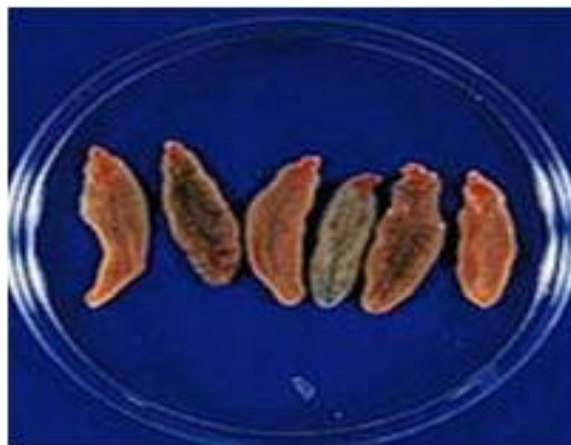


Fig. 1: The collected *Fasciola* worms from the slaughter house cattle

RESULTS

During the study year, 70 cattle at slaughterhouses, 65 household and 73 farm cattle were examined of which 36 (51.42%) of slaughtered, 18 (27.69%) of farm cattle and 16 (21.91%) of the household cattle were found to be infected with either one of the two species of *Fasciola* viz; *Fasciola hepatica* or *Fasciola gigantica* or some times with both species. It was also noticed that *Fasciola gigantica* was predominant over *Fasciola hepatica*. Overall infection rate was 70 (33.65%). It was noticed that prevalence was higher in cattle at slaughterhouses (51.42%) followed by farm cattle (27.69%) and household cattle (21.91%) respectively (Table 1 and Figure 1).

In all cattle, the overall recorded prevalence was higher during wet season (45.19%) as compared to the dry season (24.40%), (Table 2). A positive correlation of disease prevalence to minimum temperature, morning and evening humidity and rainfall has been recorded. Correlation between disease prevalence and other meteorological factors was not significant.

The occurrence of fascioliasis was more frequently recorded in younger cattle (40.02%) than in adult ones (28.04%) which were above two years of age (Table 3). Similarly significant differences were found in infection rate with regard to the host sex; females were more infected (38.07%) as compared to males (29.09%) (Table 4).

Furthermore the present study also revealed a correlation of disease prevalence with agro-ecology of the study area; the prevalence was high (37.14%) in low land areas (Kargil) compared to a comparatively high altitude (Leh) (30.09%) (Table 5).

Table 1: Prevalence of fascioliasis in cattle

Cattle	No. examined	No. Positive	Percentage (%)
Slaughter house	70	36	51.42
Farm cattle	73	16	27.69
Household	65	18	21.91
Total	208	70	33.65

Table 2: Seasonal prevalence (%) of fascioliasis in cattle

Season	No. Examined	No. Positive	Percentage (%)
Wet	104	46	45.19
Dry	104	24	24.40
Overall	208	70	33.65

Table 3: The prevalence of fascioliasis in relation to cattle age factor

Age	No. Examined	No. Positive	Percentage (%)
Young (0- 2 years)	92	37	40.02
Adult (3-8 years)	116	33	28.04
Overall	208	70	33.65

Table 4: The prevalence of fascioliasis in relation to cattle sex factor

Sex	No. Examined	No. Positive	Percentage (%)
Males	110	38	29.79
Females	98	32	38.07
Overall	208	70	33.65

Table 5: Prevalence in relation to Agro-ecology

Agro-ecology	No. Examined	No. Positive	Percentage (%)
Low-land	105	39	37.14
High-altitude	103	31	30.09
Overall	208	70	33.65

DISCUSSION

A simple approach to estimate the national impact of fasciolosis is to estimate prevalence in different systems and determine the loss caused by infestation per animal per year. Prevalence may vary from 0% to 100% over a comparatively short distance [12]. The occurrence of fascioliasis in an area is influenced by a multifactorial system which comprises hosts, parasite and environmental effects. Therefore, the national prevalence may cover certain areas of high risk and high prevalence and hence loss.

In the present study, a higher prevalence of fascioliasis was observed in the three groups of cattle during wet season as compared to dry season. The higher prevalence in wet season than dry season is in agreement with many reports around the world [13 - 17]. This could be due to the existence of a direct relationship between prevalence with the rainfall, humidity and temperature. In this study, the presence of sufficient rainfall and moisture during the wet season favored the survival of infective larvae in the pasture, emergence of cercaria

from snails which results in higher probability of uptake of the infective larvae leading to higher prevalence rate [18].

The study further reveals that animals sex showed an association with the prevalence of the parasites, it was observed that females were more infected than their counter partners this is in consistent with Dhar *et al.* [19]; Fatima *et al.* [20]. This could be due to the physiological peculiarities of female animals, which usually constitute stress factors thus, reducing their immunity to infections and for being lactating mothers. Females are usually weak and malnourished and consequently are more susceptible to infections besides some other reasons [21].

Similarly, a higher prevalence rate recorded in younger animals as compared to adult ones is in agreement with Firreria *et al.* [16]; Shah-Fischer and Say, [22]; Kiyuu [23]; Nganga *et al.* [24] from different countries of the world. 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 [22, 25].

The study also shows higher prevalence in Kargil district which is comparatively lowland as compared to Leh (high altitudes) this statement is in line with reports from many parts of world [26-28]. These low lands are characterized by a comparatively hot humid environmental situation that is favorable for the survival of the infective larval stage of these parasites.

CONCLUSION

It is evident from the study that comprehensive data on the impact of fasciolosis over several years are difficult and expensive to obtain. This is due mostly to the long-term and chronic nature of the disease, its multiple effects on productivity and the difficulty of making an accurate diagnosis. Fascioliasis devastates cattle throughout the world and continually drains the economic gains from these animals as is the case of Ladakh. Therefore, concerted efforts should be made to overcome this loss.

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